BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1101 **Time: 2 Hours**

Course Name: HANDSKILLS AND FITTING **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. While using hacksaw which stroke is a cutting stroke?

(a) upward (c) forward

(b) downward (d) backward

Q2. Which tool is most suitably used for scribing a circle?

(a) divider (c) Vernier caliper

(b) scriber (d) pencil

Q3. What happens if the size of clearance angle / relief angle becomes very less?

a) The friction will be more and the surface quality will be bad

b) Chips will break very easily

c) Tool will penetrate deeper

d) None of the above

Q4. Which tool is not a marking or scribing tool?

(a) Try square (C) Punch

(b) Divider (D) Vernier Caliper

Q5. What it sawing with large tooth spacing?

(a) Aluminum (b) Stainless steel

(c) Mild steel (d) Cast iron

Q6. Which material do you file with a single cut file?

(a) Mild steel (c) Stainless steel

(b) Tool steel (d) Tin

Q7. To avoid sticking of chips in file which lubricant we use

(a) water
(b) grease
(c) chalk
(d) coolant

Q8. Which instrument used for punching?

(a) scriber
(b) marking gauge
(c) Vernier calliper
(d) centre punch

Q9. Which type of file is used for making guide way for sawing?

(a) Flat file
(b) Semi round file
(c) round file
(d) triangular file

Q10. What is the application of the anvil plate?

a) To support the work piece for scribing
b) To use as a base plate
c) To measure the angle
d) None of the above

Section – B

04×04 = 16 Marks

Q11. Write the necessary points while scribing and Centre punching.

Q12. Write work plan for making a radius of 10mm on an aluminum workpiece

Q13. Why do you scribe Aluminum with a Pencil or a felt tip pen?

Q14. Write safety precautions while using sawing.

Section – C

04×06 = 24 Marks

Q15. Explain how you should clean a file properly with diagram.

Q16. Describe different types of files and their uses.

Q17. Explain the term counter bore and countersink.

Q18 .Write the short notes on following:

(a.) Deburring (b.) Scribing (c.) Reference plane

AS Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Answer key

Course Code: MCS1101 **Time: 2 Hours**

Course Name: HANDSKILLS AND FITTING **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. While using hacksaw which stroke is a cutting stroke?

(a) upward **(c) forward**

(b) downward (d) backward

Q2. Which tool is most suitably used for scribing a circle?

(a) **divider** (c) Vernier caliper

(b) scriber (d) pencil

Q3. What happens if the size of clearance angle / relief angle becomes very less?

a) The friction will be more and the surface quality will be bad

b) Chips will break very easily

c) Tool will penetrate deeper

d) None of the above

Q4. Which tool is not a marking or scribing tool?

(a) Try square (C) Punch

(b) Divider (D) **Vernier Caliper**

Q5. What it sawing with large tooth spacing?

(a) **Aluminum** (b) Stainless steel

(c) Mild steel (d) Cast iron

Q6. Which material do you file with a single cut file?

(a) Mild steel (c) Stainless steel

(b) Tool steel (d) **Tin**

Q7. To avoid sticking of chips in file which lubricant we use

(a) water (c) **chalk**

(b) grease (d) coolant

Q8. Which instrument used for punching?

(a) scriber (c) Vernier calliper

(b) marking gauge (d) **centre punch**

Q9. Which type of file is used for making guide way for sawing?

(a) Flat file (c) round file

(b) Semi round file (d) **triangular file**

Q10. What is the application of the anvil plate?

a) To support the work piece for scribing

b) To use as a base plate

c) To measure the angle

d) None of the above

Section – B

04×04 = 16 Marks

Q11. Write the necessary points while scribing and Centre punching.

Ans. Always wear safety glasses

- Keep the other tip of scriber covered while using it
- Always covered the scriber after using it
- always tilt the scriber so that it reaches the bottom edge of gauge
- scribing should be done once

Centre punch

- make 60-degree angle from base plate to match the center point
- always match the exact Centre
- always punch on a base plate
- avoid vibrations

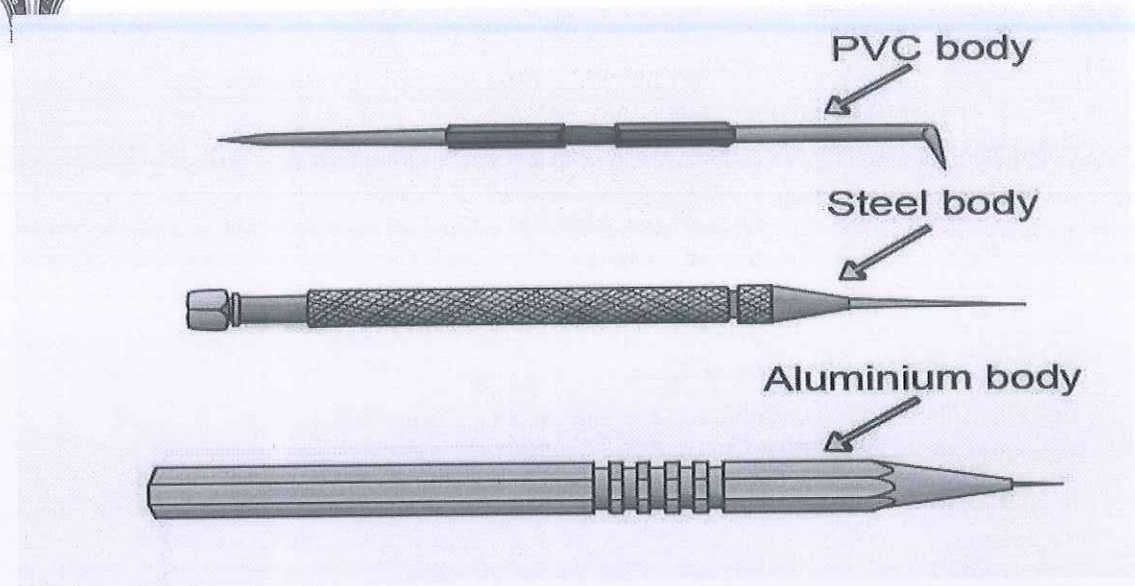
Q12. Write work plan for making a radius of 10mm on an aluminum workpiece

Ans. Work plan

- Material checking
- Deburring
- Sizing (measurement by measuring tool)
- Filing (file)
- Clamping
- Scribing (scriber)- scribing all lines with all dimensions
- Punching (centre punch)- on base plate
- Checking

Q13. Why do you scribe Aluminum with a Pencil or a felt tip pen?

Ans. When marking with a "hard" steel needle, fine cracks may appear in the soft material. The material can break during further processing like bending of sheets.



Q14. Write safety precautions while using sawing.

Ans. Wearing safety glasses (when using machines)

Short and safe clamping of work pieces

Clamp saw blade tight and straight

Do not use finger as guide when sawing

Do not blow away sawdust

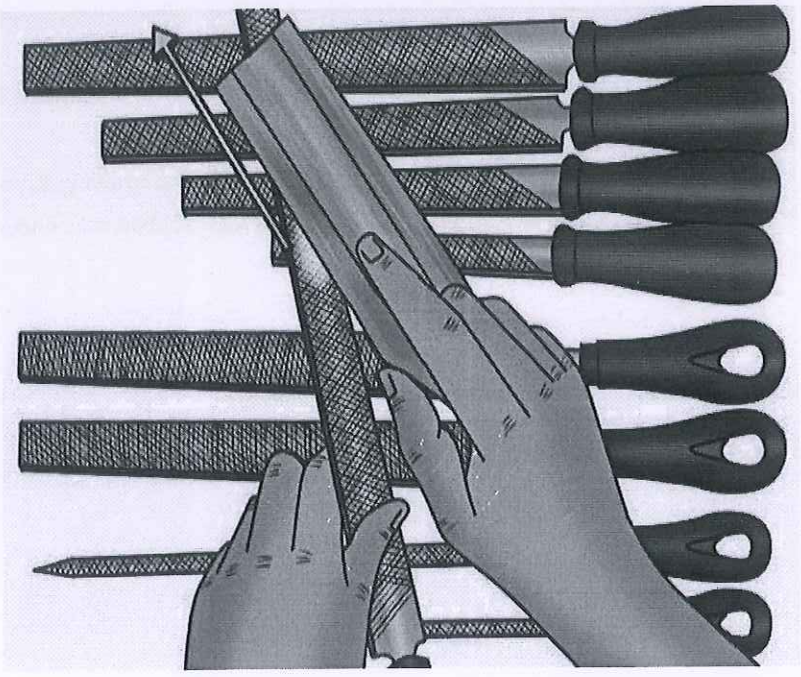
Section – C

04×06 = 24 Marks

Q15. Explain how you should clean a file properly with diagram.

Ans. Use a fille brush to clean the file.

Traces of chips left behind which cannot be removed with a file brush are removed with a file cleaner (brass or copper sheet) working in the direction of the overcut.



Q16. Describe different types of files and their uses.

Ans. FILES – **depends on shapes:**

Triangular file - used for making way while sawing, used for filing triangular surfaces, for removing metal from center of surfaces.

Semi round – for filing semi round surfaces, for filing arcs.

Flat file – for filing flat surfaces, for making chamfers

Square file – for removing small metal surface from little corners where flat files are not accessible

Round file – for filing fully round surfaces.

Half round file - for filing on semicircular or any arc shape workpiece

Also depending upon pitch:

Coarse pitch – files whose teeth has higher pitch and removes much material, having large surface roughness

Medium pitch – whose surface roughness is lower than coarse file, having medium pitch between teeth.

Fine pitch - Whose surface roughness is low, very fine pitch, used for finishing purpose.

Q17. Explain the term counter bore and countersink.

Ans. Counter bore – it is a cylindrical flat bottom hole profile that enlarges the coaxial hole.

Tool used for counter bore is called counter boring tool. First we have to drill a suitable hole for that. Typically used when a fasteners like socket head cap screw is required to sit flush with or below level of workpiece.

Counter sink – it is a conical hole cut into a workpiece, used to provide support or seat for fasteners below the level of workpiece.

Q18 .Write the short notes on following:

a) Deburring b) scribing c) Reference plane

Ans.

a) Deburring- removing small amount of metals from edges to make them smooth for safety with the help of files. Always use the process similar like chamfer.
b) Scribing- Scribing refers to the transferring the contours and dimensions onto the wok piece to be processed.
c) Reference plane-Reference plane is the plane on the behalf of it, all the drawing dimensions are measured. The point at which two reference plane intersect, is called reference point.

Verified

Q.P. Set. B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1101 Set-B **Time: 2 Hours**

Course Name: HANDSKILLS AND FITTING **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. To avoid sticking of chips in file which lubricant we use

(a) water (c) chalk

(b) grease (d) coolant

Q2. Which instrument used for scribing?

(a) scriber (c) Vernier calliper

(b) marking gauge (d) centre punch

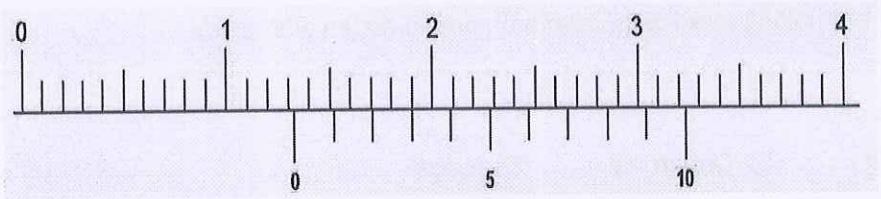
Q3. While using hacksaw which stroke is a cutting stroke?

(a) upward (c) forward

(b) downward (d) backward

Q4. Which measurement can you read?

Tenth Vernier



(a) 19.0mm (c) 133.0mm

(b) 13.3mm (d) 3.0mm

Q5. Which tool is most suitably used for scribing a circle?

(a) divider (c) Vernier caliper

(b) scriber (d) pencil

Q6. Which type of file is used for making guide way for sawing?

(a) Flat file (c) round file

(b) Semi round file (d) triangular file

Q7. Which part does not belong to a file?

(c) Tang
(d) Blade
(c) Bow
(d) Heel

Q8. Which instrument used for punching?

(a) scriber
(b) marking gauge
(c) Vernier calliper
(d) centre punch

Q9. What is the application of the anvil plate?

a) To support the work piece for scribing
b) To use as a base plate
c) To measure the angle
d) None of the above

Q10. Which file type is not available?

(a) Type E half round file
(b) Type H oval file
(c) Type D round file
(d) Type A flat hand file

Section – B

04×04 = 16 Marks

Q11. Explain the term counter bore and countersink.

Q12. Write 3 different types of scriber?

Q13. Write down the process for the making chamfer.

Q14. Write safety precautions while using sawing.

Section – C

04×06 = 24 Marks

Q15. Write the necessary points while scribing and Centre punching.

Q16. Write work plan for making a radius of 10mm on an aluminum workpiece

Q17. Write short note on

a) Least count
b) Deburring
c) Hinge

Q18. List six different equipment's used in hand skills with their uses.

A.S Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1101 Answer key **Time: 2 Hours**

Course Name: HANDSKILLS AND FITTING **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. To avoid sticking of chips in file which lubricant we use

(a) water (c) **chalk**

(b) grease (d) coolant

Q2. Which instrument used for scribing?

(a) **scriber** (c) Vernier calliper

(b) marking gauge (d) centre punch

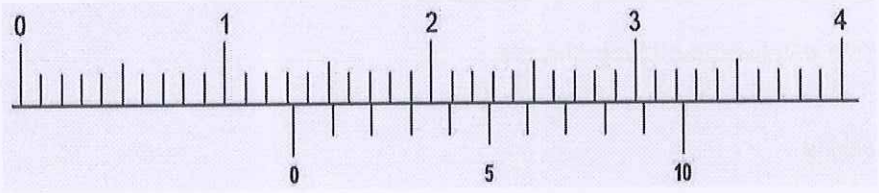
Q3. While using hacksaw which stroke is a cutting stroke?

(a) upward (c) **forward**

(b) downward (d) backward

Q4. Which measurement can you read?

Tenth Vernier



(a) 19.0mm (c) 133.0mm

(b) **13.3mm** (d) 3.0mm

Q5. Which tool is most suitably used for scribing a circle?

(a) **divider** (c) Vernier caliper

(b) scriber (d) pencil

Q6. Which type of file is used for making guide way for sawing?

(a) Flat file (c) round file

(b) Semi round file (d) **triangular file**

Q7. Which part does not belong to a file?

(c) Tang
(d) Blade
(c) **Bow**
(d) Heel

Q8. Which instrument used for punching?

(a) scriber
(b) marking gauge
(c) Vernier calliper
(d) **centre punch**

Q9. What is the application of the anvil plate?

a) To support the work piece for scribing
b) To use as a base plate
c) To measure the angle
d) None of the above

Q10. Which file type is not available?

(a) Type E half round file
(b) **Type H oval file**
(c) Type D round file
(d) Type A flat hand file

Section – B

04×04 = 16 Marks

Q11. Explain the term counter bore and countersink.

Ans. Counter bore – it is a cylindrical flat bottom hole profile that enlarges the coaxial hole.
Tool used for counter bore is called counter boring tool. First we have to drill a suitable hole for that. Typically used when a fasteners like socket head cap screw is required to sit flush with or below level of workpiece.
Counter sink – it is a conical hole cut into a workpiece, used to provide support or seat for fasteners below the level of workpiece.

Q12. Write 3 different types of scriber?

Ans. 1. Scriber- portable, can easily scribe any profile manually mostly used for straight lines.
2. Caliper-Whose one end is fixed and can scribe from another end used for flat surfaces.
3. Divider – used for circular scribing, we have to set the radius manually.

Q13. Write down the process for the making chamfer.

Ans: Chamfer

- Material checking
- Deburring
- Sizing
- Scribing
- Punching
- Clamping the workpiece at 45 degree
- Filing
- Finishing
- Measuring

Q14. Write safety precautions while using sawing.

Ans. Occupational safety during sawing –

a) Clamp the work piece firmly in the vise.
b) Prevent the saw from slipping off the work piece by filing a notch.
c) Shortly before separation of the work piece, reduce the cutting pressure.
d) Don't remove saw chips with fingers.

Deburring the work piece after sawing

Section – C

04×06 = 24 Marks

Q15. Write the necessary points while scribing and Centre punching.

Ans. Scribing

- Always wear safety glasses
- Keep the other tip of scriber covered while using it
- Always covered the scriber after using it
- always tilt the scriber so that it reaches the bottom edge of gauge
- scribing should be done once

Centre punch

- make 60 degree angle from base plate to match the center point
- always match the exact Centre
- always punch on a base plate
- avoid vibrations

Q16. Write work plan for making a radius of 10mm on an aluminum workpiece

Ans. **Radius**

- Material checking
- Deburring
- Sizing
- Radius calculation (0.6r)- 0.6*10= 6mm
- Scribing 10mm from both corners and 6mm for chamfer
- punching
- filing for chamfer
- dividing chamfers
- filing for radius in see saw motion
- checking by light gap method
- finishing

Q17. Write short note on

a) Least count b) Deburring c) Hinge

Ans.

a) Least count – it is the smallest possible value measured by same instrument.

Can be calculate by the formula

Value of one main scale division

Least count = ----------

Total no. of Vernier scale division

b) Deburring- removing small amount of metals from edges to make them smooth for safety with the help of files. Always use the process similar like chamfer.

c) Hinge – a movable joint or mechanism on which a door, gate or lid swings as it opens and closes or which connects linked objects.

Q18. List six different equipment's used in hand skills with their uses.

Ans. 1. Scriber - A scriber is a hand tool used in metal work to mark lines on work pieces, prior to machining. The process of using a scriber is called scribing and is just part of the process of marking out.

2. Hacksaw - A hacksaw is a fine-toothed saw, originally and mainly made for cutting metal. The equivalent saw for cutting wood is usually called a bow saw.

3. Center punch - A center punch is used to mark the center of a point. It is usually used to mark the center of a hole when drilling holes.

4. Marking gauge - A marking gauge, also known as a scratch gauge, is used in woodworking and metalworking to mark out lines for cutting or other operations. The purpose of the gauge is to scribe a line parallel to a reference edge or surface. It is used in joinery and sheet metal operations.

5. Radius gauge - A radius gauge, also known as a fillet gauge, is a tool used to measure the radius of an object. It require a bright light behind the object to be measured. The gauge is placed against the edge to be checked and any light leakage between the blade and edge indicates a mismatch that requires correction.

6. File – It is a tool used to remove fine amounts of material from a workpiece. It is common in woodworking, metalworking, and other similar trade and hobby tasks. Most are hand tools, made of a case hardened steel bar of rectangular, square, triangular, or round cross-section, with one or more surfaces cut with sharp, generally parallel teeth. A narrow, pointed tang is common at one end, to which a handle may be fitted

(Can write many others at least six)

Verified

Q1 Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester

End-Sem. Examination

Course Code: MCS1102 Set-A **Time: 2 Hours**

Course Name: Measuring **Max. Marks: 50**

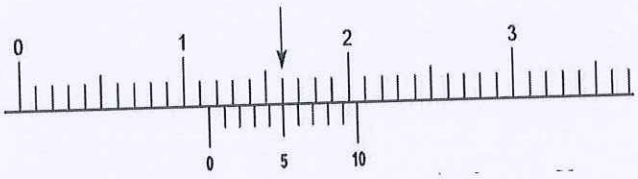
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

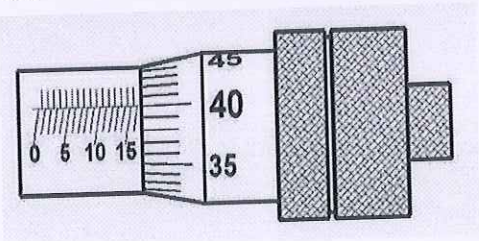
10X01 = 10 Marks

Q1. Which measurement can you read?



(a) 11.9mm
(b) 11.04mm
(c) 11.5mm
(d) 12.5mm

Q2. Which measurement can you read?



(a) 15.0mm
(b) 16.9mm
(c) 16.40mm
(d) 17.4mm

Q3. Radius gauge is type of

a) Form gauge.
b) Limit gauge.
c) Dimensional gauge
d) Both form and limit gauge.

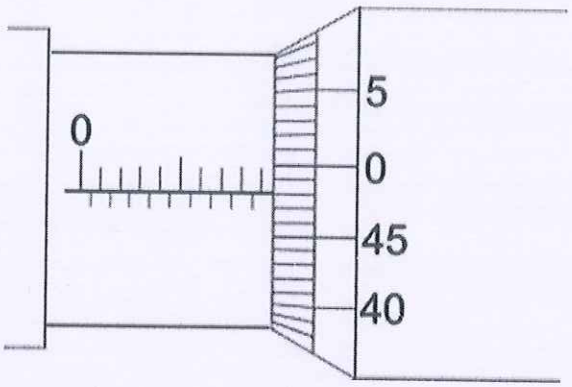
Q4. Which tool is a gauge?

(a) Bevel angle
(b) Protractor
(c) Punch
(d) Vernier Caliper

Q5. With which tool can be measured 12.5+/-0.3?

(a) Steel ruler
(b) Micrometer gauge
(c) Tape measure
(d) Folding rule

Q6. What is the reading as shown in the figure below?

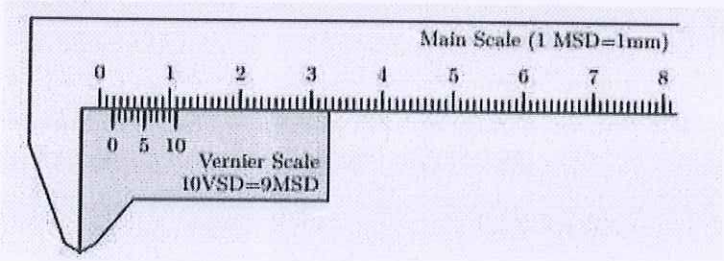


a) 9.7 mm
b) 9.02 mm
c) 9.48 mm
d) 8.47 mm

Q7 Material of a measuring tool should be.

a) Softer than the work piece.
b) Harder than the work piece.
c) Same hardness as of work piece
d) None of the above.

Q8. The jaws of the Vernier calipers shown in figure 8 are in contact with each other. Find the zero error of this Vernier calipers.



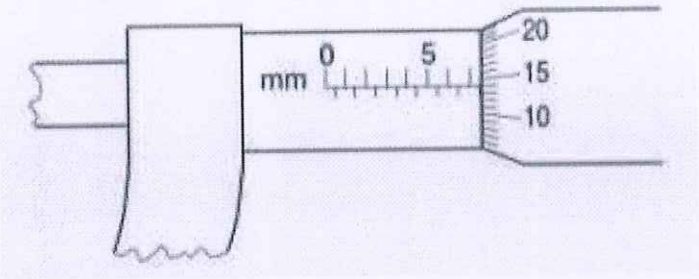
a) 2.9 mm
b) 0.8 mm
c) 1.5 mm

d) 1.9 mm

Q9. The smallest value that can be measured by the measuring instrument is called its

(a) accuracy
(b) tolerance
(c) least count
(d) error

Q10. The diagram shows a micrometer scale.



What is the reading shown on the micrometer scale?

a) 7.14 cm
b) 7.14mm
c) 7.64 mm
d) 7.16 mm

Section – B

04X04 = 16 Marks

Q11. Explain direct and indirect testing.

Q12. Name 8 different measuring instruments/gauges

Q13. Write the difference between measuring instruments and gauges.

Q14 Calculate the least count of Vernier caliper which has 50 divisions on Vernier scale and also write its formula.

Section – C

04X06 = 24 Marks

Q15. Write down the measuring and gauging tools names (any 10, avoid to put those name which are already in previous question)

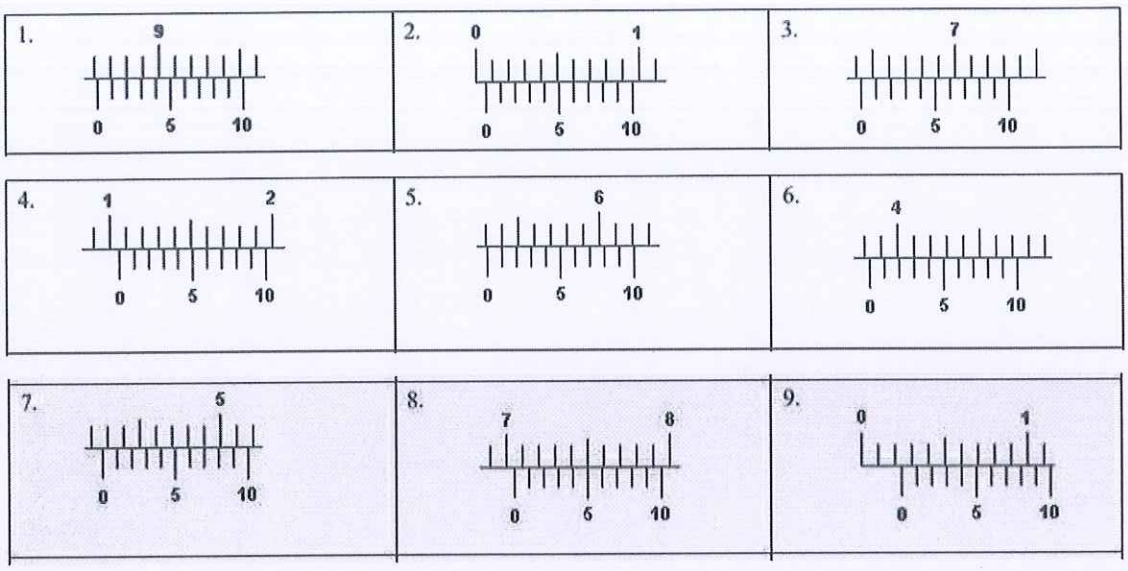
Q16. Write short note on measuring errors, why do we measure parts

17. Make labelled diagram of Vernier calliper or micrometre

Q18 Find the readings of the Vernier calipers below

→ Measuring Set-A, I-Semester, End-Sem.

Q18.



AS.Sol A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1102

Course Name: Measuring

Answer key

Time: 2 Hours

Max. Marks: 50

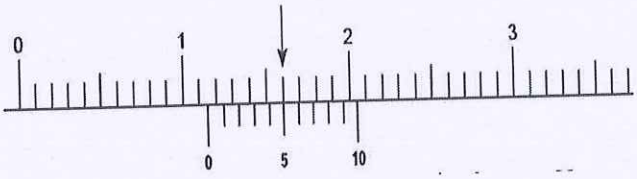
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. Which measurement can you read?



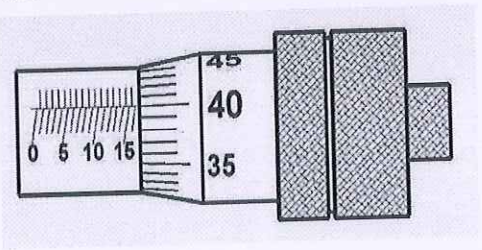
(a) 11.9mm

(b) 11.04mm

(c) 11.5mm

(d) 12.5mm

Q2. Which measurement can you read?



(a) 15.0mm

(b) 16.9mm

(c) 16.40mm

(d) 17.4mm

Q3. Radius gauge is type of

a) **Form gauge.**

b) Limit gauge.

c) Dimensional gauge

d) Both form and limit gauge.

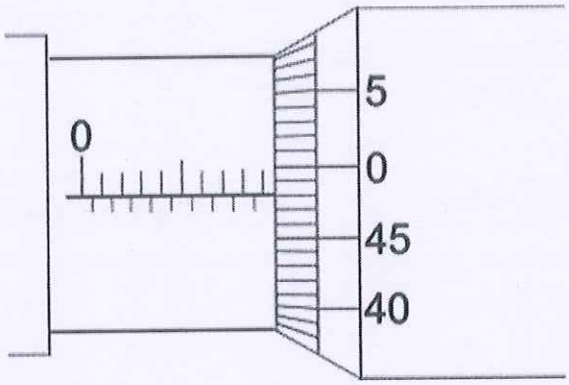
Q4. Which tool is a gauge?

(a) **Bevel angle**
(b) Protractor
(c) Punch
(d) Vernier Caliper

Q5. With which tool can be measured 12.5+/-0.3?

(a) Steel ruler
(b) **Micrometer gauge**
(c) Tape measure
(d) Folding rule

Q6. What is the reading as shown in the figure below?

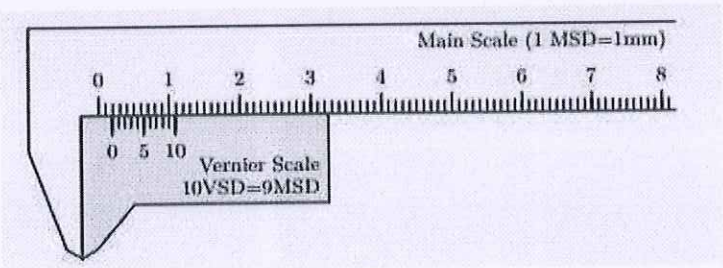


a) 9.7 mm
b) 9.02 mm
c) 9.48 mm
d) 8.47 mm

Q7 Material of a measuring tool should be.

a) Softer than the work piece.
b) Harder than the work piece.
c) Same hardness as of work piece
d) None of the above.

Q8. The jaws of the Vernier calipers shown in figure 8 are in contact with each other. Find the zero error of this Vernier calipers.



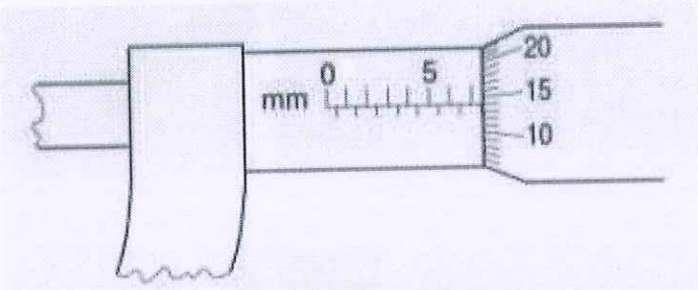
a) 2.9 mm
b) 0.8 mm
c) 1.5 mm

d) 1.9 mm

Q9. The smallest value that can be measured by the measuring instrument is called its

(a) accuracy
(b) tolerance
(c) **least count**
(d) error

Q10. The diagram shows a micrometer scale.



What is the reading shown on the micrometer scale?

a) 7.14 cm
b) 7.14mm
c) 7.64 mm
d) 7.16 mm

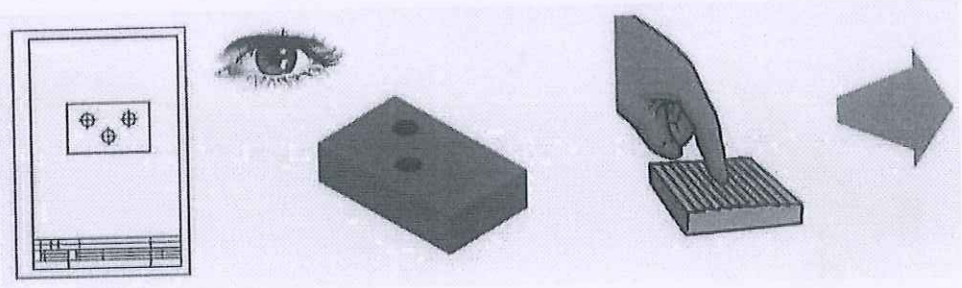
Section – B

04X04 = 16 Marks

Q11. Explain direct and indirect testing.

Ans. . **Subjective testing**

Subjective test methods lead to conclusions which can vary greatly from one tester to the next.



good/ bad

You can see, that at the work piece one rough
Hole is missing

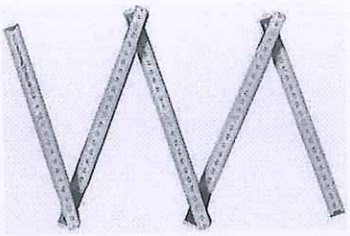
you can feel, that the surface is too

Objective testing

Objective test methods must produce results that always contain am measured value or a conclusion that is unequivocal. In other words, anyone carrying out the test using the same method must come to the same result.

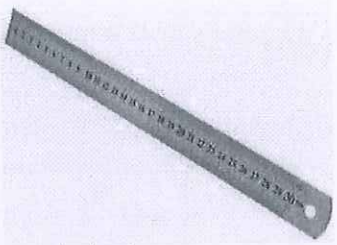
Q12. Name 8 different measuring instruments/gauges

Ans. 1.



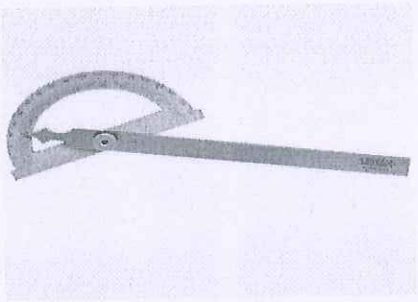
Folding rule

2.



steel ruler

3.



Protractor

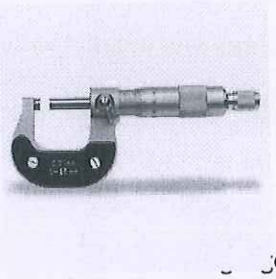
4.

Laser measure

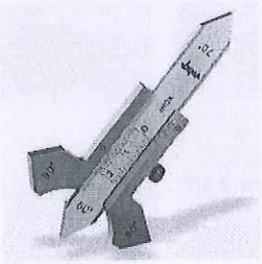
5.

Tape measure

6.

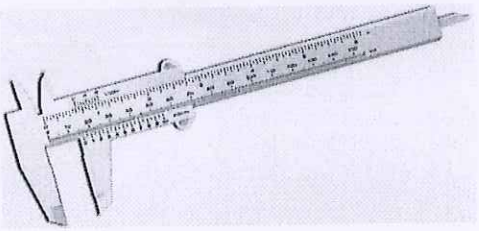


7



Welding gauge

8.



Vernier calliper

Q13. Write the difference between measuring instruments and gauges.

Ans

S.No.	Gauges	Measuring instruments
1.	Gauge are use to check the work piece	Instruments are use to measure the work piece

2.	This is used for mass production mainly	Instruments are use for inspection
3.	Gauges have fixed dimension or fixed Value	Instruments have variable dimension or value

Q14 Calculate the least count of Vernier caliper which has 50 divisions on vernier scale and also write its formula.

Ans:- **Formula:**

L.C = One values of smallest division on main scale / Total division on secondary scale

OR

L.C = Main scale division – Vernier scale division

Calculate least count:

L.C = 1 / 50 = 0.02mm

Or

L.C = 1 – 0.98 = 0.02mm

Section – C

04X06 = 24 Marks

Q15. Write down the measuring and gauging tools names (any 10, avoid to put those name which are already in previous question)

Ans. Measuring :- 1) hole test micrometer 2) veriner hight gauge 3) sheet gauge 4) radius gauge 5) marking gauge 6) thread ring gauge 7) thread plug gauge 8) filer gauge 9) snap gauge 10) bevel gauge.

Q16. Write short note on measuring errors, why do we measure parts

Ans. The parallelism of the measuring jaw of the vernier gauge is checked using the light gap method.

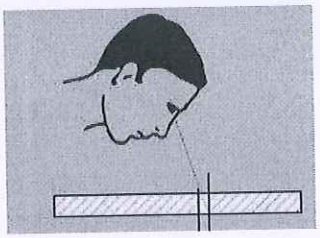
The accuracy of the measuring tools is dependent upon the reference temperature (20°C).

Workpieces/measuring depths must be clean and burr-free for measuring.

The measuring jaws must be directed as high as possible above the workpiece.

Do not tilt the vernier gauge during measuring.

Do not apply too much pressure when pressing the moving measuring jaw against the surface to be measured.



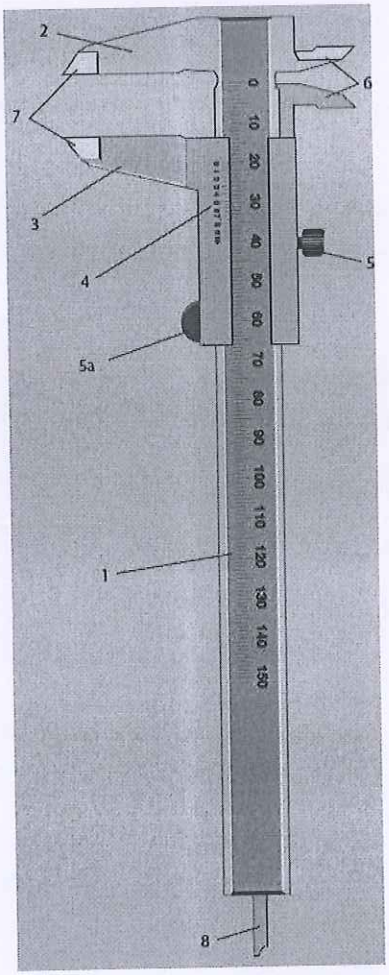
Look at the reading from above.

The vernier gauge is a precision measuring tool and must therefore be protected against soiling and damage.

-Reproducibility of parts
-Early detection of errors
-Guarantee the function of parts
-Reduce costs
-Reduce waste
-Reduce process time
-Safety

Q17. Make labelled diagram of Vernier calliper or micrometre

Ans. **Components of a Vernier Calliper**



Measurements with an accuracy of 0.1 mm or up to 0.05 mm can be read off from a vernier gauge.

1. The bar with the line graduation in millimetres
2. The fixed measuring jaw
3. The adjustable measuring jaw
4. The slide with Vernier graduation

5a. The retaining screw (type 1A)

5b. The clamp (type 2A)

6 The cutting areas for measuring internal dimensions

7. The measuring areas to measuring threads

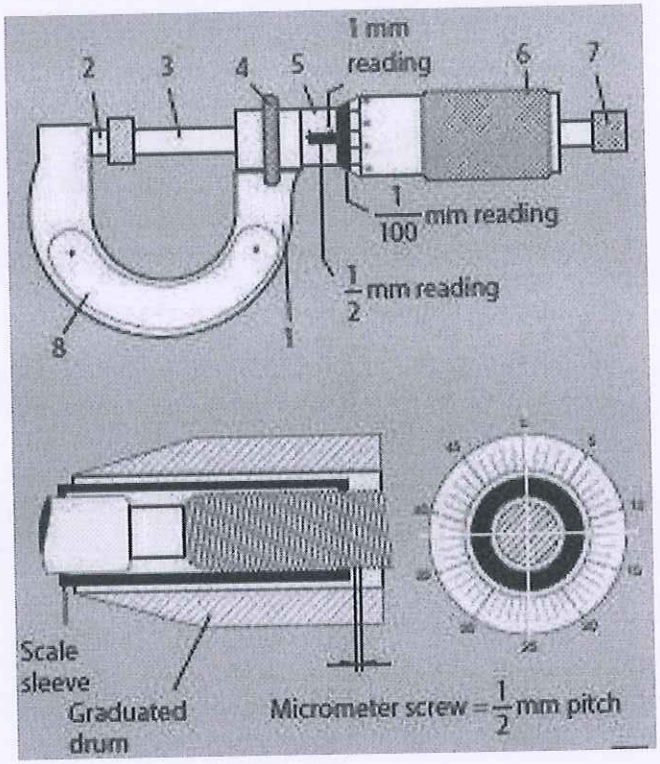
8. The depth measuring rod for measuring drill depths, groove depths and ridge heights

OR

Components of a micrometre gauge

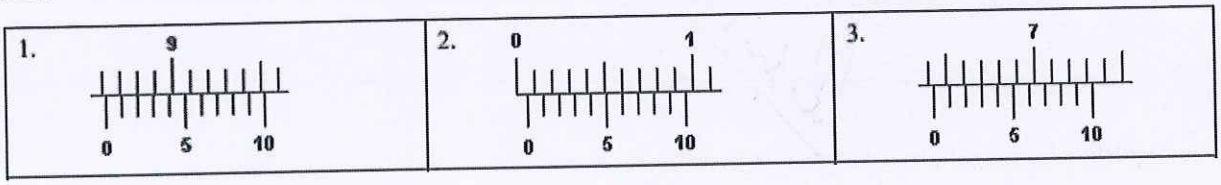
A micrometer gauge is used to measure external dimensions with a dimensional accuracy of 1/100 mm.

1. Bow (marked with measuring range)
2. Measuring pin (fixed end)
3. Micrometer screw
4. Retaining screw
5. Scale sleeve
6. Graduated drum (thimble)
7. Coupling (ratchet)
8. Plastic plates (thermal insulation Marked with measuring range)

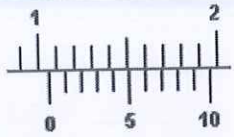
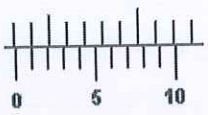
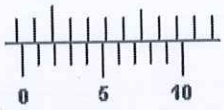
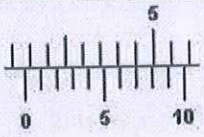
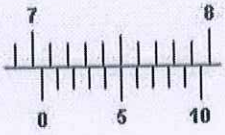
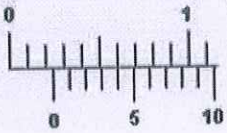


Q18 Find the readings of the vernier calipers below

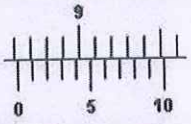
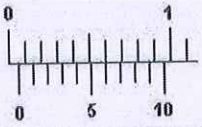
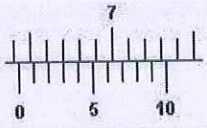
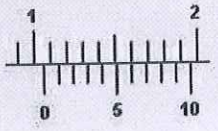
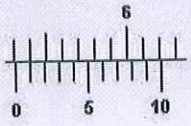
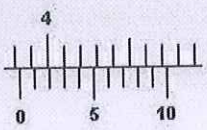
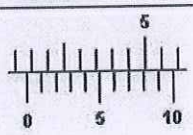
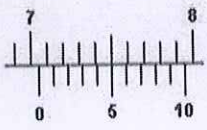
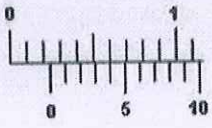
Ans.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

4. 	5. 	6. 
7. 	8. 	9. 

Ans.

1. 	2. 	3. 
8.6 cm + 0.02cm = 8.62cm	0.0cm + 0.06cm = 0.06cm	6.4cm + 0.03cm = 6.43cm
4. 	5. 	6. 
1.0cm + 0.06cm = 1.06cm	5.3cm + 0.01cm = 5.31cm	3.8cm + 0.03cm = 3.83cm
7. 	8. 	9. 
4.3cm + 0.07cm 4.37cm	7.0cm + 0.05cm 7.05cm	0.2cm + 0.04cm 0.24cm

Verified
Rishikesh

QP, Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester

End-Sem. Examination

Course Code: MCS1102 Set-B

Course Name: MEASURING

Time: 2 Hours

Max. Marks: 50

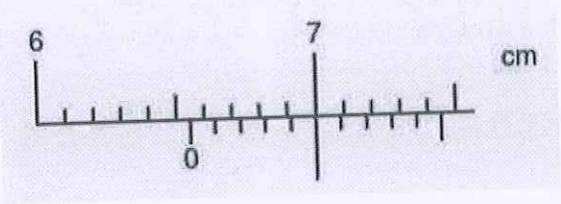
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

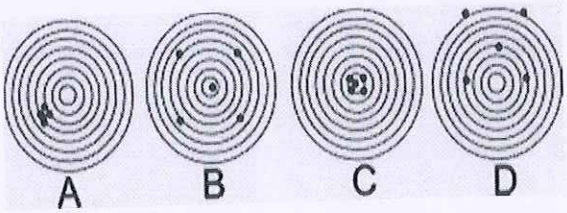
Q1.The diagram shows part of a Vernier scale.



What is the reading on the Vernier scale?

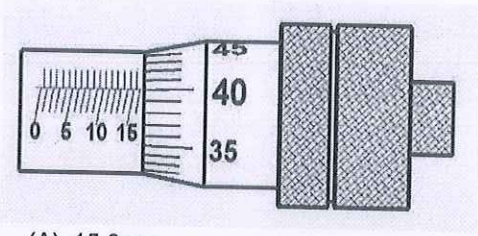
a) 6.50cm
b) 6.65 mm
c) 6.55 mm
d) 6.55 cm

Q2. Which of the following is precise, but not accurate?



a) A
b) B
c) C
d) D

Q3. Which measurement can you read?



(A) 15.0mm
(B) 16.9mm
(C) 16.40mm
(D) 17.4mm

Q4. Which part does not belong to a Vernier caliper?

(A) Measuring jaw
(B) The clamp
(C) Scale sleeve
(D) Depth measuring rod

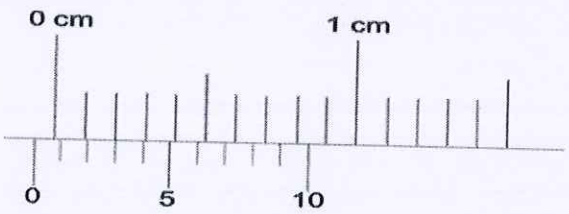
Q5. A workman measures, as accurately as possible, the length and internal diameter of a straight copper pipe.

The length is approximately 600 cm and the internal diameter is approximately 2 cm. What is the best combination of instruments for the workman to use?

	Internal Diameter	Length
A	Ruler	Ruler
B	Ruler	Tape
C	Vernier Calipers	Ruler
D	Vernier Calipers	Tape

a) A
b) B
c) C
d) D

Q6. What is the zero error as shown in the figure below?

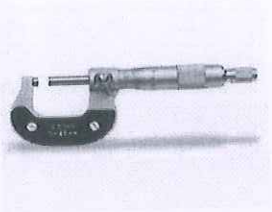


a) 0.7 mm
b) 0.3mm
c) -0.3mm
d) -0.7mm

Q7. Which tool is most suitably used for scribing a circle?

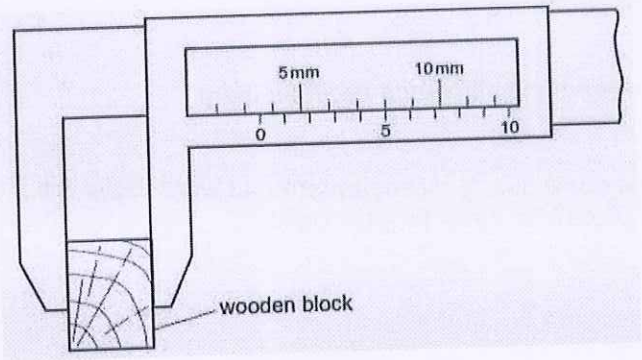
(a) divider
(b) scriber
(C) Vernier caliper
(D) pencil

Q8. Name the instrument



(A) divider
(b) Micrometer
(c) Vernier caliper
(d) protractor

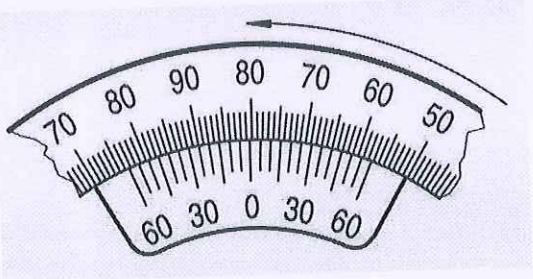
Q9. The width of a wooden block is measured using Vernier calipers.



What is the width of the block?

a) 8.0 mm
b) 8.5 mm
c) 3.5 mm
d) 4.5 mm

Q10. Read the measurement



(A) 78 degree 15 min.
(B) 81 degree 15 min.
(C) 80 degree 20 min.
(D) 81 degree 40 min.

Section – B

04×04 = 16 Marks

Q11. Write down the importance of measure parts?

Q12. Name 8 different measuring instruments/gauges

Q13. We measure a part. First measure =12.5mm/ second measure =12.6mm/ Third measure = 12.4mm. Which reasons could it have?

Q14. Which factors should we consider to select measuring tool?

Section – C

04×06 = 24 Marks

Q15. Explain subjective and objective testing.

Q16. Make labelled diagram of Vernier calliper or micrometre

Q17. Explain the terms measuring and gauging and difference between them

Q18. What is the importance of the temperature during measurement and what happen if a gauge be cooler or warmer than the Test piece? Reasons for your opinion.

A S, Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1102

Course Name: MEASURING

Answer key

Time: 2 Hours

Max. Marks: 50

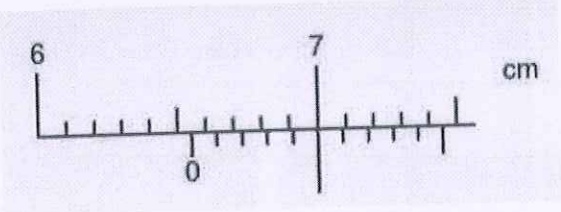
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

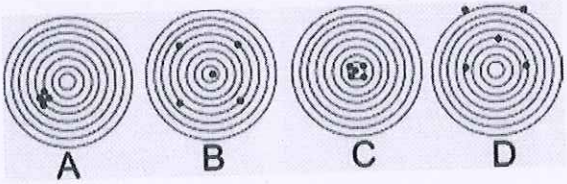
Q1.The diagram shows part of a vernier scale.



What is the reading on the vernier scale?

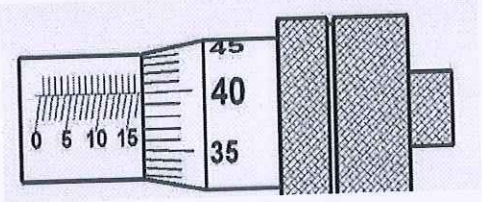
a) 6.50cm
b) 6.65 mm
c) 6.55 mm
d) 6.55 cm

Q2. Which of the following is precise, but not accurate?



a) A
b) B
c) C
d) D

Q3. Which measurement can you read?



(A) 15.0mm
(C) **16.40mm**
(B) 16.9mm
(D) 17.4mm

Q4. Which part does not belong to a Vernier caliper?

(A) Measuring jaw
(C) **Scale sleeve**
(B) The clamp
(D) Depth measuring rod

Q5. A workman measures, as accurately as possible, the length and internal diameter of a straight copper pipe.

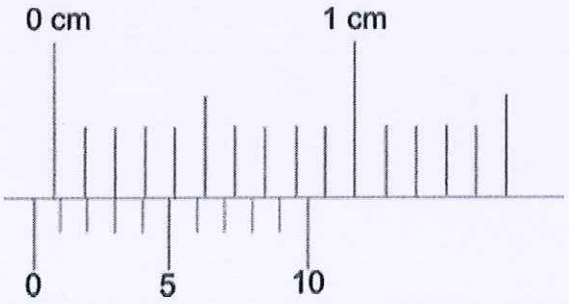
The length is approximately 600 cm and the internal diameter is approximately 2 cm.

What is the best combination of instruments for the workman to use?

	Internal Diameter	Length
A	Ruler	Ruler
B	Ruler	Tape
C	Vernier Calipers	Ruler
D	Vernier Calipers	Tape

a) A
b) B
c) C
d) D

Q6. What is the zero error as shown in the figure below?



a) 0.7 mm
b) 0.3mm
c) -0.3mm
d) -0.7mm

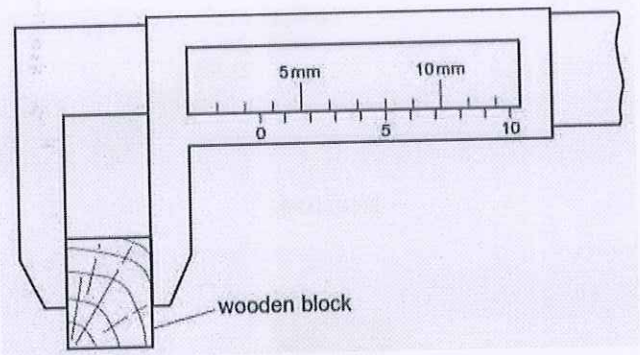
Q7. Which tool is most suitably used for scribing a circle?

(a) **divider**
(b) scriber
(C) Vernier caliper
(D) pencil

Q8. Name the instrument

(A) divider
(b) Micrometer
(c) Vernier caliper
(d) protractor

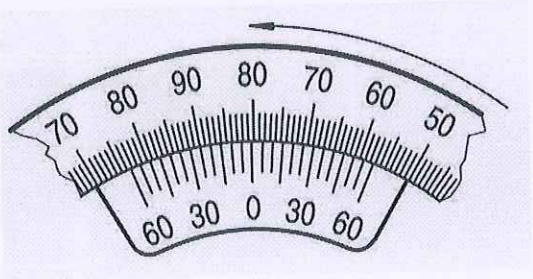
Q9. The width of a wooden block is measured using vernier calipers.



What is the width of the block?

a) 8.0 mm
b) 8.5 mm
c) 3.5 mm
d) 4.5 mm

Q10. Read the measurement



(A) 78 degree 15 min.
(B) 81 degree 15 min.
(C) **80 degree 20 min.**
(D) 81 degree 40 min.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – B

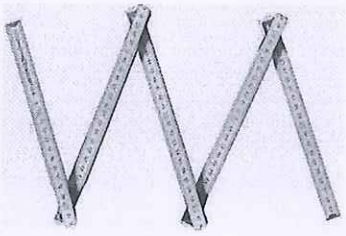
04×04 = 16 Marks

Q11. Write down the importance of measure parts?

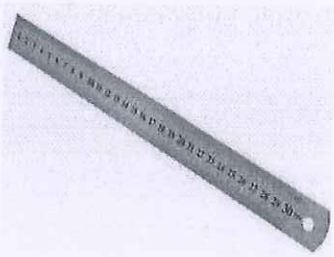
Ans. -Reproducibility of parts
-Early detection of errors
-Guarantee the function of parts
-Reduce costs
-Reduce waste
-Reduce process time
-Safety

Q12. Name 8 different measuring instruments/gauges

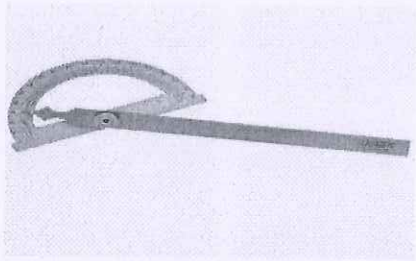
Ans.



Folding rule



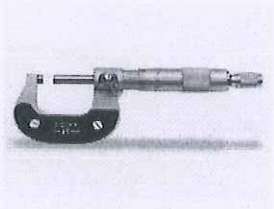
steel ruler



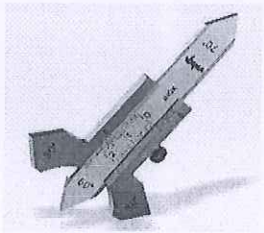
Protractor

Laser measure

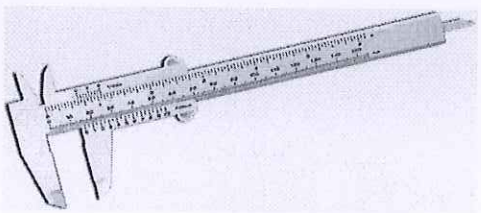
Tape measure



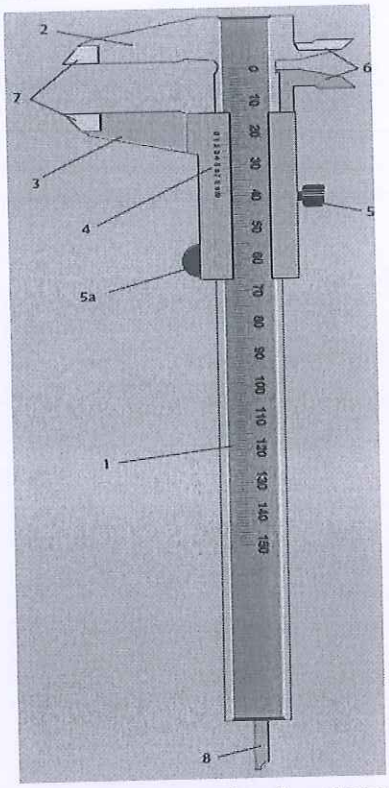
Micrometer gauge



Welding gauge



Vernier callipers



3. The adjustable measuring jaw

4. The slide with Vernier graduation

5a. The retaining screw (type 1A)

5b. The clamp (type 2A)

6 The cutting areas for measuring internal dimensions

7. The measuring areas to measuring threads

8. The depth measuring rod for measuring Drill depths, groove depths and Ridge heights

OR

Components of a micrometre gauge

A micrometer gauge is used to measure External dimensions with a dimensional Accuracy of 1/100 mm.

1. Bow (marked with measuring range)

2. Measuring pin (fixed end)

3. Micrometer screw

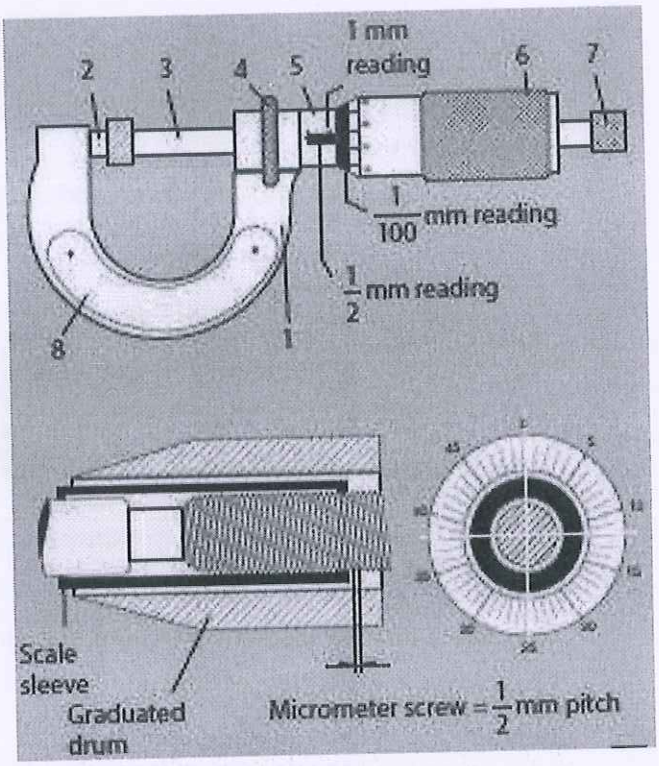
4. Retaining screw

5. Scale sleeve

6. Graduated drum (thimble)

7. Coupling (ratchet)

8. Plastic plates (thermal insulation Marked with measuring range)



Q13. We measure a part. First measure =12.5mm/ second measure =12.6mm/ Third measure = 12.4mm. Which reasons could it have?

Ans. - Wrong measure tools
- Different temperature
- Look at the reading from above
- Do not apply too much pressure when pressing the moving measuring Jaw against the surface to be measured
- The parallelism of the measuring jaw of the vernier gauge is checked using The light gap method.
- Work pieces/measuring depths must be clean and burr-free for measuring
- The measuring jaws must be directed as high as possible above the work piece.
- Do not tilt the vernier gauge during measuring.

Q14. Which factors should we consider to select measuring tool?

Ans:-

(1) Tolerances of given size

(2) Range of given dimension

(3) Availability of measuring instruments

(4) Time consumption in measurements

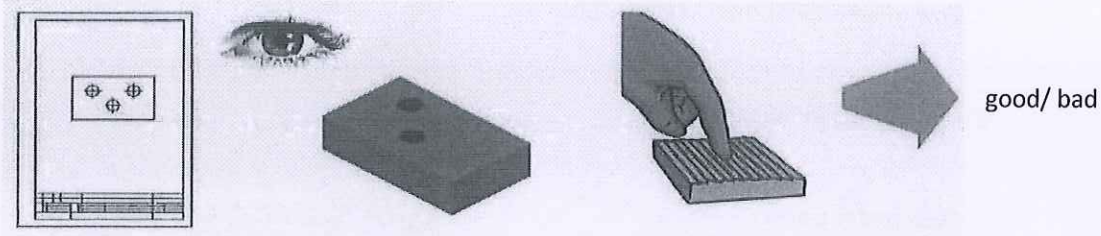
Section – C

04×06 = 24 Marks

Q15. Explain subjective and objective testing.

Ans. Subjective testing

Subjective test methods lead to conclusions which can vary greatly from one tester to the next.



You can see, that at the work piece one rough

you can feel, that the surface is too

Q16. Make labelled diagram of Vernier calliper or micrometre

Ans. Components of a Vernier Calliper

Measurements with an accuracy of 0.1 mm or up to 0.05 mm can be read off from a Vernier gauge.

1. The bar with the line graduation in millimetres

2. The fixed measuring jaw

Q17. Explain the terms measuring and gauging and difference between them

Ans. Measuring is the process by means of which a measured value is determined ba comparing a given size with a statutory unit of measure.

Gauging is the process of determining wheter specific lengths, angles or shapes of a test object comply with given dimensional or physical limits gauges or the direction in which these are exceeded. Gauging does not determine the extent of any deviation from these limits.

Measuring something gives it a numeric value, an actual size and unit.

Gauging something just makes sure that it is between tolerances without actually having to measure it.

Q18. What is the importance of the temperature during measurement and what happen if a gauge be cooler or warmer than the Test piece? Reasons for your opinion.

Ans. The parallelism of the measuring jaw of the vernier gauge is checked using the light gap method.

The accuracy of the measuring tools is dependent upon the reference temperature (20°C).

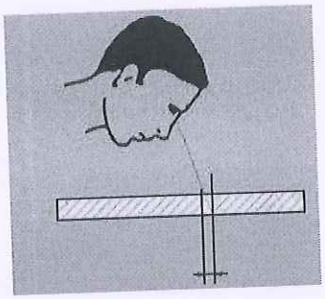
Work pieces/measuring depths must be clean and burr-free for measuring.

The measuring jaws must be directed as high as possible above the work piece.

Do not tilt the vernier gauge during measuring.

Do not apply too much pressure when pressing the moving measuring jaw against the surface to be measured.

Look at the reading from above.



Vetted
Rishikesh

OP Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Set A

Course Code: MCS1103 **Time: 2 Hours**

Course Name: Electrode welding (MMAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. What is the function of flux in manual metal arc welding?

a) To prevent weld contamination

b) To prevent oxidation of joint

c) Improves the arc stability

d) All of the above

Q2. Manual metal arc welding is used –

a) Consumable electrode

b) Non-consumable electrode

c) Both

d) None the above

Q3. The deflection of the arc in arc blow is by?

a) Electric field

b) Magnetic field

c) Combination of both

d) Hydrostatic field

Q4. Arc-welding uses following electric supply.....

a) A.C.

b) D.C.

c) Both AC and DC

d) Spiral waveform

Q5. Distortion in welding occurs due to.....

a) Use of excessive current
b) Improper clamping methods
c) Use of wrong electrodes
d) Oxidation of weld pool

Q6. In arc welding, the temperature of the arc is of the order of
a) 100° C
b) 1000° C
c) 3500° C
d) 35000° C

Q7. The Polarity of A.C welding sets is
a) Positive
b) Negative
c) No polarity
d) Infinite

Q8. As the thickness of the part to be welded increases, which of the following parameter for arc welding should also increase?
a) Voltage
b) Current
c) Frequency
d) All of the above

Q9. Arc blow is a welding defect which is encountered in
a) Arc welding using D.C current
b) Arc welding using A.C current
c) Gas welding
d) Thermit welding

Q10. Which of the following is not a welding accessory?
a) Electrode holder
b) Work Clamp
c) Cable
d) Gloves

Section – B

04X04 = 16 Marks

Q11. Define the following terms-

a) Hard facing

b) Buildup

Q12. Explain circumferential seam symbol and construction site seam symbol with diagram.

Q13. What are the functions of electrode covering?

Q14. Write the procedure for selecting an electrode.

Section – C

04X06 = 24 Marks

Q15. Describe the weld seam inspection procedure in detail, also draw the diagram if needed

Q16. Define the arc welding power source? And describe its type in detail

Q17. What is welding defects? Make the list of welding defects and its causes.

Q18. What is protective gear? Give the use of six protective gear.

Vetted
Rishikesh

AS. Sut A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1103 **Time: 2 Hours**

Course Name: Electrode welding (MMAW) Answer key **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. What is the function of flux in manual metal arc welding?

a) To prevent weld contamination

b) To prevent oxidation of joint

c) Improves the arc stability

d) All of the above

Ans. D

Q2. Manual metal arc welding is used –

a) Consumable electrode

b) Non-consumable electrode

c) Both

d) None the above

Ans. A

Q3. The deflection of the arc in arc blow is by?

a) Electric field

b) Magnetic field

c) Combination of both

d) Hydrostatic field

Ans. B

Q4. Arc-welding uses following electric supply.....

a) A.C.

b) D.C.

c) **Both AC and DC**

d) Spiral waveform

Ans. C

Q5. Distortion in welding occurs due to.....

a) Use of excessive current
b) Improper clamping methods
c) Use of wrong electrodes
d) Oxidation of weld pool

Ans. B

Q6. In arc welding, the temperature of the arc is of the order of
a) 100° C
b) 1000° C
c) 3500° C
d) 35000° C

Ans. C

Q7. The Polarity of A.C welding sets is
a) Positive
b) Negative
c) No polarity
d) Infinite

Ans. C

Q8. As the thickness of the part to be welded increases, which of the following parameter for arc welding should also increase?
a) Voltage
b) Current
c) Frequency
d) All of the above

Ans. B

Q9. Arc blow is a welding defect which is encountered in
a) Arc welding using D.C current
b) Arc welding using A.C current
c) Gas welding
d) Thermit welding

Ans. A

Q10. Which of the following is not a welding accessory?
a) Electrode holder
b) Work Clamp
c) Cable
d) Gloves

Ans. D

Section – B

04X04 = 16 Marks

Q11. Define the following terms-

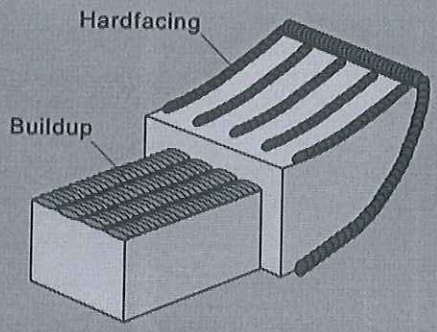
a) Hard facing

b) Buildup

Ans.

Joining 2

Welded Joints
Definition



Surfacing

In addition to connecting parts together, welding can also be used to apply simple filler metals to work piece surfaces.

Here, a distinction is made between building-up and hardfacing.

Building-up is used to surface worn areas with a filler metal whose characteristics are similar to the base metal.

Hardfacing, in contrast, is the application of a higher quality filler metal to places that must be especially well protected against wear and corrosion.

For example, on the tooth of this back hoe bucket.

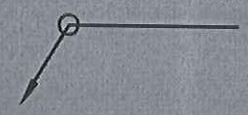
Q12. Explain circumferential seam symbol and construction site seam symbol with diagram.

Ans.

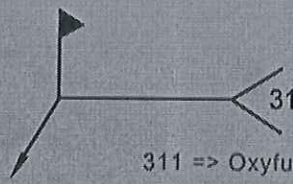
Joining 2

Welded Joints
Weld Seams

Circumferential Seam



Construction Site Seam



311 => Oxyfuel Gas Welding

Representation in Blue Prints

When necessary, additional information can be added to the reference symbol.

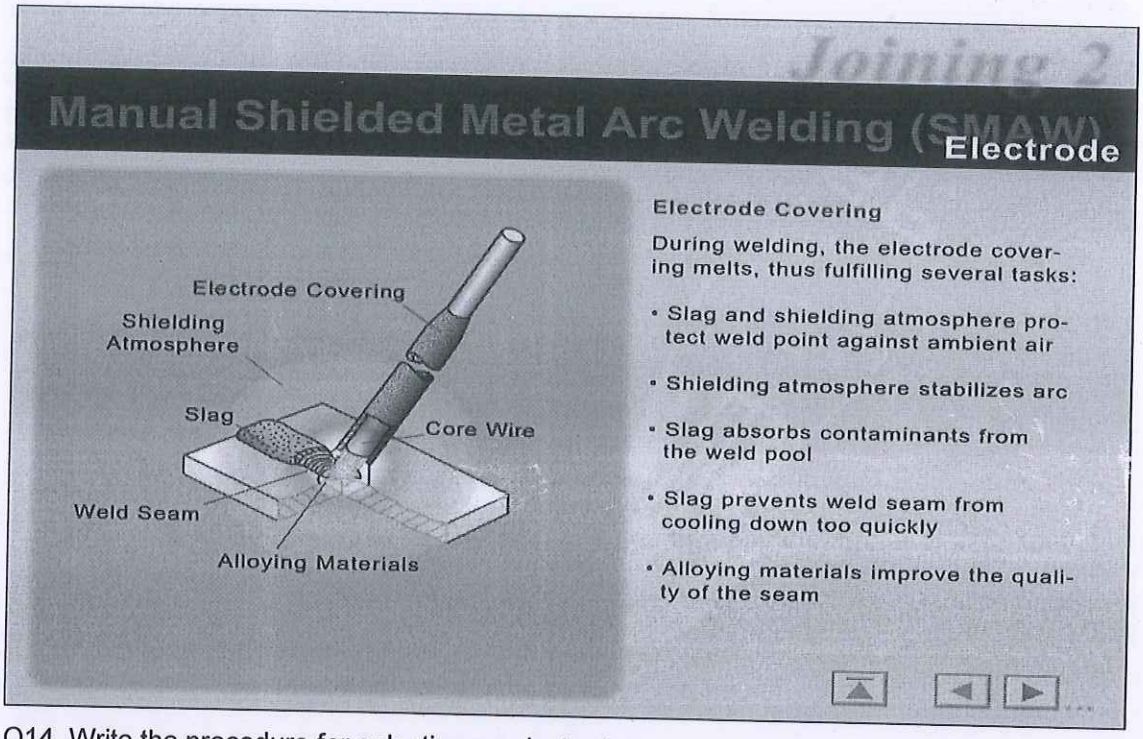
Circumferential seams, for example, are identified by a circle.

Seams that are to be welded at the construction site, by a flag.

If it is necessary to include still further information, for example, about the welding procedure to be used, the corresponding designation number is placed behind a tail on the solid reference line.

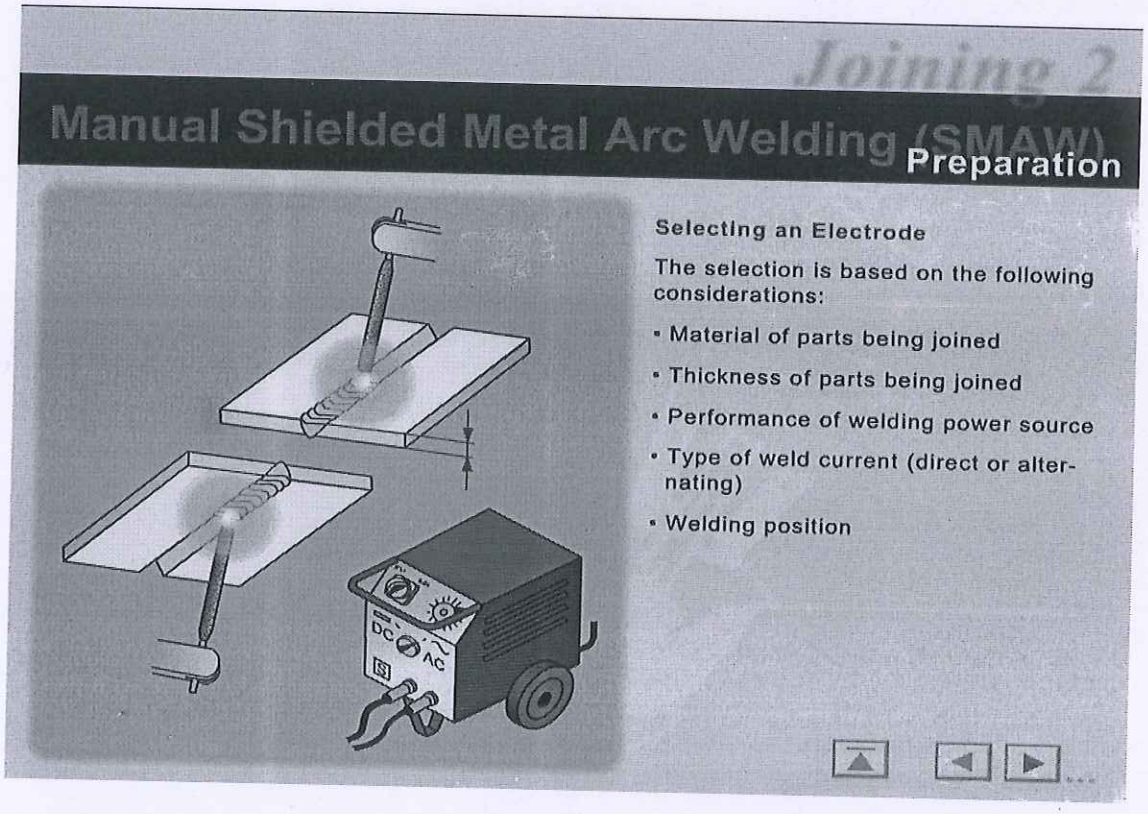
Q13. What are the functions of electrode covering?

Ans.



Q14. Write the procedure for selecting an electrode.

Ans.

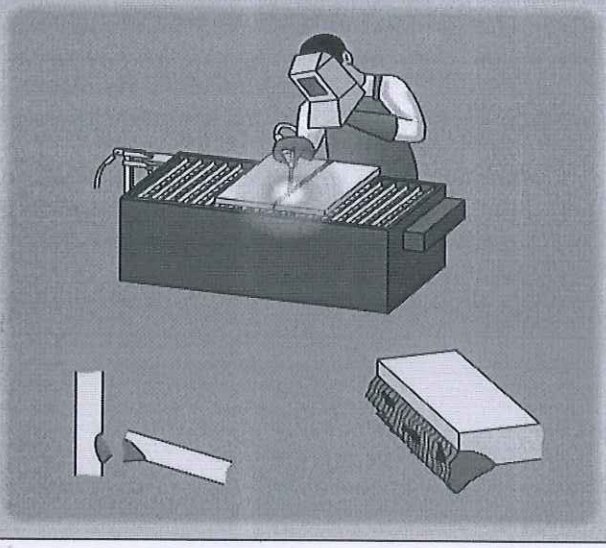


Section – C

04X06 = 24 Marks

Q15. Describe the weld seam inspection procedure in detail, also draw the diagram if needed.

Welded Joints
Weld Seams



Weld Seam Inspection Procedures

The quality of a weld seam, in addition to being a function of the work piece material and filler metal, is greatly dependent on the skill of the welder.

For some welding work, in the nuclear industry and aerospace technology, for example, there are especially strict quality requirements.

For this reason, there are various procedures for inspecting the strength and quality of weld seams.

Joining 2

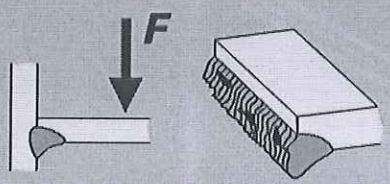
Welded Joints
Weld Seams

Weld Seam Inspection Procedures

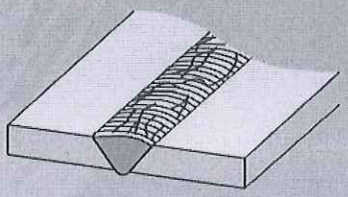
Inspection procedures are divided into two basic types: destructive and non-destructive.

You will be presented with more detail about the various procedures on the following pages.

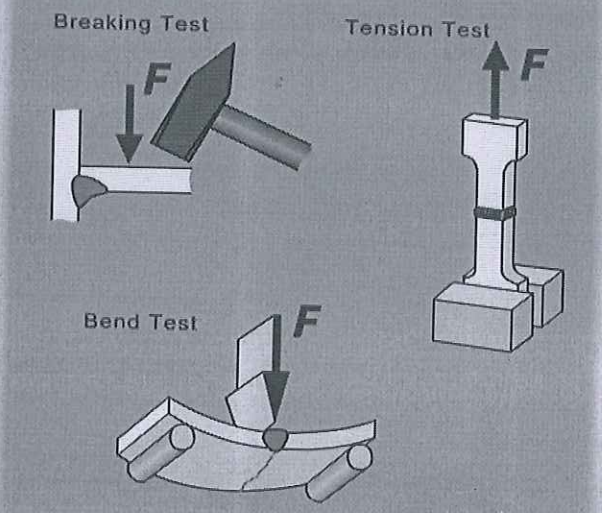
Destructive Inspection Procedure



Non-Destructive Inspection Procedure



Welded Joints
Weld Seams



Destructive Weld Seam Inspection Procedures

Destructive weld seam inspection procedures are used, for example, to verify the mechanical strength of a welded joint.

During the breaking test, the weld seam is mechancially broken, for example, in a press or by means of hammer blows.

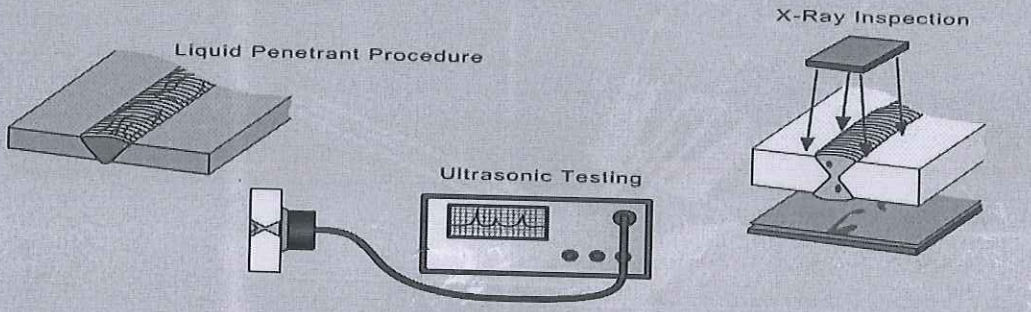
During the bend test, the weld seam is bent in a press until it breaks.

During the tension test, flat or round stock is stretched until it breaks.

Welded Joints
Weld Seams

Non-Destructive Weld Seam Inspection Procedures

Non-destructive weld seam inspection procedures can be used to identify structural defects in the seam, such as cracks or slag inclusions.



Joining 2

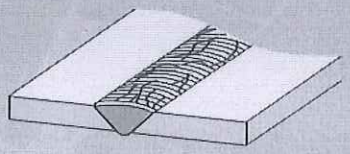
Welded Joints — Weld Seams

Liquid Penetrant Procedure

During the liquid penetrant procedure, special red liquid is first sprayed on the seam.

The liquid penetrates through capillary action, even into very thin cracks and gaps.

After drying, a white powder is applied which makes the red color visible.



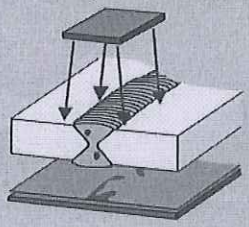
Joining 2

Welded Joints — Weld Seams

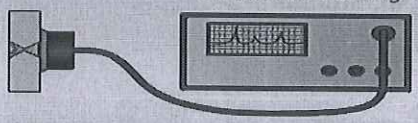
Non-Destructive Weld Seam Inspection Procedures

Non-destructive weld seam inspection procedures can be used to identify structural defects in the seam, such as cracks or slag inclusions.

X-Ray Inspection



Ultrasonic Testing



Joining 2

Welded Joints — Weld Seams

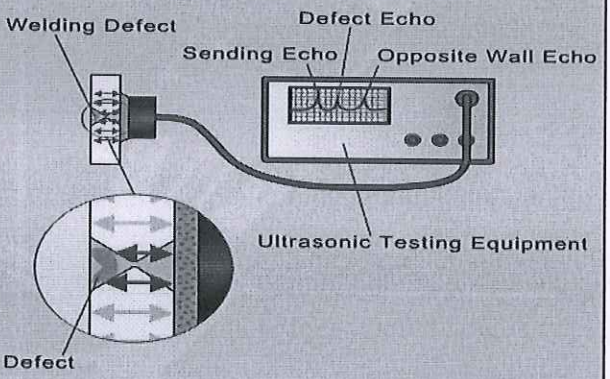
Ultrasonic Testing

During ultrasonic testing, a signal generator with an oil coupling, a so-called pulser, is placed on the site of the weld.

The pulser projects sound waves. The waves reflect off the opposite work piece surface and are then collected again by the pulser.

If there is a weld defect, the sound waves that strike the defect reflect immediately and return more quickly to the pulser.

The testing equipment then registers a defect echo.



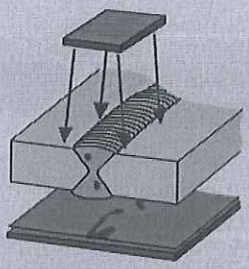
Joining 2

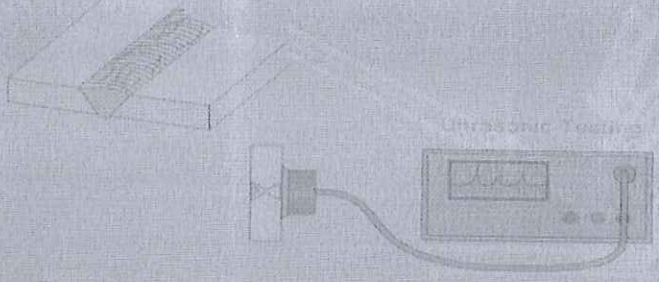
Welded Joints
Weld Seams

Non-Destructive Weld Seam Inspection Procedures

Non-destructive weld seam inspection procedures can be used to identify structural defects in the seam, such as cracks or slag inclusions.

X-Ray Inspection





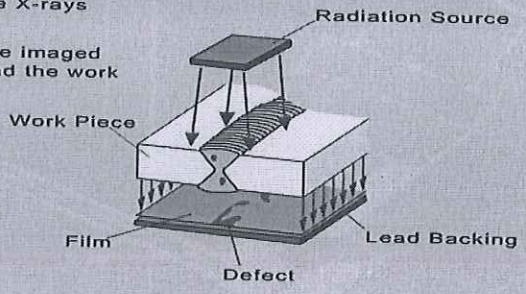
Joining 2

Welded Joints
Weld Seams

X-Ray Inspection

During an X-ray inspection, the X-rays penetrate the weld seam.

Possible weld seam defects are imaged on a sheet of film placed behind the work piece.

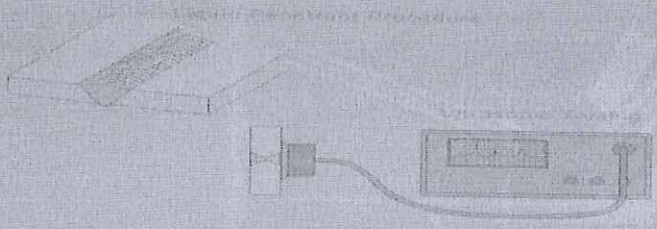


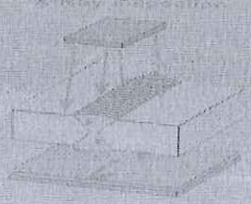
Joining 2

Welded Joints
Weld Seams

Non-Destructive Weld Seam Inspection Procedures

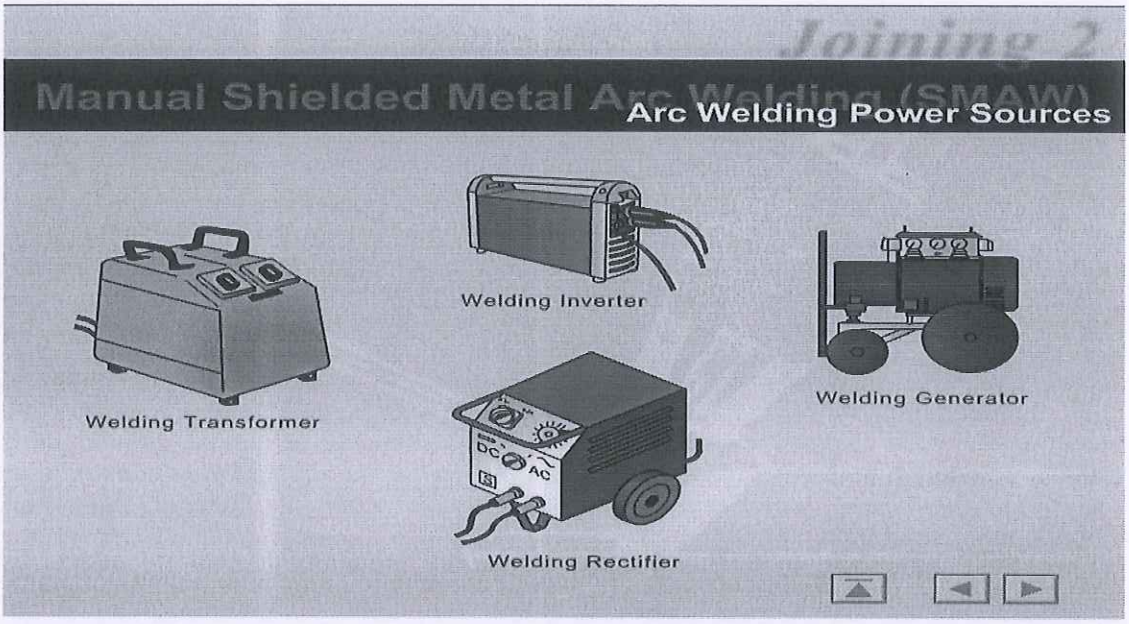
Non-destructive weld seam inspection procedures can be used to identify structural defects in the seam, such as cracks or slag inclusions.

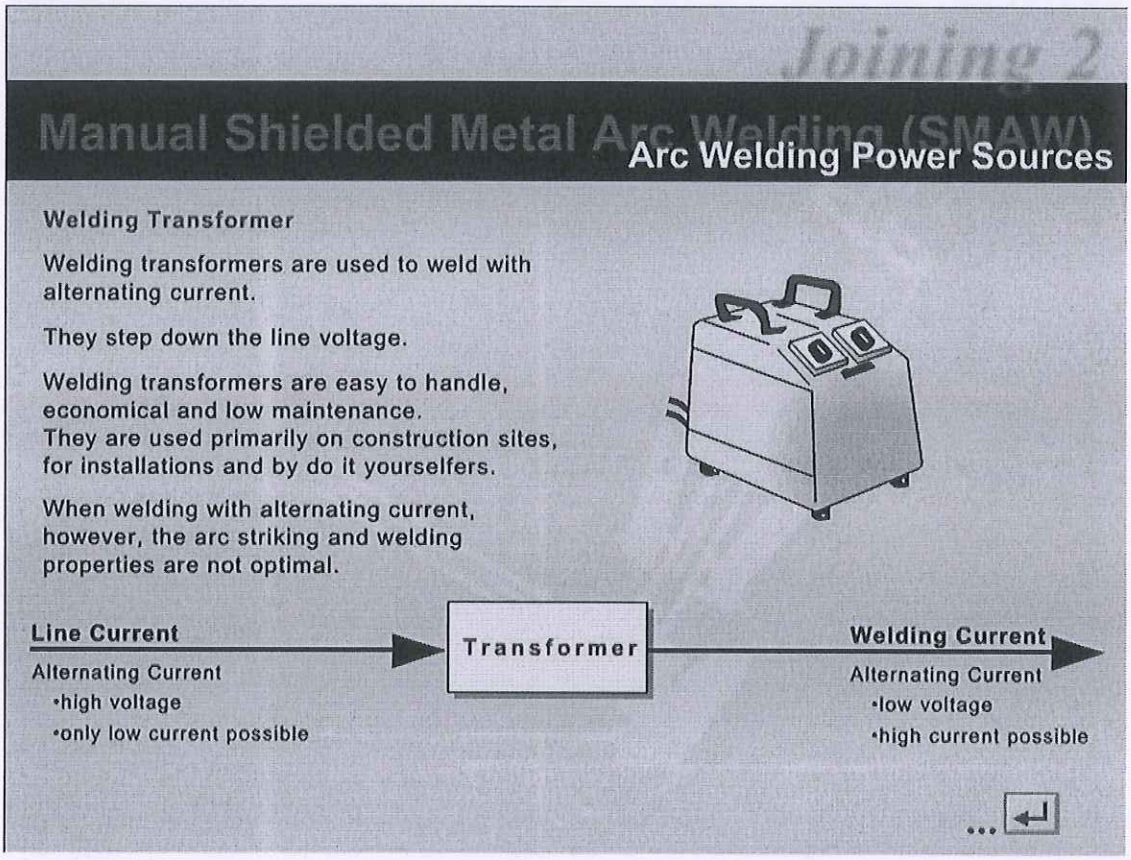




Q16. Define the arc welding power source? And describe its type in detail

Ans.





Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Arc Welding Power Sources

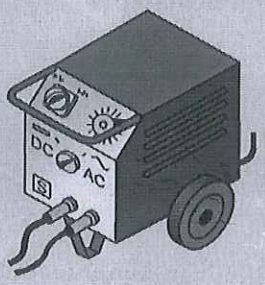
Welding Rectifier

The welding rectifier is a combination of transformer and downstream rectifier.

Welding rectifiers are economical, low maintenance and have very good arc striking and welding properties.

Most of these machines can also be used to weld with alternating current by switching off the rectifier.

They are used in shops and on construction sites.



Line Current
Alternating Current
- high voltage
- only low current possible

→ **Transformer** →

Alternating Current
- low voltage
- high current possible

→ **Rectifier** →

Welding Current
Direct Current
- low voltage
- high current possible

...

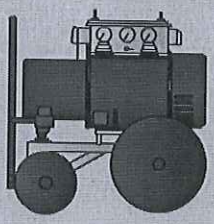
Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Arc Welding Power Sources

Welding Generator

The welding generator has an electric motor or a combustion engine and a generator.
The motor or engine drives the generator via a common shaft.
The generator then converts the mechanical energy back into electrical energy, mostly in the form of direct current.
As a so-called portable welder, the combustion engine driven welding generator is especially well suited for use on construction sites.
Welding generators are, however, loud, expensive to produce and high maintenance.



Welding Generator

Line Current
Alternating Current
- high voltage
- only low current possible

→ **Engine** →

mechanical energy

→ **Generator** →

Welding Current
Direct Current
- low voltage
- high current possible

...

Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Arc Welding Power Sources

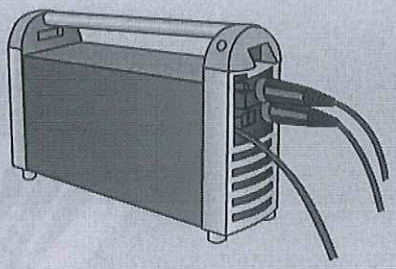
Welding Inverter

In contrast to traditional welding power sources, the welding converter rectifies the current before sending it to the transformer.

This allows the transformer and the other down-stream components to be designed considerably smaller and lighter.

The welding inverter is therefore a high performance welding power source with a very compact construction.

Because they also consume little energy and offer better control of the welding process, they are used very frequently nowadays.



...

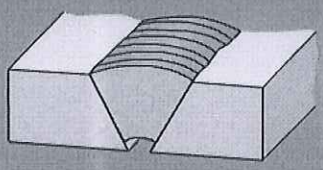
Q17. What is welding defects? Make the list of welding defects and its causes.

Ans.

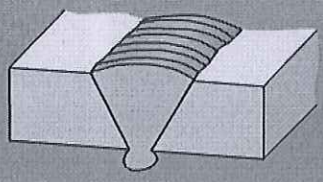
Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Welding Defects



Root Recessed



Excessive Root

Welding defects decrease the strength of the seam and increase the risk of failure through stress risers.

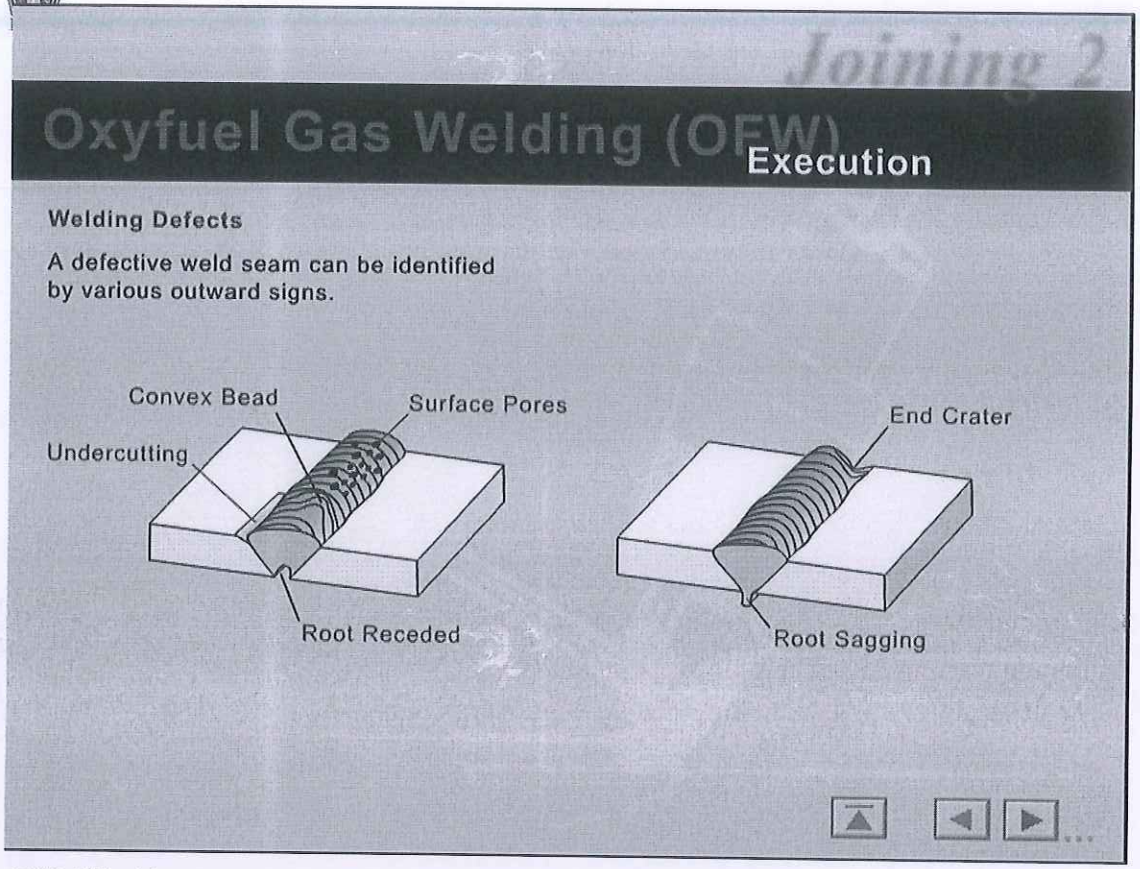
Seam root is incompletely formed:

- Gap between the parts being joined too small
- Welding current intensity too low
- Gap between electrode tip and work piece too large

Seam root is over formed:

- Gap between the parts being joined too large
- Welding current intensity too high
- Gap between electrode tip and work piece too small

...



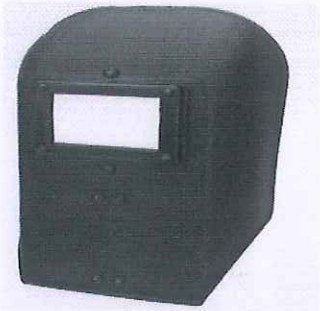
Q18. What is protective gear? Give the use of six protective gear.

Ans.

Protective Equipment

1. WELDING HELMET
King Shield - Auto

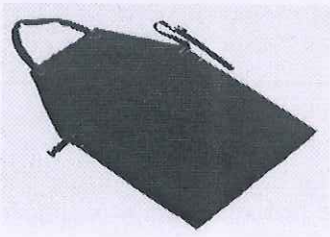
2. HAND SHIELD King Shield - Hand



3. Hand Gloves- MIG/ MMA

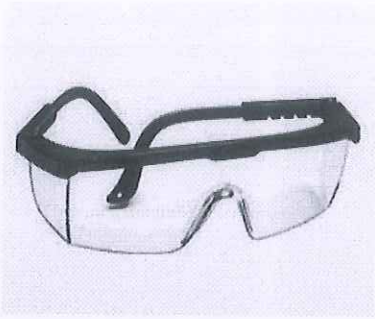
4. Hand Gloves- TIG

5. Welding Apron

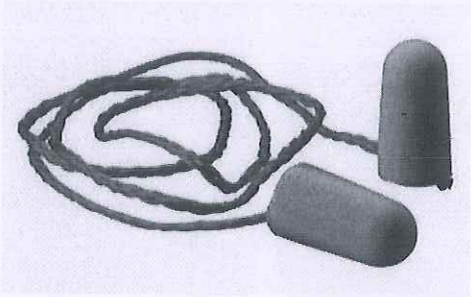


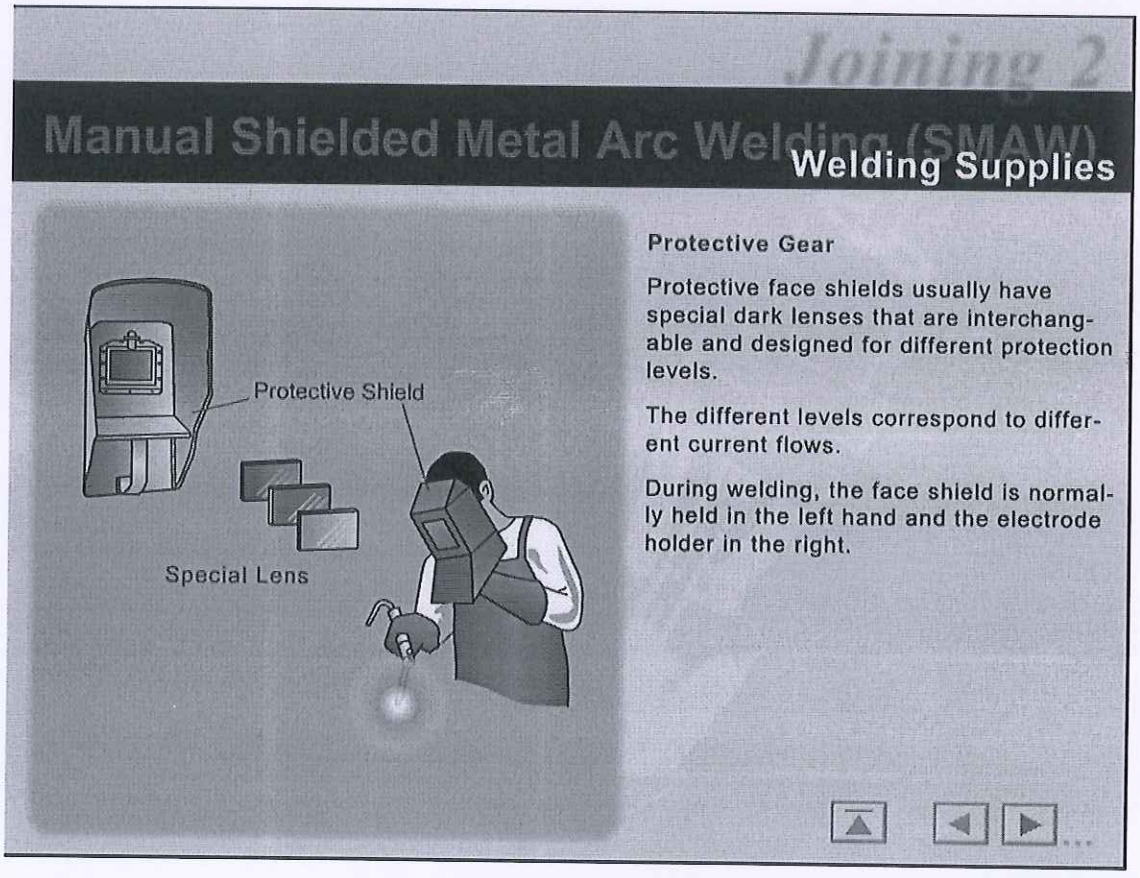
6. Safety Shoes

7. Safety Goggle



8. Ear Plug





Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Welding Supplies

Protective Gear

In contrast to the protective face shield, the welding helmet allows you to work with both hands.

This model has a clear viewing lens that darkens instantaneously when the arc is struck.

The darkening is controled by photo sensitive diodes.

QP Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1103 Set-B **Time: 2 Hours**

Course Name: Electrode welding (MMAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The eyes of the welding operator must be protected against

a) Ultraviolet radiation
b) Infrared radiations
c) Both (A) and (B)
d) Solar radiation

Q2. Chipping hammers are used

a) To remove slag from welding
b) To align the pieces to be welded
c) For tag welding
d) For marking spots to be welded

Q3. Distortion in welding is occurs due to.

a.) heat b.) Current

c.) shielding gas d.) Polarity

Q4. For which metal we can use E 7018 electrode?

a.) low carbon steel b.) Stainless steel

c.) high carbon steel d.) Aluminum

Q5. Which polarity gives the maximum heat to work piece?

a.) DCEN b.) DCEP

d.) All of above

Q6. What is the code for MMA welding?

a.) 141 b.) 131

c.) 111 d.) 311

Q7. Which is the destructive weld, seam inspection procedure?

a.) liquid penetration test b.) X-ray inspection

c.) bend test d.) Visual inspection

Q8. Which process is used for protecting the base metal from wear out?

a.) Soldering b.) Hard facing

c.) brazing d.) Grooving

Q9. Which of the welding procedure listed below, belongs to metal arc category?

a.) friction welding b.) Oxy acetylene welding

c.) shielded metal arc welding d.) Forge welding

Q10. The welding transformer used in MMA welding will

a) Step up current
b) Step down current
c) Step up voltage
d) Step up power

Section – B

04X04 = 16 Marks

Q11. Give the tasks of electrode covering.

Q12. What is welded joints? Give the name of any four type of welded joints and explain them in brief.

Q13. Classify the welding procedures.

Q14. How to represent fillet weld seam symbol? Explain

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

04X06 = 24 Marks

Q15. Explain destructive and non-destructive welding seam inspection procedure. (Three each)

Q16. Give the uses of welding hand tools along with their diagram.

Q17. How to strike the arc? Explain guiding the electrode in detail.

Q18. Write down occupational safety for Shielded metal arc welding.

Vetted
Rishi Lohan

AS Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer key

Answer sheet End-Sem. Examination

Course Code: MCS1103 **Time: 2 Hours**

Course Name: Electrode welding (MMAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The eyes of the welding operator must be protected against

a) Ultraviolet radiation
b) Infrared radiations
c) Both (A) and (B)
d) Solar radiation

Ans. C

Q2. Chipping hammers are used

a) To remove slag from welding
b) To align the pieces to be welded
c) For tag welding
d) For marking spots to be welded

Ans. A

Q3. Distortion in welding is occurs due to.

a.) **heat** b.) Current

c.) shielding gas d.) Polarity

Ans. A

Q4. For which metal we can use E 7018 electrode?

a.) **low carbon steel** b.) Stainless steel

c.) high carbon steel d.) Aluminum

Ans. A

Q5. Which polarity gives the maximum heat to work piece?

a.) **DCEN** b.) DCEP

a.) AC d.) All of above

Ans. A

Q6. What is the code for MMA welding?

a.) 141 b.) 131

c.) **111** d.) 311

Ans. C

Q7. Which is the destructive weld, seam inspection procedure?

a.) liquid penetration test b.) X-ray inspection

c.) **bend test** c.) Visual inspection

Ans. C

Q8. Which process is used for protecting the base metal from wear out?

a.) Soldering b.) **Hard facing**

c.) brazing d.) Grooving

Ans. B

Q9. Which of the welding procedure listed below, belongs to metal arc category?

a.) friction welding b.) Oxy acetylene welding

c.) **shielded metal arc welding** d.) Forge welding

Ans. C

Q10. The welding transformer used in MMA welding will

a) **Step up current**
b) Step down current
c) Step up voltage
d) Step up power

Ans. A

Section – B

04X04 = 16 Marks

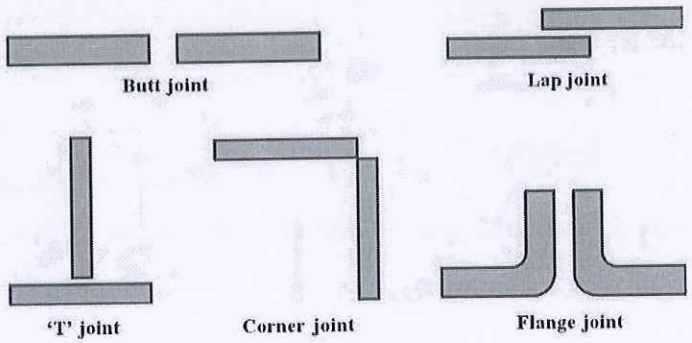
Q11. Give the tasks of electrode covering.

Ans.

- Stabilize the arc
- Ionize the arc
- Protect the weld material from atmospheric gases.
- Allow slag to form and cover the weld material (slower cooling)

Q12. What is welded joints? Give the name of any four type of welded joints and explain them in brief.

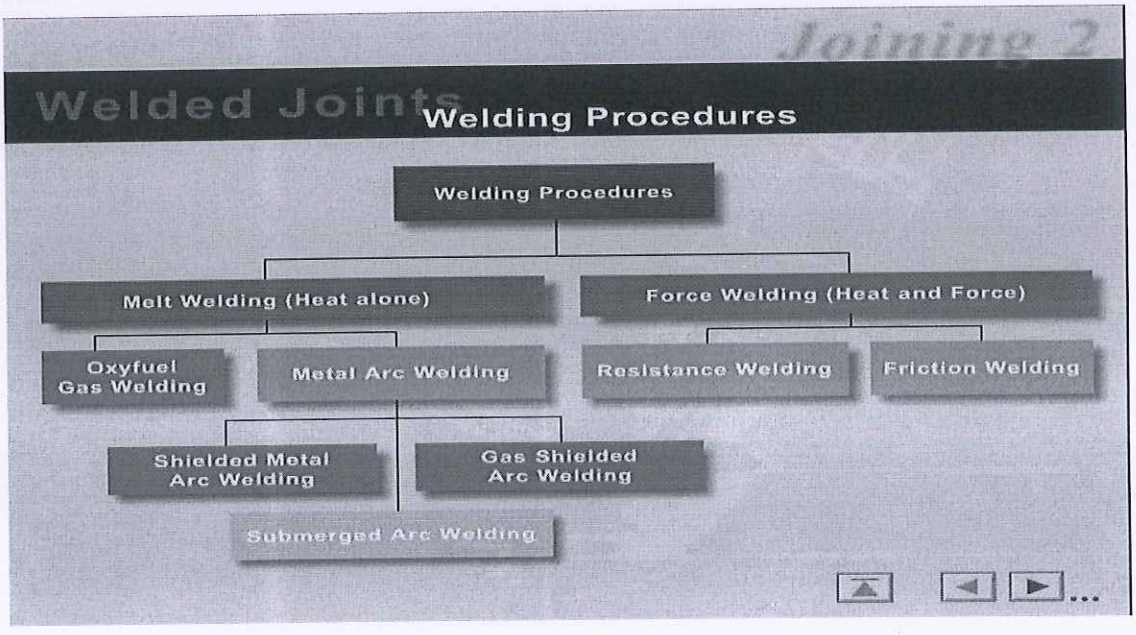
Ans. The welded joint is the area in which the work pieces are to be welded to one another. The joint type is determined by the position/arrangement of the work pieces relative to one another.



Types of Welded Joints

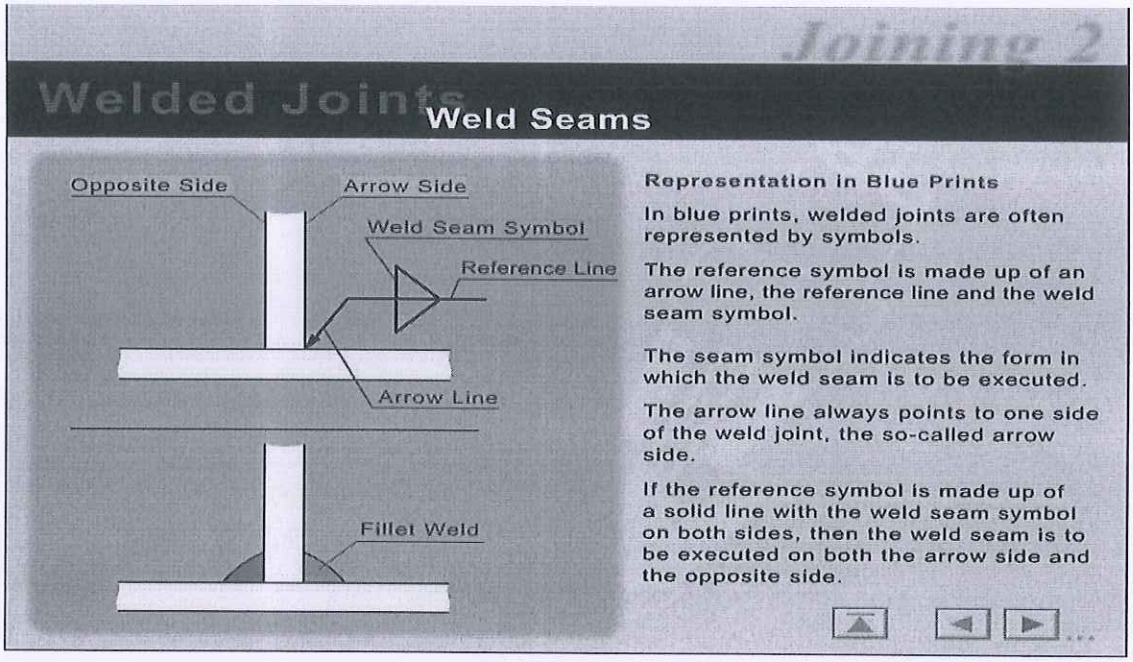
Q13. Classify the welding procedures.

Ans.



Q14. How to represent fillet weld seam symbol? Explain

Ans.



Section – C

04X06 = 24 Marks

Q15. Explain destructive and non-destructive welding seam inspection procedure. (Three each)

Ans.

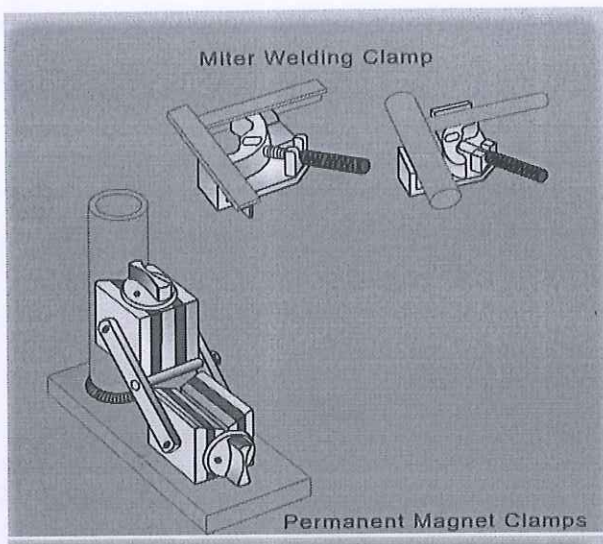
Destructive Testing procedure

1. Fracture test: - The welded seam is mechanically broken.
2. Folding test: - The welding seam is bent under a press until it breaks.
3. Tensile test: - A flat or round bar is drawn in the longitudinal direction until it breaks.

Non-destructive testing procedures

1. Visual inspection: - Using the naked eye or a magnifying glass.
2. Dye penetration testing (capillary process): - Rust, dirt and dye are removed, capillary liquid (red) is sprayed on. Any cracks then become visible in red.
3. Displacement with water: - A pressure test is performed at the stipulated pressure.
4. X- Ray testing: - They are capable of penetrating workpiece. Welded seam faults are projected onto a radiation-sensitive film positioned behind the workpiece.

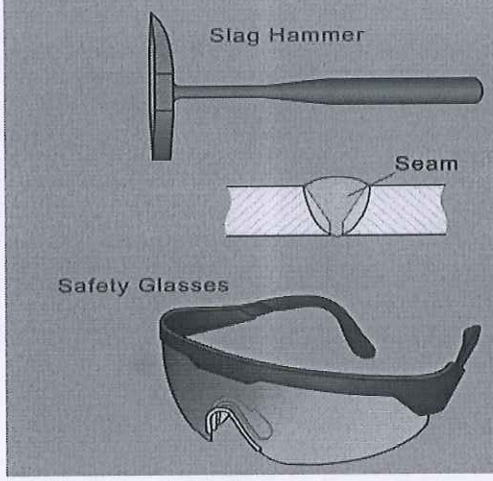
Q16. Give the uses of welding hand tools along with their diagram.



Clamping Devices

Once they have been aligned, the parts being welded must be held securely in place.

Therefore, permanent magnet clamps and miter welding clamps, among others, are used to hold parts and keep them from shifting.

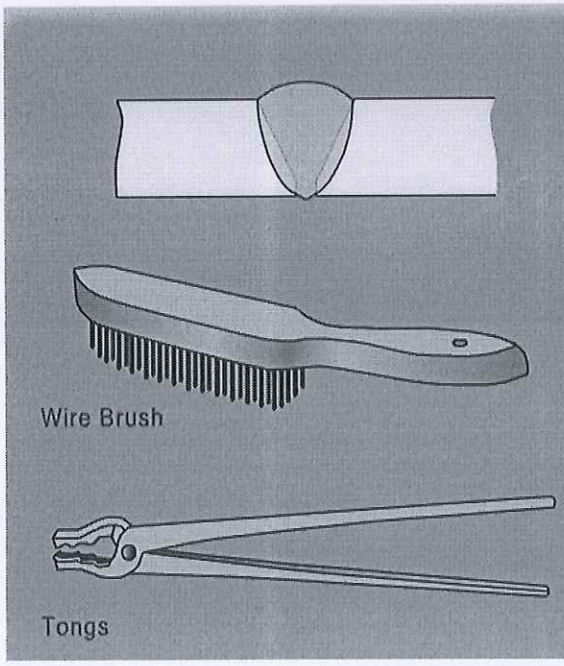


Tools

During manual shielded metal arc welding, a slag coating forms over the weld seam.

This coating is removed by tapping lightly with the slag hammer.

Eye protection must always be worn during this process.



Tools

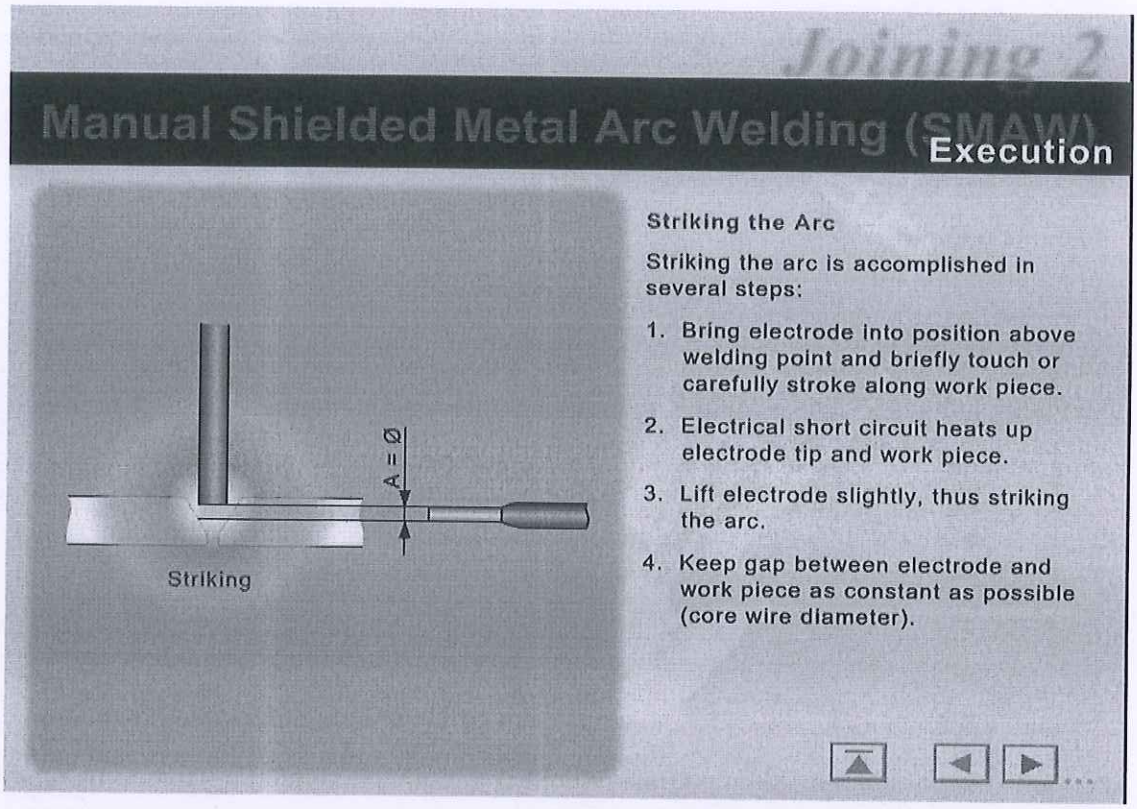
Before welding, the wire brush is used to remove rust and paint residue from the weld groove.

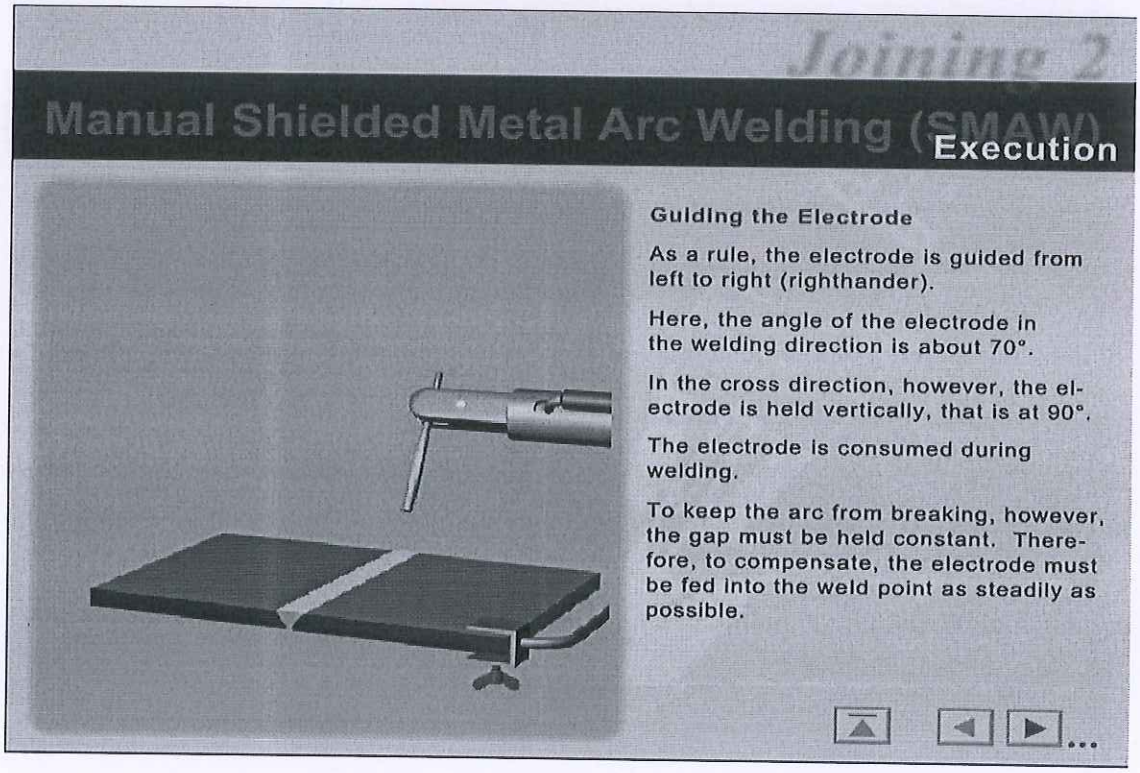
After welding, it is used to clean the seam.

Hot weldments are held and moved with tongs.

Q17. How to strike the arc? Explain guiding the electrode in detail.

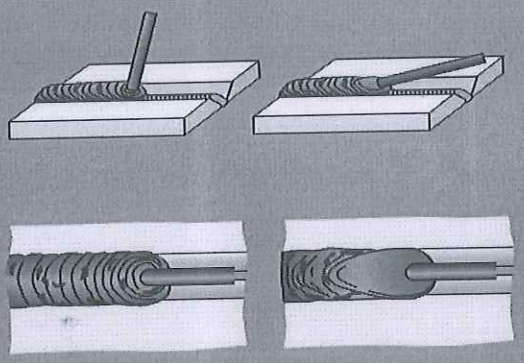
Ans.





Joining 2

Manual Shielded Metal Arc Welding (SMAW) Execution



Guiding the Electrode

The angle at which the electrode is held has a very strong influence on the slag flow.

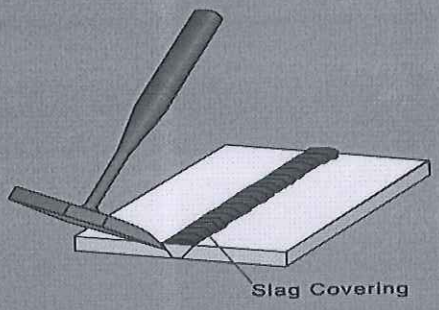
If the angle is too steep, the slag runs ahead of the weld point and gets trapped within the molten pool.

If the angle is too flat, then the slag runs behind the weld point.

The result, in both cases, is the formation of so-called slag holes.

Joining 2

Manual Shielded Metal Arc Welding (SMAW) Execution



Guiding the Electrode

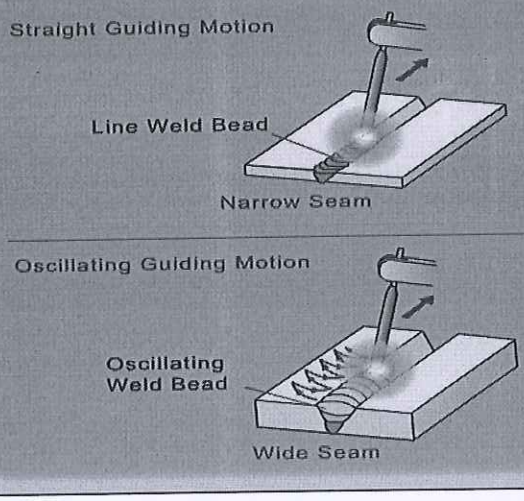
If the electrode is held in the optimal position, the slag remains completely on top of the weld seam.

After the seam has cooled down, it can be removed completely.

One or more hammer blows will accomplish this task.

Joining 2

Manual Shielded Metal Arc Welding (SMAW) Execution



Guiding the Electrode

If the electrode is guided in a straight line, the resulting weld seam will be narrow.

Especially with thick work pieces having wide weld grooves, the electrode must be guided with an oscillating motion.

The result here is a wide weld seam.

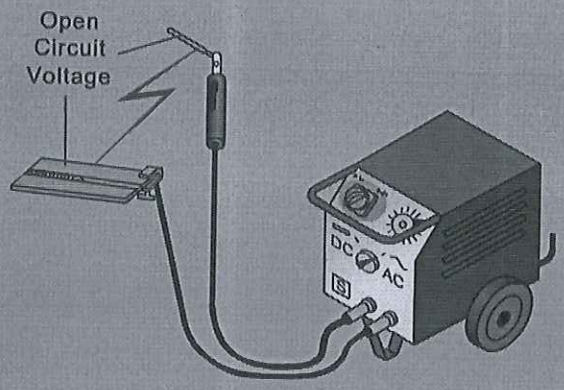
Q18. Write down occupational safety for Shielded metal arc welding.

Ans.

Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Occupational Safety



During short welding interruptions, the welding power source is normally left switched on.

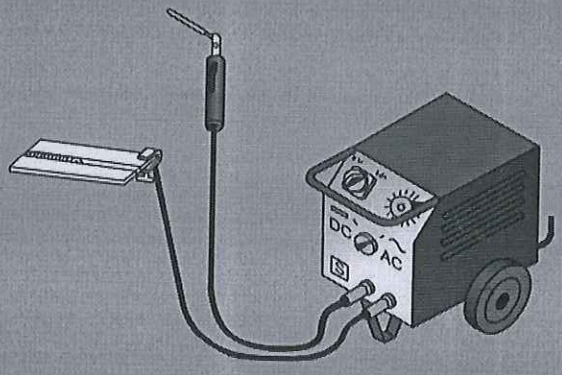
The so-called open circuit voltage is then present between the work piece and the electrode.

If this electrical circuit were to be closed by simultaneous contact with the work piece and the bare electrode core, a life threatening electrical shock would result.

Joining 2

Manual Shielded Metal Arc Welding (SMAW)

Occupational Safety



Therefore, your life depends on following the rules for manual shielded metal arc welding presented below:

- Always wear leather gloves when welding and replacing electrodes.
- Switch off the welding power source during longer interruptions.
- In damp and confined spaces, such as in boilers and containers, the maximum open circuit voltage may not exceed 42 V for alternating current and 100 V for direct current.
- An insulating spacer made of rubber or wood must always be used when welding on damp or electricity conducting surfaces.

Vetted

QP Set-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1104 Set-A **Time: 2 Hours**

Course Name: Tungsten inert gas welding (GTAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which of the following is inert gas
   (a) Argon
   (b) H2
   (c) Co2
   (d) O2

2. Which current is used in TIG WELDING?
   (a) AC
   (b) AC and DC both
   (c) Dc
   (d) None of the above

3. Which TIG electrode is used to weld aluminum?
   (a) Thoriated
   (b) Pure tungsten
   (c) Zinc tungsten
   (d) None of the above

4. What is ISO code for TIG WELDING?
   (a) 114
   (b) 311
   (c) 136
   (d) 141

5. When Helium is used in TIG welding
   (a) Less penetration is required

(b) For cold welds
(c) Much penetration required
(d) For thin sheet metal

6. Which of the following welding process uses non – consumable electrode?
(A) MIG
(B) FCAW
(C) MMA
(D) TIG

7. Which polarity is used for welding Aluminum?
(A) DCEP
(B) AC
(C) DCEN
(D) DCEP AND DCEN

8. When Helium is used in TIG welding
(A) Less penetration is required
(B) Much penetration required
(C) For cold welds
(D) For thin sheet metal

9. Which of the following welding process has lowest deposition rate as compared to others?
(a) FCAW
(b) MMA
(c) MIG
(d) PAW

10. Which of the following gas mixture is used in TIG welding?
(a) Argon + CO2
(b) Argon + He
(c) He + H2
(d) Argon + N2

Section – B

04X04 = 16 Marks

Q11. Draw TIG welding diagram symbol for leg length 5mm

Q12. Define CC AND CV

Q13. Why we generally don't use DCEP in TIG welding

Q14. Give the relation between welding current type and electrode shape.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

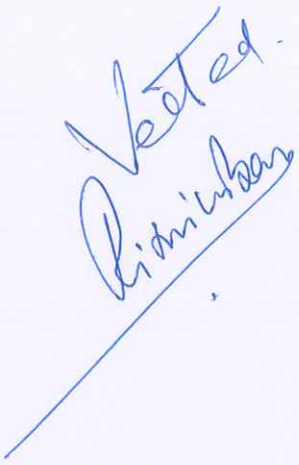
04X06 = 24 Marks

Q15. Compare TIG welding process in terms of advantage and disadvantages.

Q16. Describe tungsten grinding process for different materials

Q17. Draw the labelled view of TIG welding torch

Q18. Write the execution of TIG welding.



AS, Set-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1104 **Time: 2 Hours**

Course Name: Tungsten inert gas welding (GTAW) **Max. Marks: 50**

Instruction:

Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which of the following is inert gas
   (a) Argon
   (b) H2
   (c) Co2
   (d) O2

2. Which current is used in TIG WELDING?
   (a) AC
   (b) **AC and DC both**
   (c) Dc
   (d) None of the above

3. Which TIG electrode is used to weld aluminum?
   (a) Thoriated
   (b) Pure tungsten
   (c) Zinc tungsten
   (d) None of the above

4. What is ISO code for TIG WELDING?
   (a) 114
   (b) 311
   (c) 136
   (d) 141

5. When Helium is used in TIG welding
   (a) Less penetration is required

(b) For cold welds

(c) Much penetration required

(d) For thin sheet metal

6. Which of the following welding process uses non – consumable electrode?

(A) MIG

(B) FCAW

(C) MMA

(D) TIG

7. Which polarity is used for welding Aluminum?

(A) DCEP

(B) **AC**

(C) DCEN

(D) DCEP AND DCEN

8. When Helium is used in TIG welding

(A) Less penetration is required

(B) **Much penetration required**

(C) For cold welds

(D) For thin sheet metal

9. Which of the following welding process has lowest deposition rate as compared to others?

(a) FCAW

(b) MMA

(c) MIG

(d) PAW

10. Which of the following gas mixture is used in TIG welding?

(a) Argon + CO2

(b) Argon + He

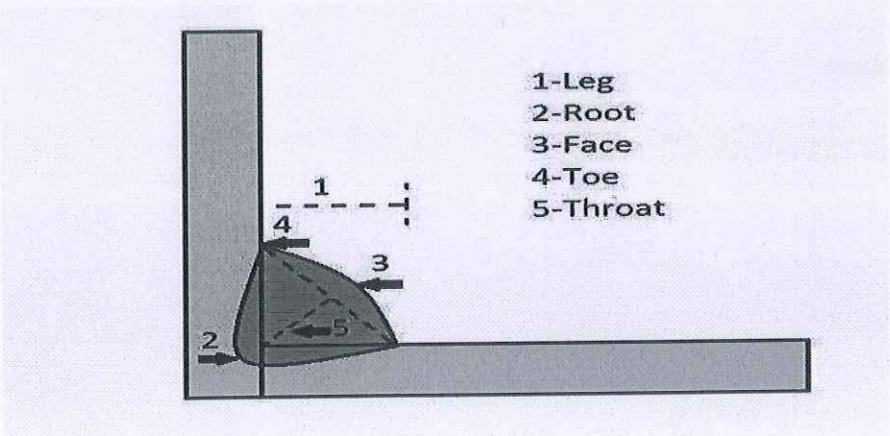
(c) He + H2

(d) Argon + N2

Section – B

04X04 = 16 Marks

Q11. Draw TIG welding diagram symbol for leg length 5mm



Q12. Define CC AND CV

Ans. Direct-current (DC) power supplies can be constant-voltage (CV) or constant-current (CC). CV equipment, typically used for semiautomatic and wire-fed processes like gas metal arc welding (GMAW) or flux-cored arc welding (FCAW), provides a consistent preset voltage.

Q13. Why we generally don't use DCEP in TIG welding

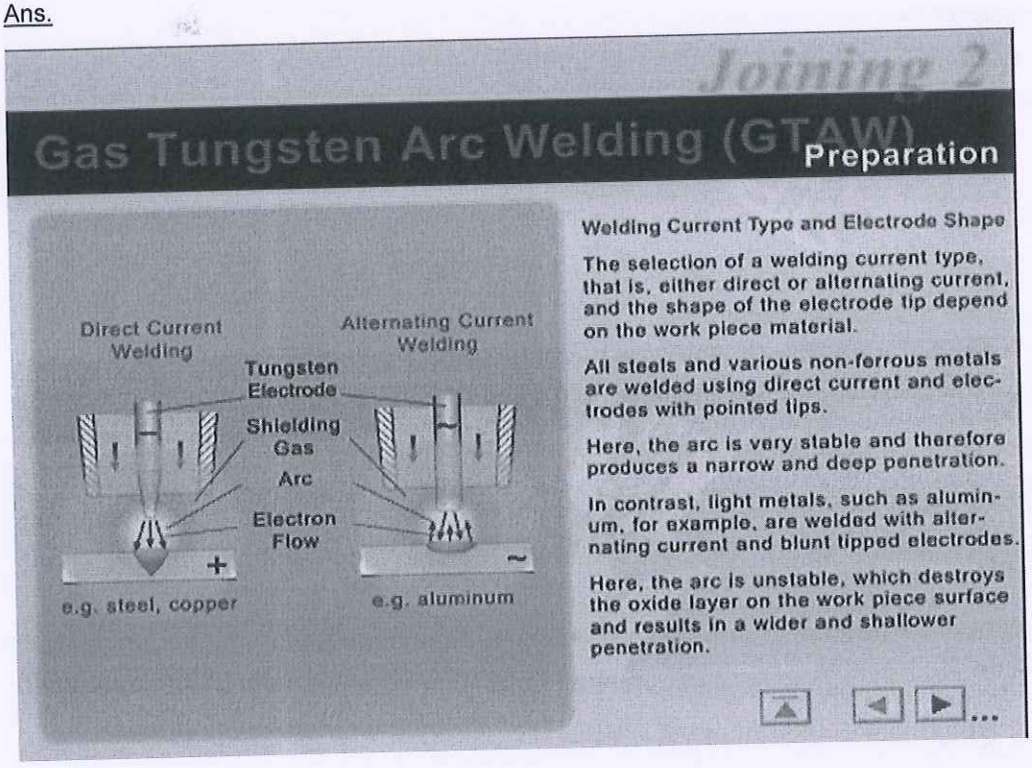
Ans. In TIG, if you really want to pour heat into the workpiece, you use DCEN. If you use DCEP, you can melt the tungsten in a hurry.

That makes sense if you remember that electrons are negatively charged, so when you TIG with DCEN, the electrons flow from the tungsten electrode into the workpiece, heating it as they impact it.

With stick welding, it's not so easy to remember, but in general the opposite is true: If you want a lot of penetration with stick, you use DCEP. If you want shallower penetration with stick, you use DCEN.

Q14. Give the relation between welding current type and electrode shape.

Ans.



Section – C

04X06 = 24 Marks

Q15. Compare TIG welding process in terms of advantage and disadvantages.

Ans. **Advantages of TIG:**

It doesn't require any flux and this is because of the inert gas shields molten metal. Therefore, there are no hassles with the slag and inclusion of slag.

This welding machine will easily provide you with high quality and strong welding finishes.

The welding work done with this welding machine will provide you with neat and appealing joints and many times, they don't need any finishing process to be done on them due to the excellent welding work done with the TIG.

One can easily weld a wide range of materials with TIG.

This welding machine requires the minimum amount of flames and also sparks.

The small heat zone ensures that there is less amount of distortion when working with this welding machine.

One can easily work with this welding machine in both manual and automatic.

This welding machine is suitable for work with very thin sections, as there is less amount of heat applied when welding.

This welding machine offers versatile options when welding with a wide range of materials.

Disadvantages of TIG:

One can only weld thin materials with this welding machine. This is not suitable for the thick materials.

It will take a lot of time when welding. Welding with this welding machine is time consuming and the speed is slower than any other welding machines available in the market as well. It also has got lower filler deposition rate as well.

It has got high initial cost. It is quite complicated to be used and mostly used by the professionals and highly skilled welders.

Q16. Describe tungsten grinding process for different materials

Ans. The complete electrode geometry for DC welding comprises the electrode diameter, the included angle (taper), and the tip (flat) (see **Figure 1**).

The choice of geometry will always affect electrode life, arc starting, weld penetration, and arc shape. Regardless of the geometry selected, the electrode configuration must be tested during welding procedure development. The geometry should be noted as a critical process variable for the weld procedure and held to close tolerances for all subsequent welds.

Electrode Diameter. The best place to start when choosing the electrode diameter is to consult the welding equipment manufacturer's recommendations. While small diameters are easier to arc-start, large diameters accommodate higher amperages and last longer than smaller diameters. However, if current levels are higher than recommended, the tungsten will deteriorate too rapidly, fall into the weld pool, and contaminate the weld. Conversely, if the current is too low for the electrode diameter, the arc will become unstable.

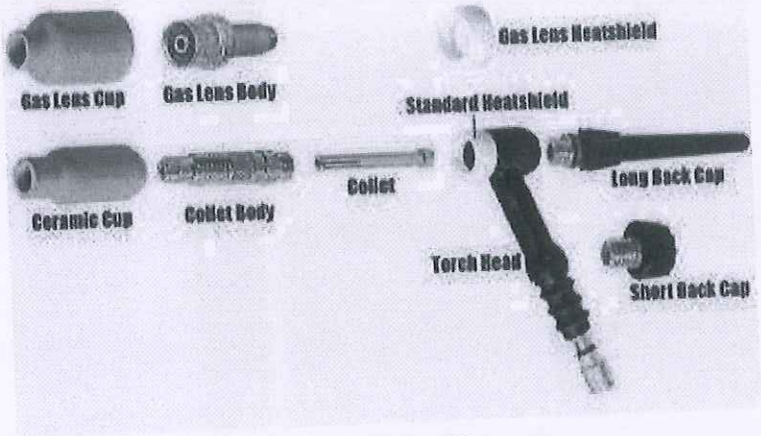
Electrode Included Angle (Taper). Electrodes for DC welding should be ground longitudinally and concentrically with diamond wheels to an included angle in conjunction with the tip/flat preparation.

A blunt taper with a large included angle results in longer electrode life, better weld penetration, narrower arc shape, and the ability to handle more amperage without eroding. A sharp taper with a small included angle offers less arc wander and a wider, more consistent arc.

Tip (Flat). The shape of the tungsten electrode tip is an important process variable in precision arc welding, because as the flat size increases, so does the chance of arc wander and starting difficulty. However, increasing the flat also improves weld penetration and increases electrode life (see**Figure 2**).

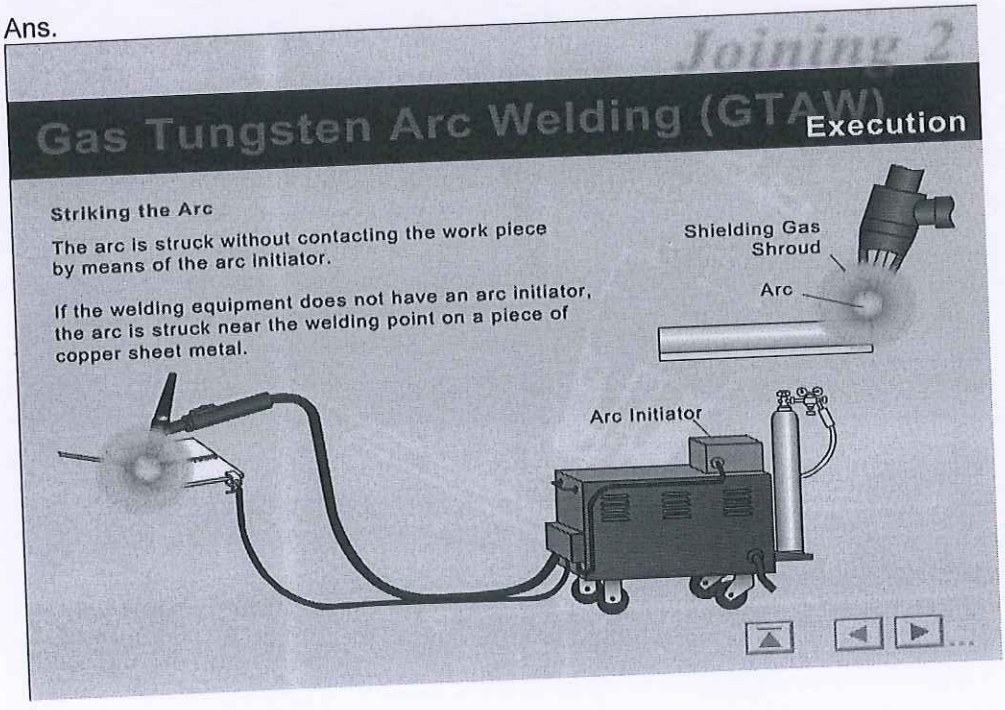
An incorrect, inconsistent flat can cause pointed electrode tips to drop into the weld pool. It also can result in arc instability, reduced electrode life, and changes in arc voltage from one electrode to another.

Q17. Draw the labelled view of TIG welding torch



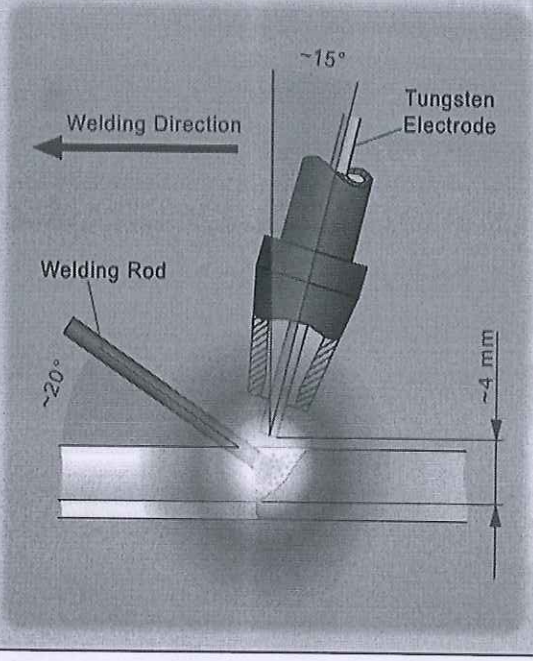
Q18. Write the execution of TIG welding.

Ans.



Joining 2

Gas Tungsten Arc Welding (GTAW) Execution



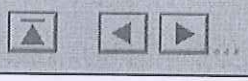
Working Technique

TIG welding is performed from right to left (right hander), with the torch following the welding rod.

During welding, the torch is inclined about 15° away from the welding direction.

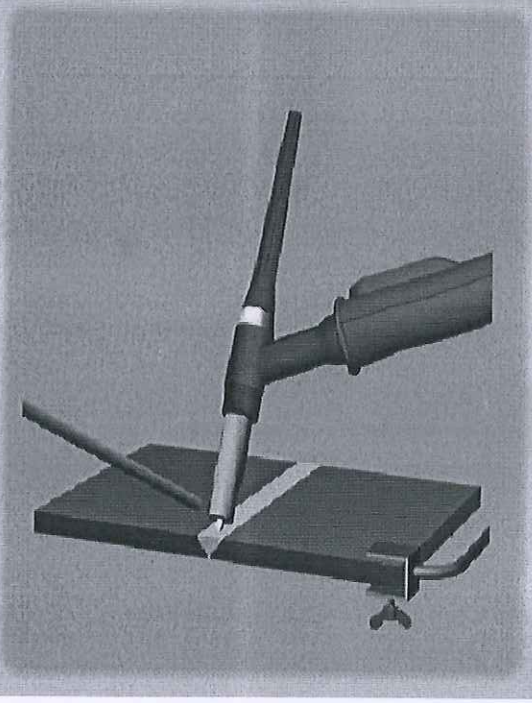
The welding rod is held at an angle of about 20° above the work piece plane.

The gap between the electrode tip and the work piece (arc length) should be between 3 and 5 mm.



Joining 2

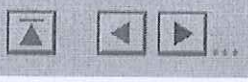
Gas Tungsten Arc Welding (GTAW) Execution



Working Technique

During welding, the filler metal is fed by dipping it into the molten pool.

After the arc is extinguished, the shielding gas must continue to flow over the welding point until the molten pool has solidified.



Vetted

QP. Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Set-B

Course Code: MCS1104 **Time: 2 Hours**

Course Name: Tungsten inert gas welding (GTAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which of the following welding process uses a non-consumable welding electrode?
   (a) TIG
   (b) MIG
   (c) MAG
   (d) MMA

2. Which of the following welding process has lowest deposition rate as compared to others?
   (a) FCAW
   (b) MMA
   (c) MIG
   (d) PAW

3. Which of the following gas mixture is used in TIG welding?
   a) Argon + CO2
   b) Argon + He
   c) He + H2
   d) Argon + N2

4. TIG welding best suited for?
   (a) Mild steel
   (b) Stainless steel
   (c) Aluminum
   (d) Silver

5. Preheating is essential in welding for
   (a) High speed steel
   (b) Cast iron
   (c) Stainless steel
   (d) Silver

6. Which of the following gas mixture is used in TIG welding?
   a) Argon + CO2
   b) Argon + He
   c) He + H2
   d) Argon + N2

7. Which polarity is used for welding Aluminum?
   a) DCEP
   b) AC
   (c) DCEN
   (d) DCEP AND DCEN

8. When Helium is used in TIG welding
   a) Less penetration is required
   b) Much penetration required
   (c) For cold welds
   (d) For thin sheet metal

9. What is ISO code for TIG WELDING?
   a) 114
   b) 136
   (c) 311
   (d) 141

10. Which of the following is inert gas
   (a) Argon
   (b) H2
   (c) Co2
   (d) O2

Section – B

04X04 = 16 Marks

Q11. Write short note on electrode wear.

Q12. Why we generally don't use DCEP in TIG welding

Q13. What is the function of water cooling in TIG?

Q14. Give the relation between welding current type and electrode shape.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

04X06 = 24 Marks

Q15. What are the applications of TIG welding?

Q16. Compare TIG welding process in terms of advantage and disadvantages.

Q17. Write the execution of TIG welding.

Q18. Give the correct work technique with TIG

AS · Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1104 Answer key **Time: 2 Hours**

Course Name: Tungsten inert gas welding (GTAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which of the following welding process uses a non-consumable welding electrode?
   (a) TIG
   (b) MIG
   (c) MAG
   (d) MMA

2. Which of the following welding process has lowest deposition rate as compared to others?
   (a) FCAW
   (b) MMA
   (c) MIG
   (d) PAW

3. Which of the following gas mixture is used in TIG welding?
   a) Argon + CO2
   b) Argon + He
   c) He + H2
   d) Argon + N2

4. TIG welding best suited for?
   (a) Mild steel
   (b) Stainless steel
   (c) Aluminum
   (d) Silver

5. Preheating is essential in welding for
   (a) High speed steel
   (b) Cast iron
   (c) Stainless steel
   (d) Silver

6. Which of the following gas mixture is used in TIG welding?
   a) Argon + CO2
   b) Argon + He
   c) He + H2
   d) Argon + N2

7. Which polarity is used for welding Aluminum?
   a) DCEP
   b) **AC**
   (c) DCEN
   (d) DCEP AND DCEN

8. When Helium is used in TIG welding
   a) Less penetration is required
   b) **Much penetration required**
   (c) For cold welds
   (d) For thin sheet metal

9. What is ISO code for TIG WELDING?
   a) 114
   b) 136
   (c) 311
   (d) **141**

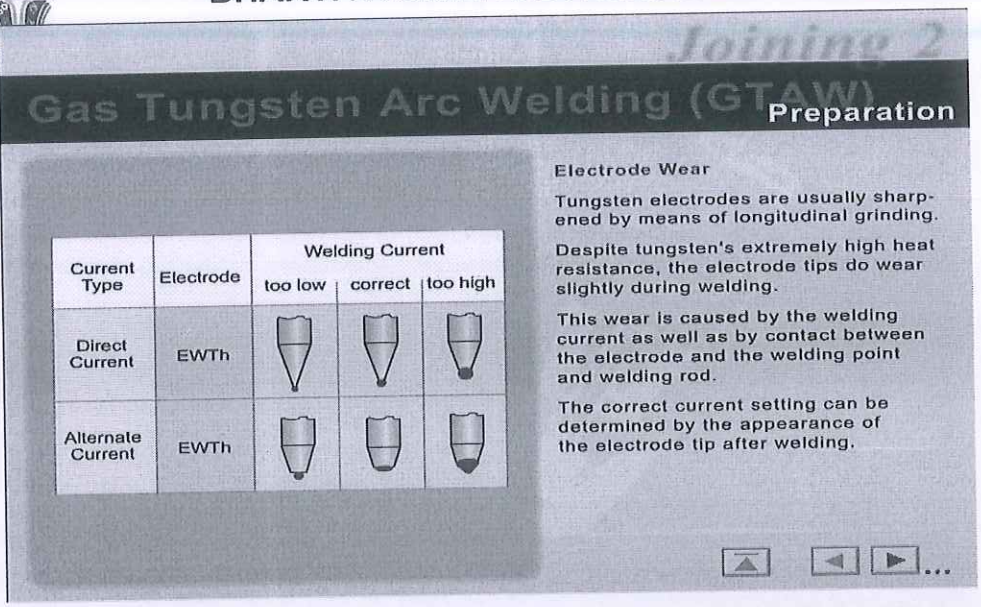
10. Which of the following is inert gas
   (a) Argon
   (b) H2
   (c) Co2
   (d) O2

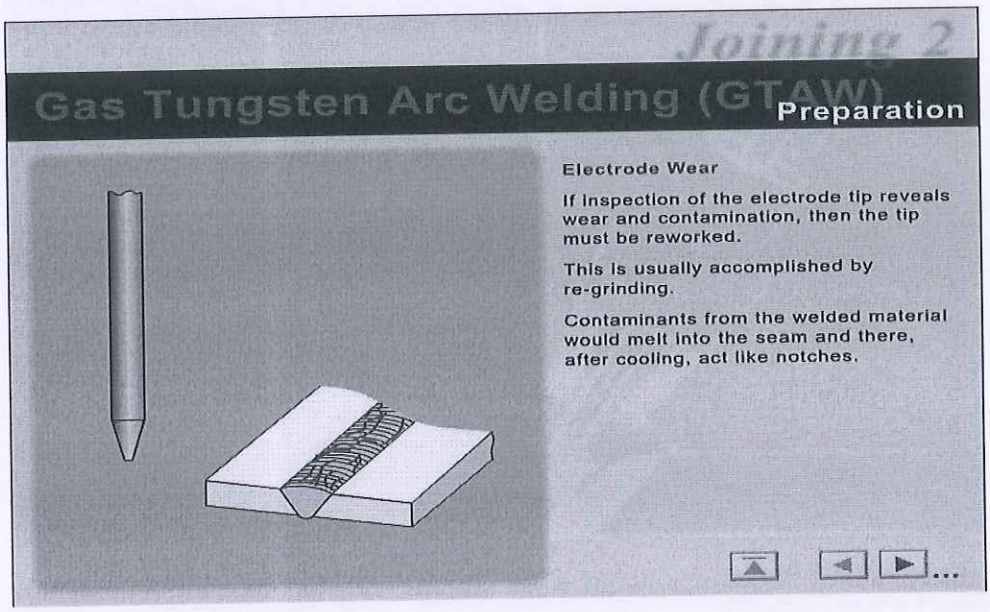
Section – B

04X04 = 16 Marks

Q11. Write short note on electrode wear.

Ans.





Q12. Why we generally don't use DCEP in TIG welding

Ans. In TIG, if you really want to pour heat into the workpiece, you use DCEN. If you use DCEP, you can melt the tungsten in a hurry.

That makes sense if you remember that electrons are negatively charged, so when you TIG with DCEN, the electrons flow from the tungsten electrode into the workpiece, heating it as they impact it.

With stick welding, it's not so easy to remember, but in general the opposite is true: If you want a lot of penetration with stick, you use DCEP. If you want shallower penetration with stick, you use DCEN.

Q13. What is the function of water cooling in TIG?

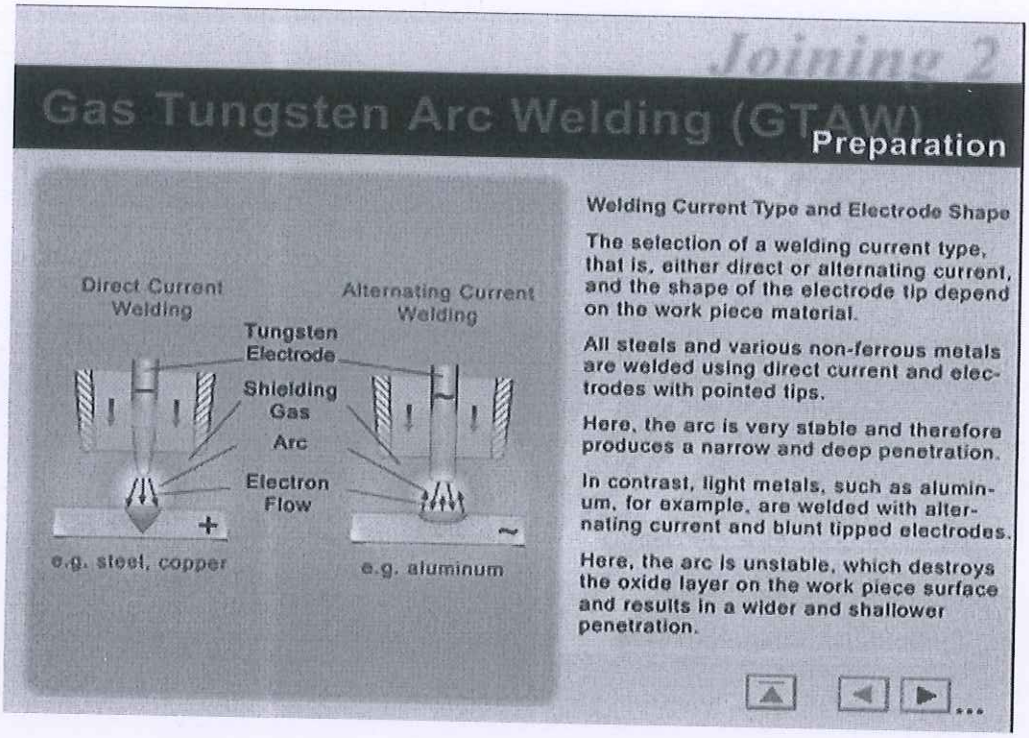
Ans. Cooling of the TIG Torch some torches are constructed in such a way that it is the flowing shielding gas that cools the torch. However, the torch also gives off heat to the surrounding air.

Other torches are constructed with cooling tubes. Water-cooled torches are mainly used for welding with larger current intensities and AC-welding.

Usually a water-cooled TIG torch is smaller than an air-cooled torch designed to the same maximum current intensities.

Q14. Give the relation between welding current type and electrode shape.

Ans.

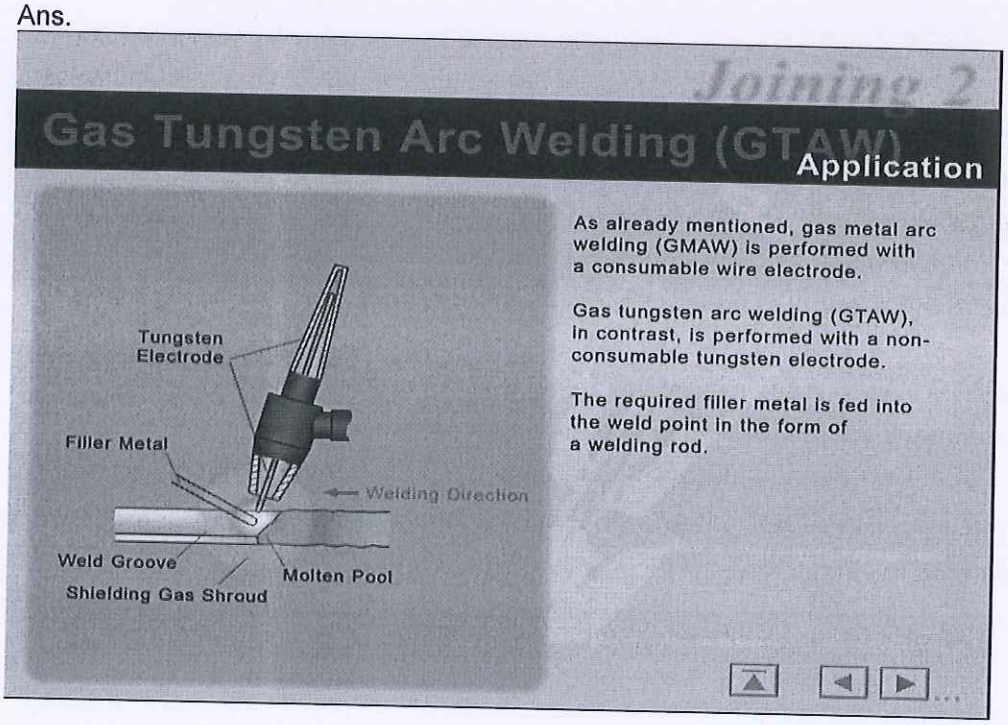


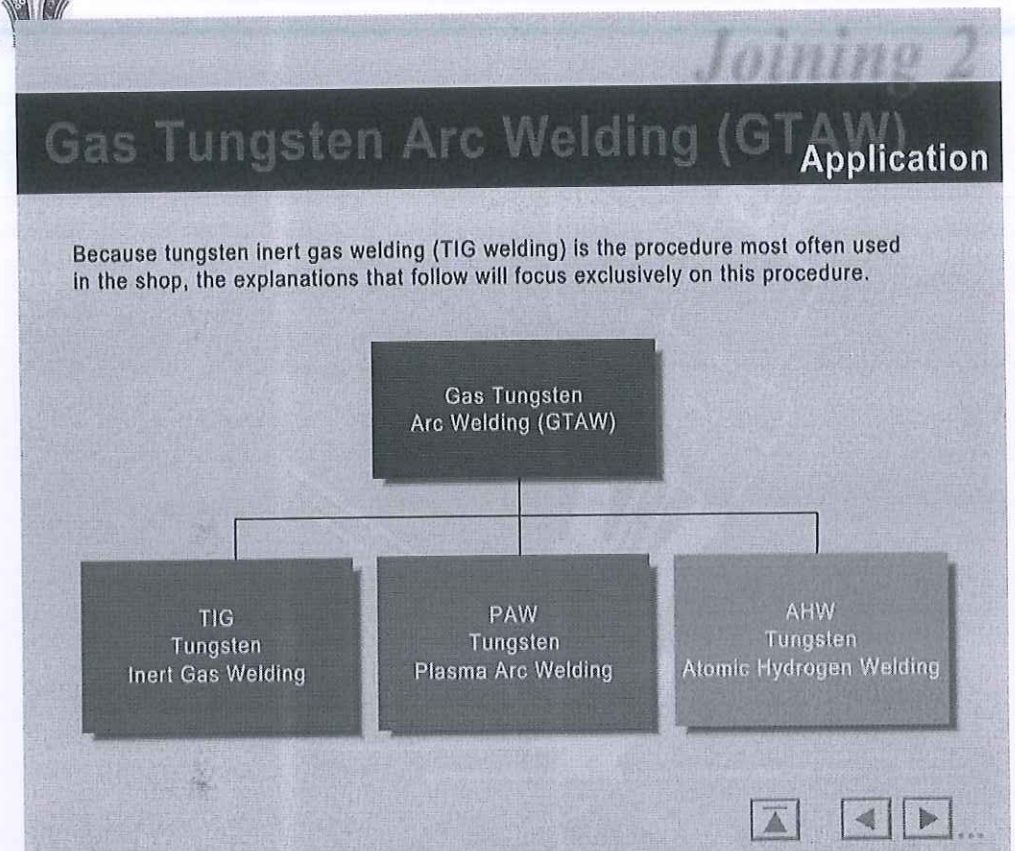
Section – C

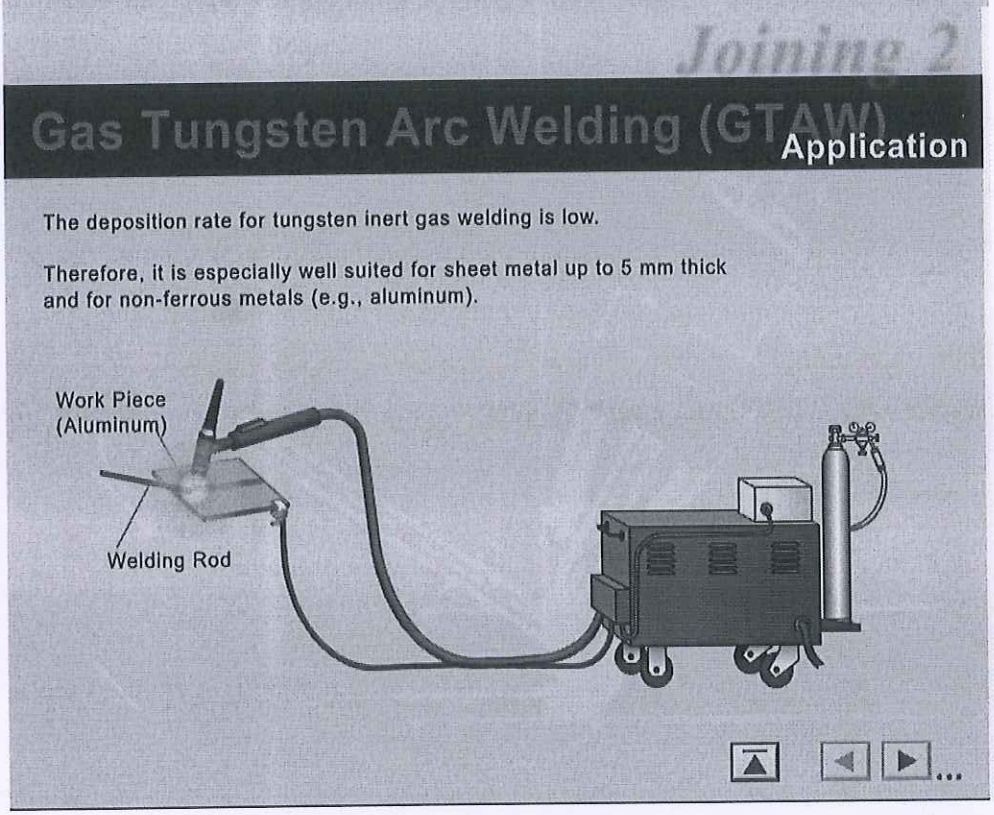
04X06 = 24 Marks

Q15. What are the applications of TIG welding?

Ans.







Q16. Compare TIG welding process in terms of advantage and disadvantages.

Ans. **Advantages of TIG:**

It doesn't require any flux and this is because of the inert gas shields molten metal. Therefore, there are no hassles with the slag and inclusion of slag.

This welding machine will easily provide you with high quality and strong welding finishes.

The welding work done with this welding machine will provide you with neat and appealing joints and many times, they don't need any finishing process to be done on them due to the excellent welding work done with the TIG.

One can easily weld a wide range of materials with TIG.

This welding machine requires the minimum amount of flames and also sparks.

The small heat zone ensures that there is less amount of distortion when working with this welding machine.

One can easily work with this welding machine in both manual and automatic.

This welding machine is suitable for work with very thin sections, as there is less amount of heat applied when welding.

This welding machine offers versatile options when welding with a wide range of materials.

Disadvantages of TIG:

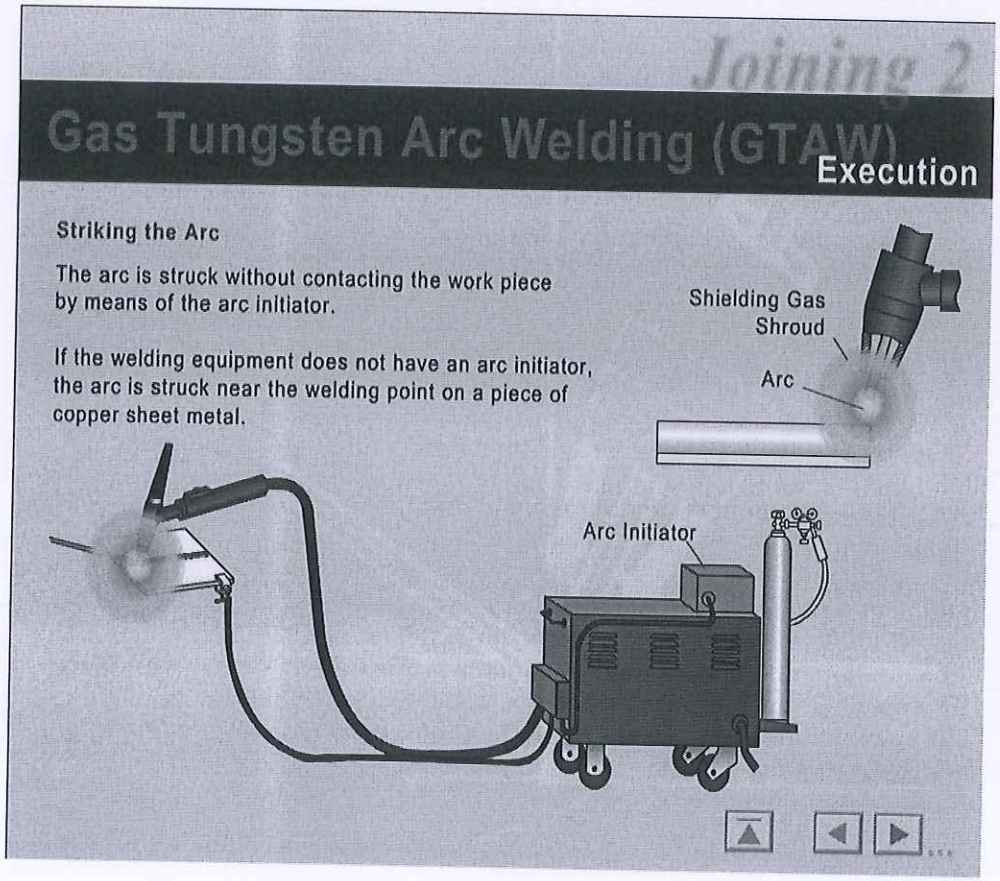
One can only weld thin materials with this welding machine. This is not suitable for the thick materials.

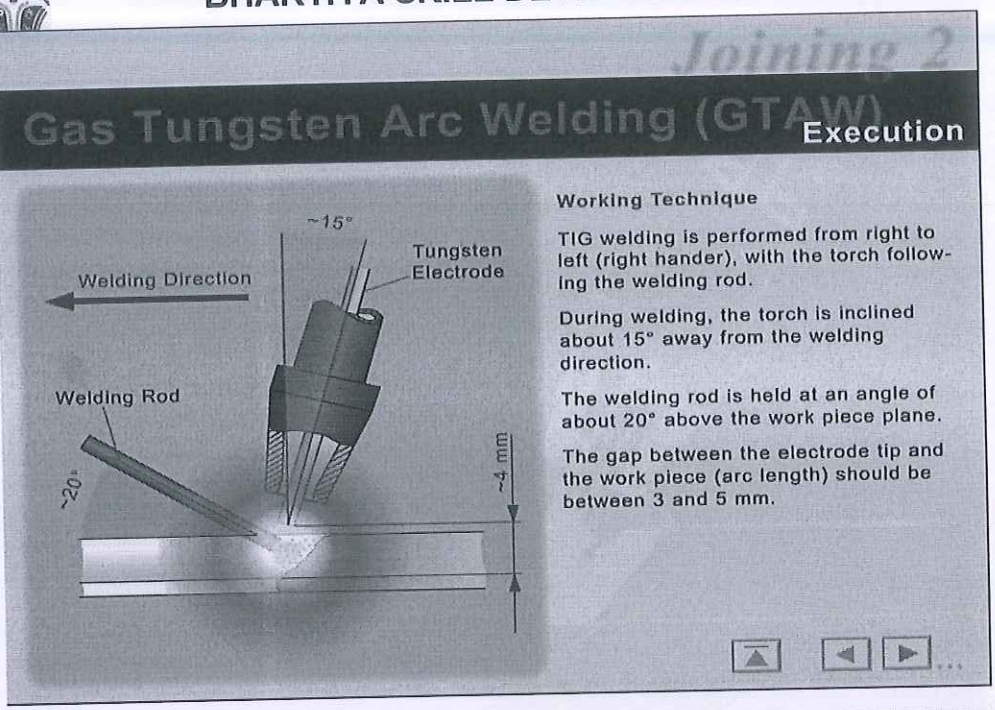
It will take a lot of time when welding. Welding with this welding machine is time consuming and the speed is slower than any other welding machines available in the market as well. It also has got lower filler deposition rate as well.

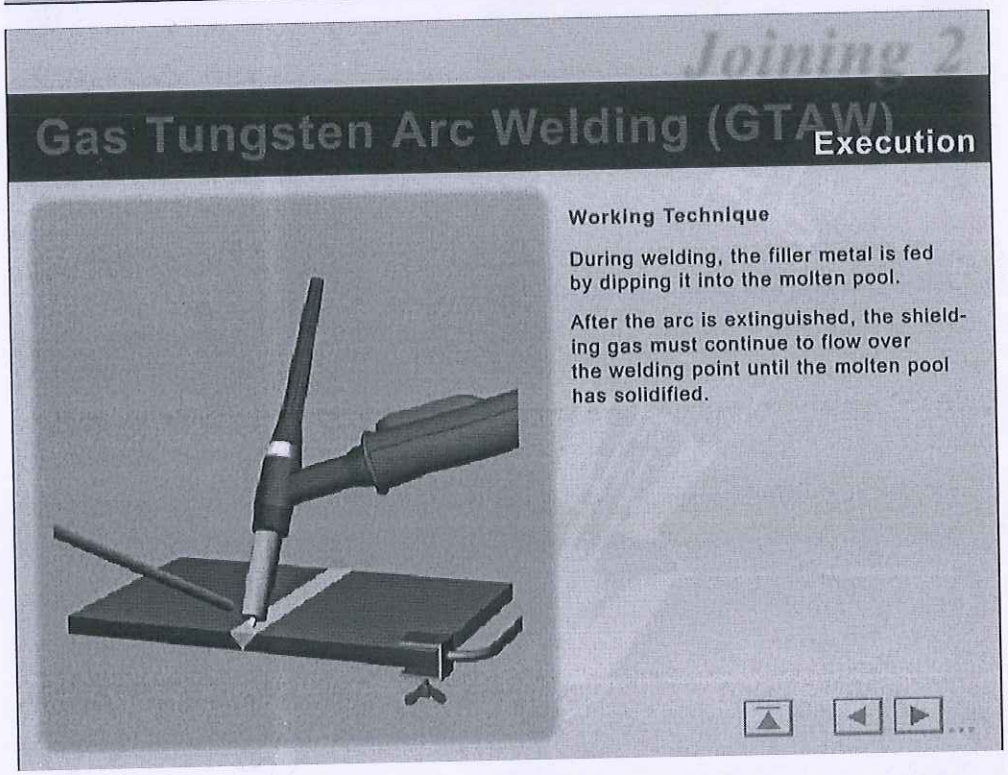
It has got high initial cost. It is quite complicated to be used and mostly used by the professionals and highly skilled welders.

Q17. Write the execution of TIG welding.

Ans.







Q18. Give the correct work technique with TIG

Ans. Complete beginners to TIG should begin on 2mm or 3mm steel. The weld pool is larger and easier to control on thicker steel which makes it easier to develop technique - trying to learn on thinner material will be more frustrating. We've used 2mm steel for this tutorial. The welder was set to 50 amps, and the tungsten and filler rod were both 1.6mm.

Setting up the machine and tungsten grinding and stick out are covered on the **TIG set up** page.

Advice on power settings for different steel thicknesses can be found on the **TIG Amp chart**.

Find a Steady Position

Torch Angle and Movement

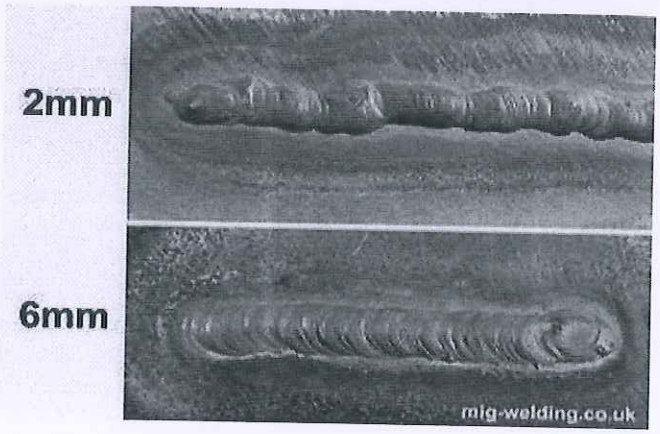
Learning to TIG Weld

Arc Length

Size and Speed

Feeding TIG Filler Rods

Struggling practice more and more



Next Step – make some different joints like butt weld

Vetted
Richa

A5, Set-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1105 **Time: 2 Hours**

Course Name: Inert Gas Welding (GMAW) **Max. Marks: 50**

Instruction:

Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q.1 Distortion in welding occurs due to.....

a.) Use of excessive current
b.) **Improper clamping methods**
c.) Use of wrong electrodes
d.) Oxidation of weld pool

Q2. What does GMAW stand for?

a.) **Gas metal arc welding**
b.) Gas moment arc welding
c.) Gas metal flow welding
d.) Oxy acetylene welding

Q3. Which of the following process use consumable electrode?

a) TIG welding
b) Spot resistance welding
c) MIG welding
d) Laser Welding

Q4. Which polarity MIG welding uses for mild steel

(A) DCEN
(B) AC
(C) **DCEP**
(D) all of the above

Q5. Which polarity is used in GMAW?

(A) DCEN
(B) AC
(C) **DCEP**
(D) all of the above

Q6. When should you wear your safety glasses?

(A) During grinding only

(B) During welding only

(C) Anywhere Every time in the workshop

(D) Behind the grinding person

Q7. Which of the carbon steel is most weld able

a) 0.15% C

b) 0.30% C

c) 0.50% C

d) 0.75%C

Q8. Welding voltage range for MIG/MAG welding in spray transfer

(A) 2v – 18v

(B) 31v - 54v

(C) **24v -30v**

(D) 54v – 75v

Q9. What is formula of gas flow setting?

(A) **10 x wire diameter**

(B) 12 x wire diameter

(C) 8 x wire diameter

(D) 2 x wire diameter

Q10. What type of power source is used in GMAW WELDING?

(A) Constant current

(B) **Constant voltage**

(C) Constant feed

(D) Constant electrode dia.

Section – B

04X04 = 16 Marks

Q11. Give the name and describe spare parts used in MIG/MAG welding as consumables.

Ans. 1. Drive rollers

2. Nozzle

3. Contact tip

4. Gas guide

5. Liner

6. Contact tip holder

Q12. Differentiate b/w MIG and MAG welding.

Ans. **The only difference between MIG and MAG is the type of shielding gas used.**

The make-up of the shielding gas is important as it has a significant effect on the stability of the arc, the metal transfer and the degree of spatter. The shielding gas also impacts the behavior of the weld pool, with particular regard to the penetration and mechanical properties of the welded joint.

Q13. Why we don't use pure $C0_2$ during MAG welding?

Ans. undoubtedly, **poor arc quality is the biggest drawback** to using 100% CO2.

Carbon dioxide's electrical conductivity is lower than Argon. When it is added to added argon, up to 25%, it helps to stabilize the arc.

Q14. Write advantage of MIG/MAG welding.

Ans. **M.I.G. and M.A.G.S. Advantages**

1) Higher welding speeds
2) Greater deposition rates
3) Less post welding cleaning (e.g. no slag to chip off weld)
4) Better weld pool visibility
5) No stub end losses or wasted man hours caused by changing electrodes
6) Low skill factor required to operate M.I.G / M.A.G.S welding torch
7) Positional welding offers no problems when compared to other processes. (Use dip or pulsed mode of transfer)
8) The process is easily automated
9) No fluxes required in most cases
10) Ultra low hydrogen process

Section – C

04X06 = 24 Marks

Q15. Write disadvantage of MIG/MAG welding.

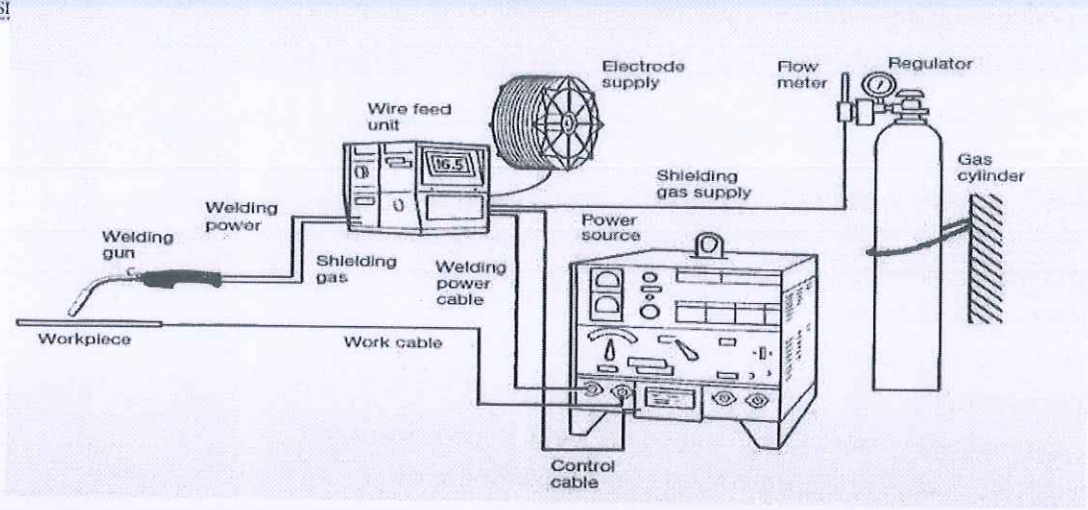
Ans. **M.I.G. and M.A.G.S. Disadvantages**

1) Higher initial setup cost
2) Atmosphere surrounding the welding process has to be stable (hence the shielding gasses), therefore this process is limited to draught free conditions
3) Higher maintenance costs due to extra electronic components
4) The setting of plant variables requires a high skill level
5) Less efficient where high duty cycle requirements are necessary
6) Radiation effects are more severe

Q16. Explain MIG and MAG welding in brief with the help of neat diagram.

Ans. MIG works on same principle of TIG or arc welding. It works on basic principle of heat generation due to electric arc. This heat is further used to melt consumable electrode and base plate's metal which solidify together and makes a strong joint. The shielded gases are also supplied through nozzle which protect the weld zone from other reactive gases. This gives good surface finish and a stronger joint.

Equipment's:



Power Source:

In this type of welding process, a DC power supply is used with reverse polarity. Reverse polarity means the electrode or in case of MIG welding electrode wire is connected positive terminal and work piece to negative terminal. It is due to principle of electric circuit which state that 70% of heat is always on positive side. So reverse polarity ensures that the maximum amount of heat liberate at tool side which melt the filler metal in proper way. Straight polarity can cause unstable arc that result into large spatter. The power source consist a power supply, a transformer, a rectifier which change AC into DC and some electronic controls which control the current supply according to weld requirement.

Q17. Describe the kind of material transfer in MIG/MAG welding.

Ans. MIG welding has four ways of transferring the wire to the joint.

- Short circuit
- Globular
- Spray
- Pulsed spray

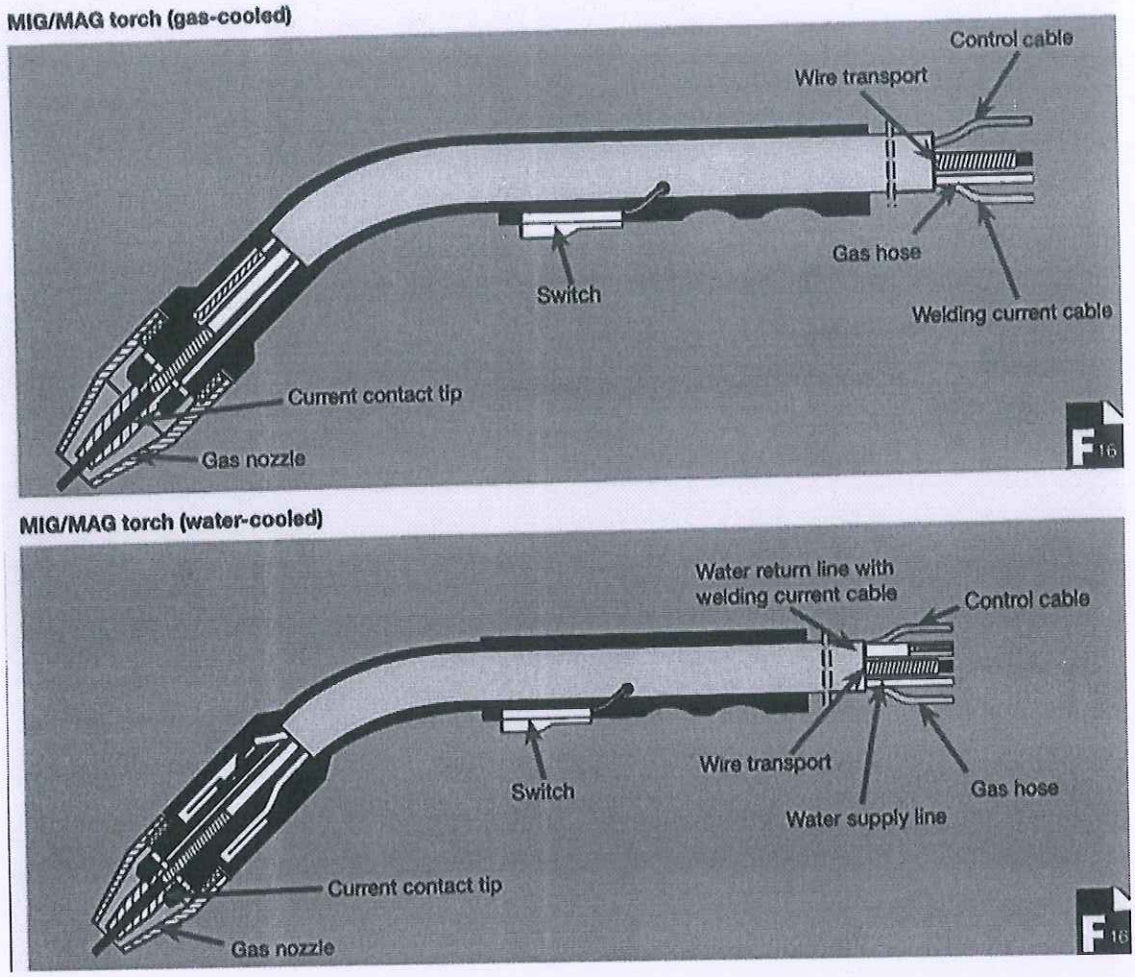
Short circuit transfer is a transfer used when a lower voltage is used for MIG welding. Short circuit transfer occurs when the wire contacts the metal creating short circuits. During this short circuit the wire contacting the metal heats up and melts into the joint by creating a puddle from contact. Then another contact begins and the process keeps repeating many times a second.

Globular transfer is similar to short circuit transfer. Globular transfer occurs when the wire arcs and it creates a glob that hangs off of the wire. Then the glob falls to the metal filling the joint and then the process begins again

Spray Transfer is a transfer where a higher voltage is applied and the electrode does not contact the metal. The transfer is exactly like it sounds. The wire sprays or has very fine mist transferring to the metal.

Q18. Draw labelled of MIG/MAG torch and explain two types of cooling.

Ans-



QP Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1105 Set B **Time: 2 Hours**

Course Name: Inert Gas Welding (GMAW) **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. Weld symbol for square butt joint is

(a) II (c) X

(b) V (d) O

Q2. Which of the carbon steel is most weld able

a) 0.15% C

b) 0.30% C

c) 0.50% C

d) 0.75%C

Q3. Welding voltage range for MIG/MAG welding in spray transfer

(a) 2v – 18v (c) 24v -30v

(b) 31v - 54v (d) 54v – 75v

Q4. Which of the following process use consumable electrode?

a) TIG welding

b) Spot resistance welding

c) MIG welding

d) Laser Welding

Q5. What is formula of gas flow setting?

(a) 10 x wire diameter (c) 8 x wire diameter

(b) 12 x wire diameter (d) 2 x wire diameter

Q6. What type of power source is used in GMAW WELDING?

(a) Constant current (c) Constant feed

(b) Constant voltage (d) Constant electrode dia.

Q7.Weld spatter is

(a) Flux (c) Welding defect

(b) Electrode coating (d) Welding test

Q8. Which of the following gas used to weld Aluminium in MIG welding

a) Pure argon
b) CO_2
c) Argon + CO_2
d) Nitrogen

Q9. Which of the following material transfer is not in MIG/MAG welding

a) Spray transfer
b) Short circuit transfer
c) Pinch transfer
d) Globular transfer

Q10. What is ISO code for Gas-less (self-shielded) Shielded flux cored arc welding?

a) 114
b) 141
c) 143
d) 311

Section – B

04X04 = 16 Marks

Q11. Write down ISO Codes for MIG, MAG and FCAW (with gas) welding.

Q12. Differentiate b/w MIG and MAG welding

Q13. What is the function of water cooling MIG/MAG welding?

Q14. What is FCAW? How this is different from MAG Welding.

Section – C

04X06 = 24 Marks

Q15. How can we use active gas like $C0_2$ in MAG welding?

Q16. Write advantage of MIG/MAG welding.

Q17. Describe the brief diagram of welding torch.

Q18. Describe in brief with diagram:

a) Pressure regulator b) Cylinder valve c) Gas preheater

Vetted

A.S. Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1105 **Time: 2 Hours**

Course Name: Inert Gas Welding (GMAW) **Max. Marks: 50**

Answer key

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 4 Marks.
5. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. Weld symbol for square butt joint is

(a) **II**
(b) V
(c) X
(d) O

Q2. Which of the carbon steel is most weld able

a) 0.15% C
b) 0.30% C
c) 0.50% C
d) 0.75%C

Q3. Welding voltage range for MIG/MAG welding in spray transfer

(a) 2v – 18v
(b) 31v - 54v
(c) **24v -30v**
(d) 54v – 75v

Q4. Which of the following process use consumable electrode?

a) TIG welding
b) Spot resistance welding
c) MIG welding
d) Laser Welding

Q5. What is formula of gas flow setting?

(a) **10 x wire diameter**
(b) 12 x wire diameter
(c) 8 x wire diameter
(d) 2 x wire diameter

Q6. What type of power source is used in GMAW WELDING?

(a) Constant current
(b) Constant voltage
(c) Constant feed
(d) Constant electrode dia.

Q7.Weld spatter is

(a) Flux
(b) Electrode coating
(c) **Welding defect**
(d) Welding test

Q8. Which of the following gas used to weld Aluminum in MIG welding

a) Pure argon
b) CO_2
c) Argon + CO_2
d) Nitrogen

Q9. Which of the following material transfer is not in MIG/MAG welding

a) Spray transfer
b) Short circuit transfer
c) Pinch transfer
d) Globular transfer

Q10. What is ISO code for Gas-less (self-shielded) Shielded flux cored arc welding?

a) 114
b) 141
c) 143
d) 311

Section – B

04X04 = 16 Marks

Q11. Write down ISO Codes for MIG, MAG and FCAW (with gas) welding.

Ans.

Gas-shielded Metal Arc Welding	
Metal Arc inert gas welding: MIG-welding	13
Metal Arc inert gas welding: MIG-welding	131
Metal Arc inert gas welding: MIG-welding	132
Metal Arc active gas welding: MAG-welding	133
Flux-cored arc welding with active gas shield	135
Metal Arc active gas welding: MAG-welding	136
	138

Q12. Differentiate b/w MIG and MAG welding

Ans. **The only difference between MIG and MAG is the type of shielding gas used.**

The make-up of the shielding gas is important as it has a significant effect on the stability of the arc, the metal transfer and the degree of spatter. The shielding gas also impacts the behavior of the weld pool, with particular regard to the penetration and mechanical properties of the welded joint.

Q13. What is the function of water cooling MIG/MAG welding?

Ans. The water system will remove heat from your tips and nozzles anywhere from 30 seconds to 2 minutes after you finish welding any length of time to the point of touch. (Don't recommend welding bare handed, though!). Your nozzles and tips will also last longer – sometimes at low amperages, too long, tips may reduce ability to conduct when used too long, to the point it could damage gun.
It's always recommended to change tips on days you weld or amount of wire used. Water-cooled guns are also surprisingly light weight; the liquid and the pressure flowing through the cable makes them somewhat buoyant. A water-cooled gun that's 500 amp, for instance, is about the same as 350 amp air-cooled gun.

Q14. What is FCAW? How this is different from MAG Welding.

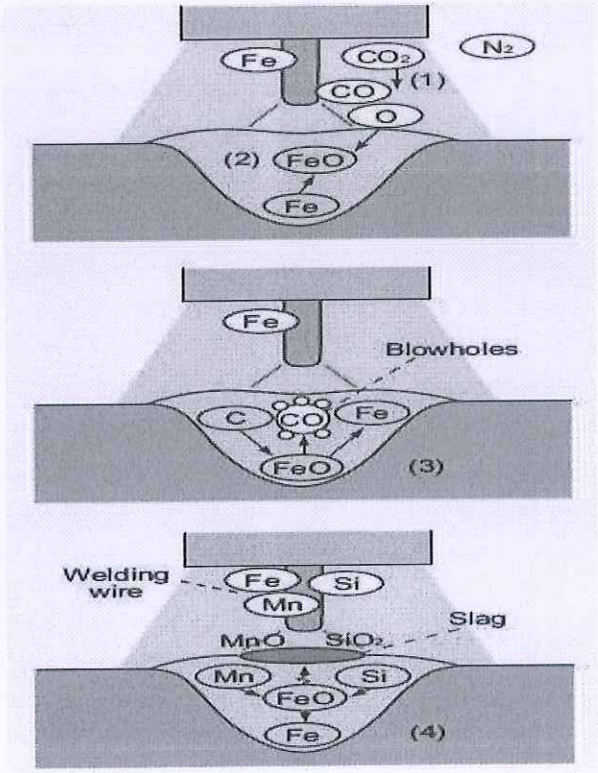
Ans. The main **difference** between **flux cored arc welding** and **GMAW welding** is the way the electrode is shielded from the air. **Flux cored arc welding** just like the name implies, has a hollow wire with **flux** in the center, just as the name states, a '**Flux** Core'.

Section – C

04X06 = 24 Marks

Q15. How can we use active gas like $C0_2$ in MAG welding?

Ans. Iron becomes brittle when it combines with nitrogen that exists much in the atmosphere.
CO2 gas, therefore, is often used to shield the weld pool from the atmosphere. CO2 gas can be decomposed by the ultra−high temperature arc heat into CO and O near the arc.



$$CO_2 \rightleftarrows CO + O \cdots (1)$$

The decomposed O combines with molten iron to form FeO.

Sequentially, C that is contained in steel is easier to combine with O than Fe deprives O from FeO to generate CO gas, which is apt to left in the weld metal to form blowholes. A weld metal that contains blowholes cannot be deemed to be sound.

To improve the soundness, a welding wire that contains Si and Mn that have stronger affinity with O is used; in this case, O in FeO combines not with C but with Si and Mn and floats up on the surface of the weld pool to form slag of SiO2 and MnO. Though slag is formed, the weld metal becomes sound without blowholes.

Besides Si and Mn that prevent blowholes, various other chemical elements are added to the welding wire in order to let the weld metal possess required strength, impact toughness, corrosion resistance and other properties

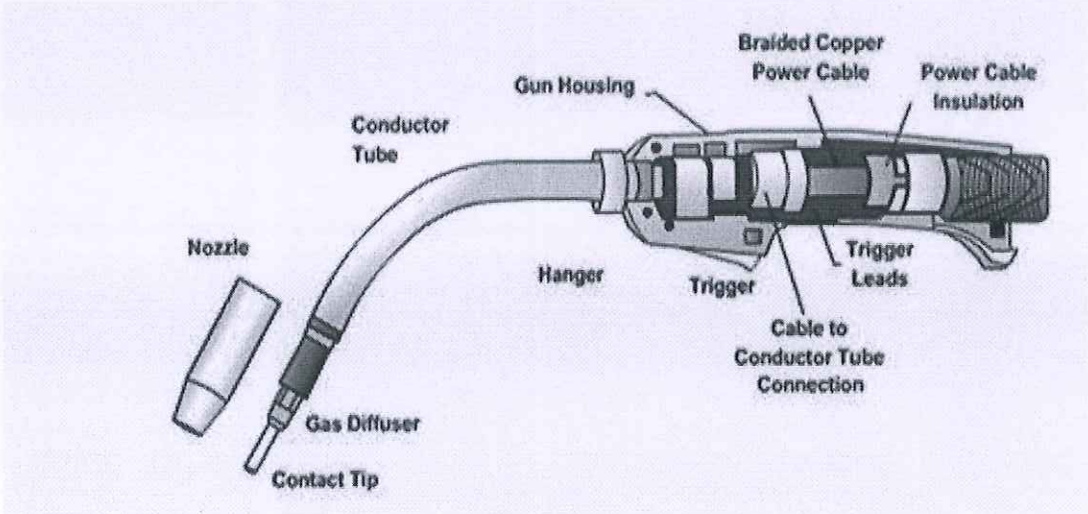
Q16. Write advantage of MIG/MAG welding.

Ans. **M.I.G. and M.A.G.S. Advantages**

1) Higher welding speeds
2) Greater deposition rates
3) Less post welding cleaning (e.g. no slag to chip off weld)
4) Better weld pool visibility
5) No stub end losses or wasted man hours caused by changing electrodes
6) Low skill factor required to operate M.I.G / M.A.G.S welding torch
7) Positional welding offers no problems when compared to other processes. (Use dip or pulsed mode of transfer)
8) The process is easily automated
9) No fluxes required in most cases
10) Ultra low hydrogen process

Q17. Describe the brief diagram of welding torch.

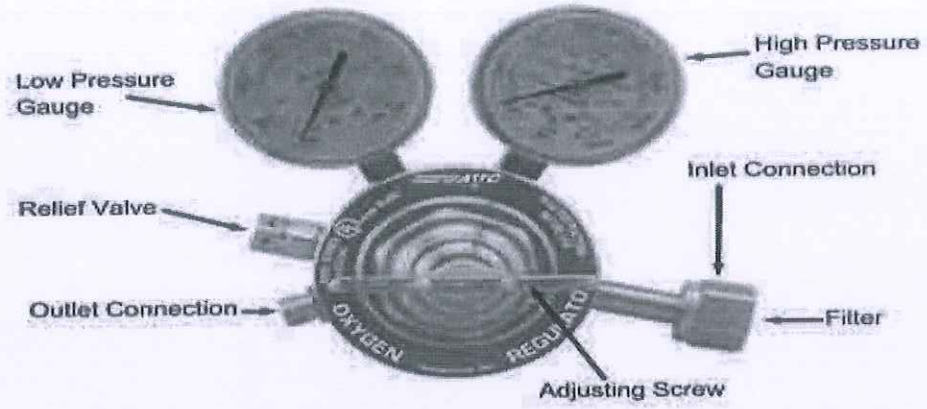
Ans.



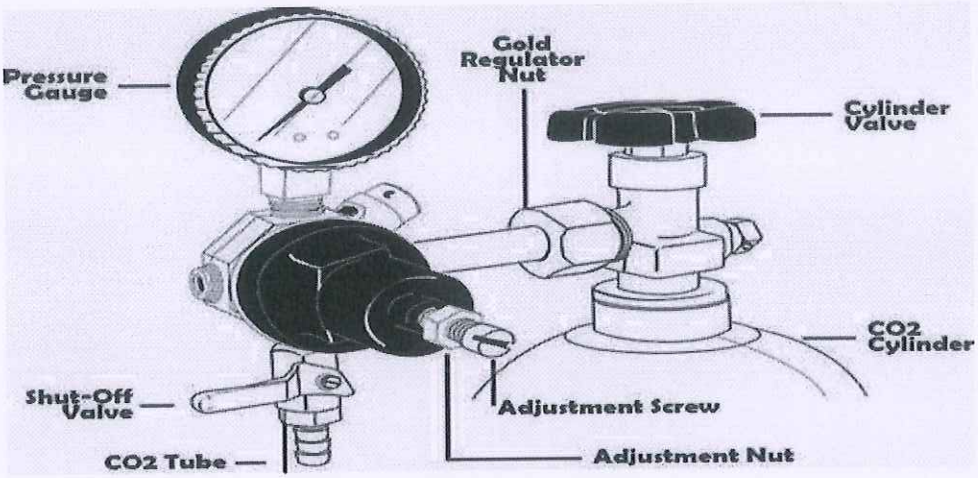
Q18. Describe in brief with diagram:

a) Pressure regulator b) Cylinder valve c) Gas preheater

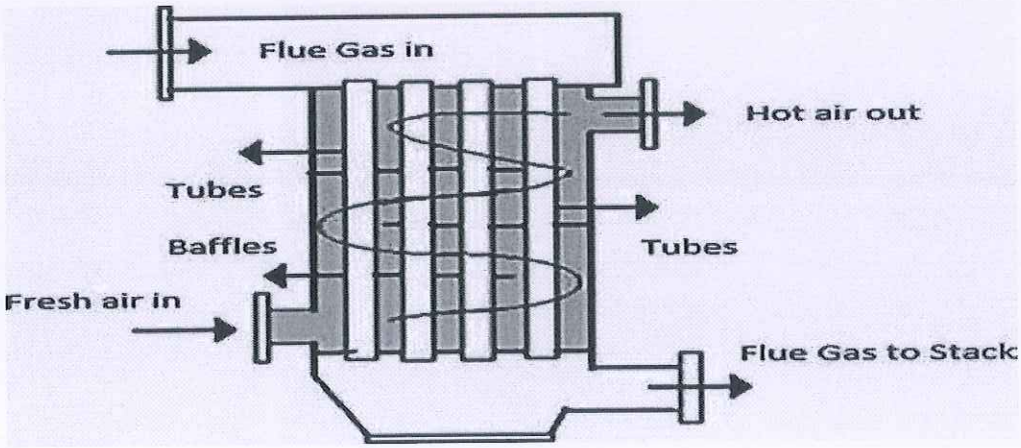
Ans. a) a pressure regulator is a **control valve that reduces the input pressure of a fluid to a desired Value as its output.**



(b) This valve **allows the cylinder to contain gases and allows gas to be filled into or emptied from the cylinder**



c) The **pre-heater** is used to **prevent the formation of hydrate** due to a pressure and temperature drop across the pressure regulator.



Vetted

QP. Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1106 Set A **Time: 2 Hours**

Course Name: Brazing/ Soldering/ Oxy-fuel processes **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The color of oxygen hose is

a) Blue
b) Red
c) Yellow
d) None the above

Q2. Following is (are) used as fuel gas (es)

(a) Acetylene
(b) Liquefied petroleum gas (LPG)
(c) Propane
(d) all of the above

Q3. Which of the following apparatus is used for Oxy-acetylene welding?

(a) Two pressure regulators, two flexible hoses, one torch
(b) One pressure regulators, two flexible hoses, one torch
(c) Two pressure regulators, one flexible hoses, and one torch
(d) One pressure regulators, one flexible hoses, one torch

Q4. Oxy-acetylene welding process is capable of making welds of

(a) Steel
(b) Alloy steels
(c) Cast iron
(d) all of the above

Q5. Which of the following types of fuel gas is commonly used in gas welding?

a) Biogas
b) Coal gas
c) Acetylene
d) Methane

Q6. Oxy-acetylene process is most suited for which of the following process of joining?
a) Metal wires
b) Metal sheets
c) Metal tubes
d) Thermit welding

Q7. In a neutral flame, what is the temperature in the inner core?
a) 3200°C
b) 2100°C
c) 1250°C
d) 2700°C

Q8. The distance from the center of arc to the tip of electrode is called what?
a) Arc distance
b) Arc length
c) Arc crater
d) Arc depth

Q9. The backhand technique is used for
a) More than 3mm
b) Less than 3mm
c) Equal to 3mm
d) All of the above

Q10. For what thickness of a material, in an oxy-acetylene is a welding rod used?
a) 10 mm
b) 15 mm
c) 20 mm
d) 25 mm

Section – B

04X04 = 16 Marks

Q11. Define the oxy-fuel gas welding?

Q12. What are the fuel gases which can be used in oxy-fuel process?

Q13. Write down difference between forehand and backhand welding.

Q14. Write down about the neutral flame with diagram.

Section – C

04X06 = 24 Marks

Q15. Explain following terms in detail

a) Neutral flame
b) Oxygen excess
c) Acetylene Excess

Q16. What do you understand by work-piece preparation? And how to select welding nozzle and filler metal.

Q17. Explain the pressure regulator in detail

Q18. How to store fuel gases in the cylinders? Explain acetylene cylinder.

Vetted

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1106 **Time: 2 Hours**

Course Name: Brazing/ Soldering/ Oxy-fuel processes **Max. Marks: 50**

Instruction:

Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The color of oxygen hose is

a) Blue
b) Red
c) Yellow
d) None the above

Ans. A

Q2. Following is (are) used as fuel gas (es)

(a) Acetylene
(b) Liquefied petroleum gas (LPG)
(c) Propane
(d) all of the above

Ans. D

Q3. Which of the following apparatus is used for Oxy-acetylene welding?

(a) Two pressure regulators, two flexible hoses, one torch
(b) One pressure regulators, two flexible hoses, one torch
(c) Two pressure regulators, one flexible hoses, and one torch
(d) One pressure regulators, one flexible hoses, one torch

Ans. A

Q4. Oxy-acetylene welding process is capable of making welds of

(a) Steel
(b) Alloy steels
(c) Cast iron
(d) all of the above

Ans. D

Q5. Which of the following types of fuel gas is commonly used in gas welding?

a) Biogas

b) Coal gas

c) Acetylene

d) Methane

Ans. C

Q6. Oxy-acetylene process is most suited for which of the following process of joining?

a) Metal wires

b) Metal sheets

c) Metal tubes

Ans. B

Q7. In a neutral flame, what is the temperature in the inner core?

a) 3200°C

b) 2100°C

c) 1250°C

d) 2700°C

Ans. A

Q8. The distance from the center of arc to the tip of electrode is called what?

a) Arc distance

b) Arc length

c) Arc crater

d) Arc depth

Ans. B

Q9. The backhand technique is used for

a) More than 3mm

b) Less than 3mm

c) Equal to 3mm

d) All of the above

Ans. A

Q10. For what thickness of a material, in an oxy-acetylene is a welding rod used?

a) 10 mm

b) 15 mm

c) 20 mm

d) 25 mm

.Ans. B

Section – B

04X04 = 16 Marks

Q11. Define the oxy-fuel gas welding?

Ans.

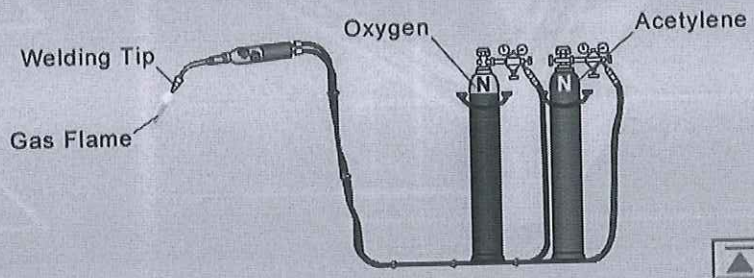
Joining 2

Oxyfuel Gas Welding (OFW) Definition

During oxyfuel gas welding, a gas flame is used to generate the heat needed to melt the materials.

The required temperature of up to 3200 °C is reached by burning a fuel gas (acetylene) with pure oxygen.

The two gases are mixed together in a specific proportion directly in the welding torch, and then ignited just in front of the welding tip.

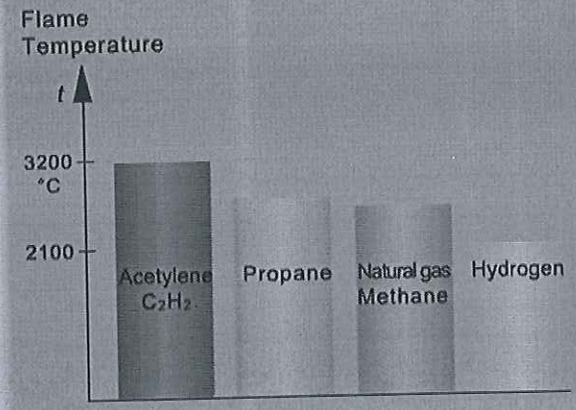


Q12. What are the fuel gases which can be used in oxy-fuel process?

Ans.

Joining 2

Oxyfuel Gas Welding (OFW) Welding Gases



Fuel Gases

The flame temperatures required for welding can only be reached by burning the fuel gas with pure oxygen.

In addition to acetylene, propane, methane and hydrogen are also used as fuel gases.

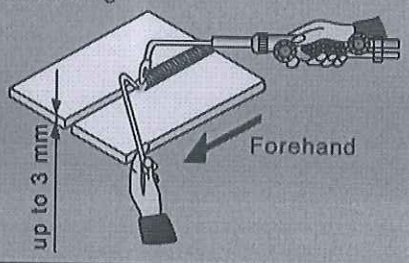
Because acetylene, however, burns with the highest flame temperature and can be inexpensively produced, it is the fuel gas of choice.

Q13. Write down difference between forehand and backhand welding.

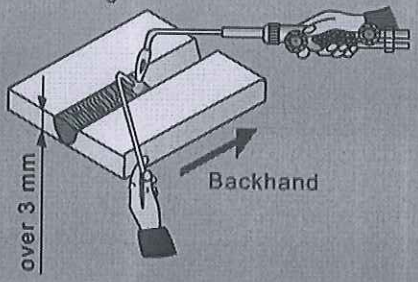
Ans.

Oxyfuel Gas Welding (OFW) Execution

Forehand Welding



Backhand Welding



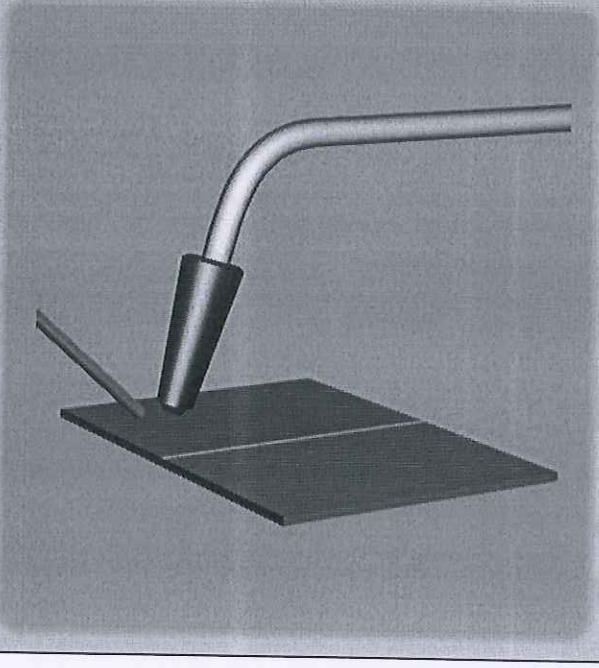
Working Technique

Depending on the direction the torch and welding rod are guided, the technique is described as either forehand or backhand welding.

During forehand welding, the joint area is not heated up as much. Therefore, this technique is used with thin sheet metal, up to 3 mm thick.

When the sheet metal is more than 3 mm thick, then the backhand technique is used.

Oxyfuel Gas Welding (OFW) Execution



Forehand Welding (FH-Welding)

During forehand welding, the welding torch follows the welding rod with a slight oscillating motion.

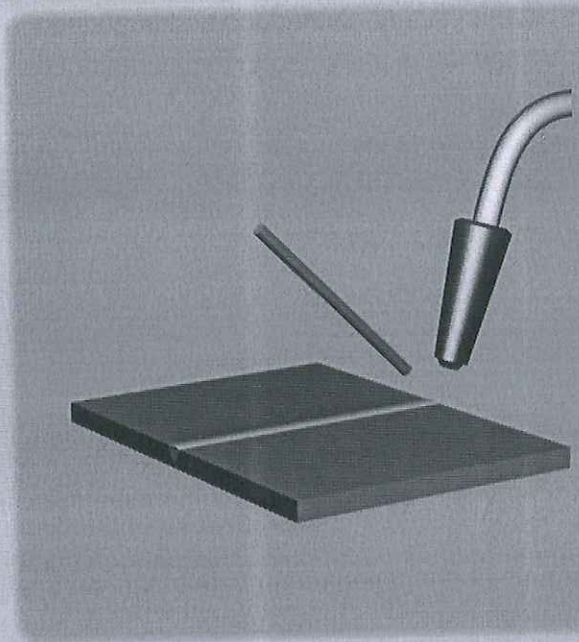
This causes the rod to melt off in the form of drops.

During forehand welding, the flame is directed away from the welded area, which allows the seam to cool more quickly.

This is desirable for thin work pieces, up to 3 mm thick.

Joining 2

Oxyfuel Gas Welding (OFW) Execution



Backhand Welding (BH-Welding)

During backhand welding, the welding rod follows the welding torch, which is carefully guided in a straight line.

This means that the flame is aimed directly at the welded area, thus heating up the base material to a higher temperature and causing it to cool down more slowly.

The welding rod is melted into the liquid base material with a circular motion.

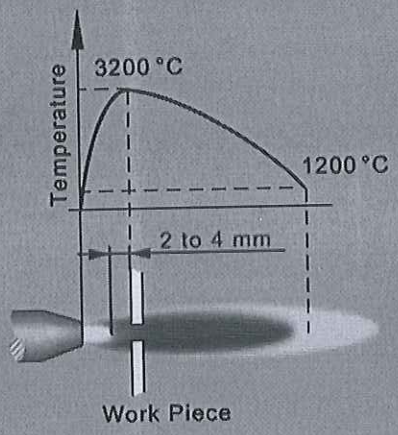
Backhand welding results in a very thorough weld, all the way down to the root.

Q14. Write down about the neutral flame with diagram.

Ans.

Joining 2

Oxyfuel Gas Welding (OFW) Preparation



Neutral Flame

The maximum temperature of 3200 °C is only reached in close proximity to the flame cone.

Therefore, as much as possible, you must maintain a consistant distance of 2 to 4 mm between the flame cone and the work piece during welding.

Section – C

04X06 = 24 Marks

Q15. Explain following terms in detail

a) Neutral flame
b) Oxygen excess
c) Acetylene Excess

Ans. The Neutral Flame

The neutral flame has a one-to-one ratio of acetylene and oxygen. It obtains additional oxygen from the air and provides complete combustion. It is generally preferred for welding.

The neutral flame has a clear, well-defined, or luminous cone indicating that combustion is complete.

Neutral welding flames are commonly used to weld:

- Mild steel
- Stainless steel
- Cast Iron
- Copper
- Aluminum

The welding flame should be adjusted to neutral before either the carburizing or oxidizing flame mixture is set.

There are two clearly defined zones in the neutral flame.

1. The inner zone consists of a luminous cone that is bluish-white.
2. Surrounding this is a light blue flame envelope or sheath.

This neutral flame is obtained by starting with an excess acetylene flame in which there is a "feather" extension of the inner cone. When the flow of acetylene is decreased or the flow of oxygen increased the feather will tend to disappear. The neutral flame begins when the feather disappears.

The neutral or balanced flame is obtained when the mixed torch gas consists of approximately one volume of oxygen and one volume of acetylene. It is obtained by gradually opening the oxygen valve to shorten the acetylene flame until a clearly defined inner cone is visible.

For a strictly neutral flame, no whitish streamers should be present at the end of the cone. In some cases, it is desirable to leave a slight acetylene streamer or "feather" 1/16 to 1/8 in. (1.6 to 3.2 mm) long at the end of the cone to ensure that the flame is not oxidizing.

This flame adjustment is used for most welding operations and for preheating during cutting operations. When welding steel with this flame, the molten metal puddle is quiet and clear. The metal flows easily without boiling, foaming, or sparking.

In the neutral flame, the temperature at the inner cone tip is approximately 5850°F (3232°C), while at the end of the outer sheath or envelope the temperature drops to approximately 2300°F (1260°C). This variation within the flame permits some temperature control when making a weld. The position of the flame to the molten puddle can be changed, and the heat controlled in this manner.

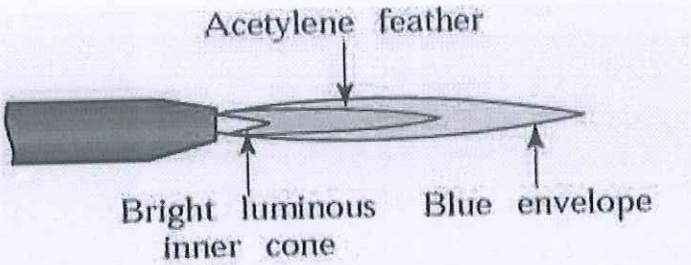


Figure 2: Carburizing Flame

Components of a Carburizing Welding Flame

The Carburizing Flame

The carburizing flame has excess acetylene, the inner cone has a feathery edge extending beyond it.

This white feather is called the acetylene feather.

If the acetylene feather is twice as long as the inner cone it is known as a 2X flame, which is a way of expressing the amount of excess acetylene. The carburizing flame may add carbon to the weld metal.

Reducing or carburizing welding flames are obtained when slightly less than one volume of oxygen is mixed with one volume of acetylene.

This flame is obtained by first adjusting to neutral and then slowly opening the acetylene valve until an acetylene streamer or "feather" is at the end of the inner cone.

The length of this excess streamer indicates the degree of flame carburization. For most welding operations, this streamer should be no more than half the length of the inner cone.

The reducing or carburizing flame can always be recognized by the presence of three distinct flame zones. There is a clearly defined bluish-white inner cone, white intermediate cone indicating the amount of excess acetylene, and a light blue outer flare envelope. This type of flare burns with a coarse rushing sound. It has a temperature of approximately 5700°F (3149°C) at the inner cone tips.

When a strongly carburizing flame is used for welding, the metal boils and is not clear. The steel, which is absorbing carbon from the flame, gives off heat. This causes the metal to boil. When cold, the weld has the properties of high carbon steel, being brittle and subject to cracking.

A slight feather flame of acetylene is sometimes used for back-hand welding. A carburizing flame is advantageous for welding high carbon steel and hard facing such nonferrous alloys as nickel and Monel. When used in silver solder and soft solder operations, only the intermediate and outer flame cones are used. They impart a low temperature soaking heat to the parts being soldered.

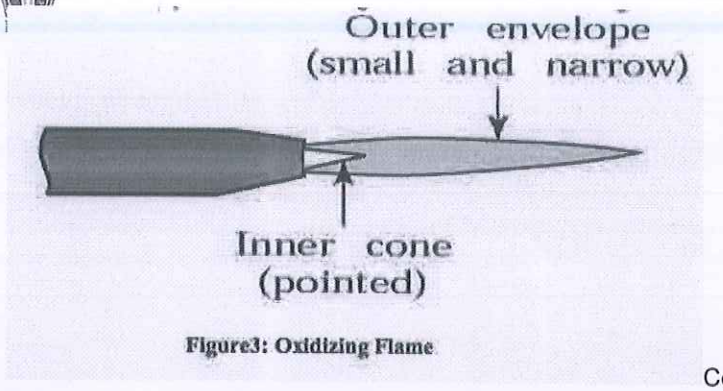


Figure3: Oxidizing Flame

Components of an Oxidizing Welding Flame

The Oxidizing Flame

Oxidizing welding flames are produced when slightly more than one volume of oxygen is mixed with one volume of acetylene.

To obtain this type of flame, the torch should first be adjusted to a neutral flame. The flow of oxygen is then increased until the inner cone is shortened to about one-tenth of its original length. When the flame is properly adjusted, the inner cone is pointed and slightly purple.

An oxidizing flame can also be recognized by its distinct hissing sound. The temperature of this flame is approximately 6300°F (3482°C) at the inner cone tip.

Oxidizing welding flames are commonly used to weld these metals:

- zinc
- copper
- manganese steel
- cast iron

When applied to steel, an oxidizing flame causes the molten metal to foam and give off sparks. This indicates that the excess oxygen is combining with the steel and burning it.

An oxidizing flame should not be used for welding steel because the deposited metal will be porous, oxidized, and brittle. This flame will ruin most metals and should be avoided.

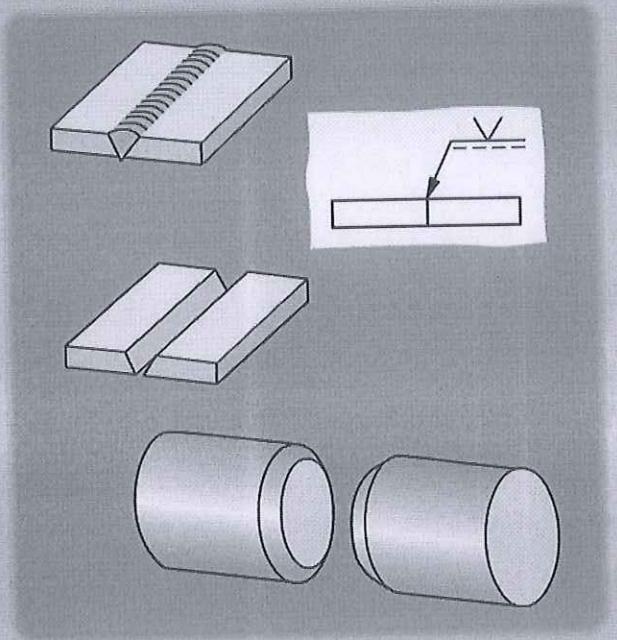
A slightly oxidizing flame is used in torch brazing of steel and cast iron. A stronger oxidizing flame is used in the welding of brass or bronze.

In most cases, the amount of excess oxygen used in this flame must be determined by observing the action of the flame on the molten metal.

Q16. What do you understand by work-piece preparation? And how to select welding nozzle and filler metal.

Oxyfuel Gas Welding (OFW)

Preparation



Work Pieces

The seam shape you have chosen or that has been prescribed for you in the blue print determines how the groove is to be configured.

The groove can be prepared by oxygen cutting or by a metal removal procedure such as milling, grinding or turning.

Before welding, the seam area is first cleaned of dirt, rust, scale, oil and paint by means of a wire brush, for example.

Joining 2

Oxyfuel Gas Welding (OFW)

Preparation

Selecting a Welding Nozzle

The size of the welding nozzle to be used is based on the thickness of the work piece.

The nozzles are clearly labeled to allow you to quickly and reliably choose the one you need.

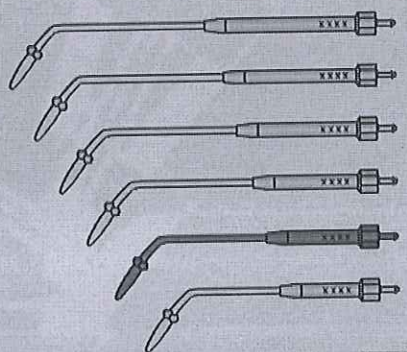
Size	Nominal Range (Sheet Metal)		
1	0.5 mm	to	1 mm
2	1 mm	to	2 mm
3	2 mm	to	4 mm
4	4 mm	to	6 mm
5	6 mm	to	9 mm
6	9 mm	to	14 mm

A = Welding nozzle suitable also for acetylene

2 = Size 2 welding nozzle

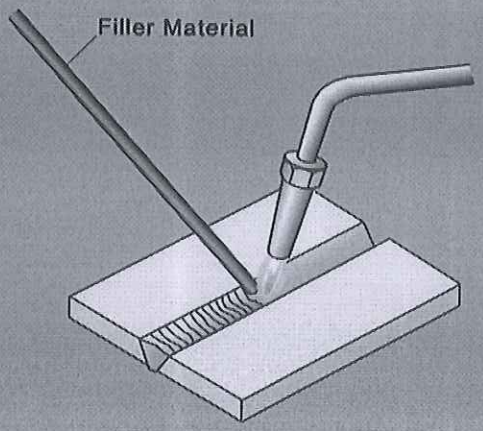
2.5 bar = Oxygen pressure must be 2.5 bars

1-2 mm = Welding nozzle for 1 to 2 mm thick sheet metal



Oxyfuel Gas Welding (OFW)

Preparation



Selecting a Filler Metal

Usually, the work piece material itself is insufficient to fill in the weld groove.

A filler metal in the form of a rod is therefore melted into the groove in order to fill it in.

The rod is coated with a thin layer of copper to protect it against corrosion.

Joining 2

Oxyfuel Gas Welding (OFW)

Preparation

Base Material	Welding Rod Classes, Categories					
	GI	GII	GIII	GIV	GV	GVI
...S235 (St37-2)	X	X	X	X		
...S275JR (St44-2)		X	X	X		
...S355JR (St52-2)			X	X		
16Mo3				X		
13CrMo4-5					X	
10CrMo9-10						X
	—					
		Grey Golden		Red	Yellow	Green

Selecting a Filler Metal

The appropriate filler metal is chosen with the help of tables.

When making your choice, note that the properties of the filler metal, such as strength, toughness, hardness and corrosion resistance, should match as closely as possible those of the base material.

Welding rods are divided into different classes.

These are identified by a color code.

The abbreviation is also stamped on the rod.

Q17. Explain the pressure regulator in detail

Ans.

Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

Pressure Regulator

It is not possible to weld with the high cylinder pressures of up to 200 bars (oxygen) and 19 bars (acetylene).

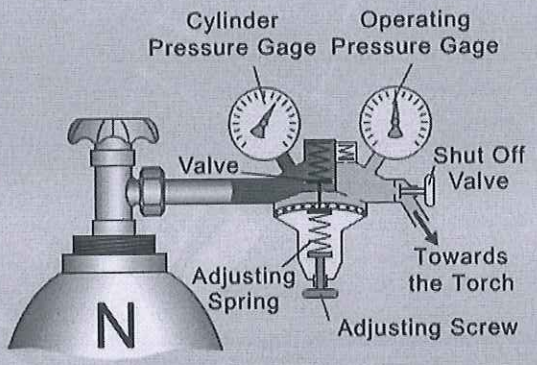
It is the function of the pressure regulator, therefore, to reduce the cylinder pressure to the so-called operating pressure and hold it constant.

Pressure regulators have two manometers (pressure gages).

The cylinder pressure gage displays the pressure inside the cylinder.

The operating pressure gage, in contrast, displays the substantially lower operating pressure.

This can be set by means of an adjusting screw.



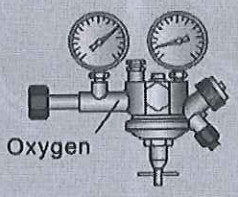
Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

Pressure Regulator

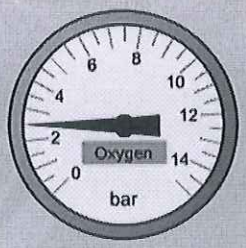
To make absolutely sure that pressure regulators for oxygen and acetylene cylinders are not accidentally reversed, they are equipped with different cylinder and hose connections.

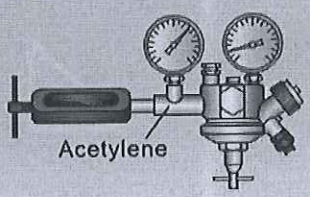
In addition, the name of the gas is printed on each one.



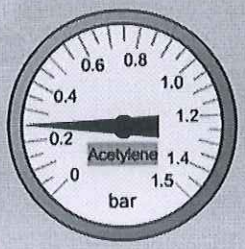
Operating Pressure:

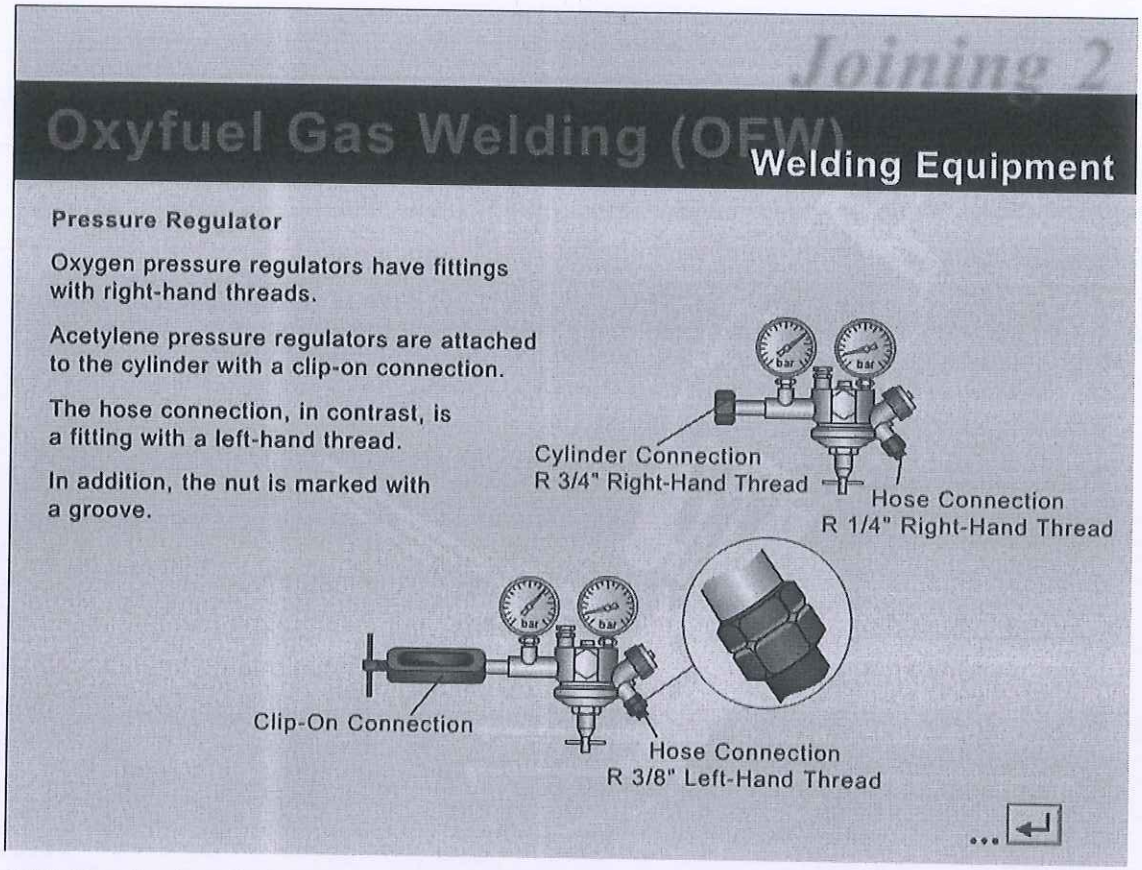
Oxygen → approx. 2.5 bar





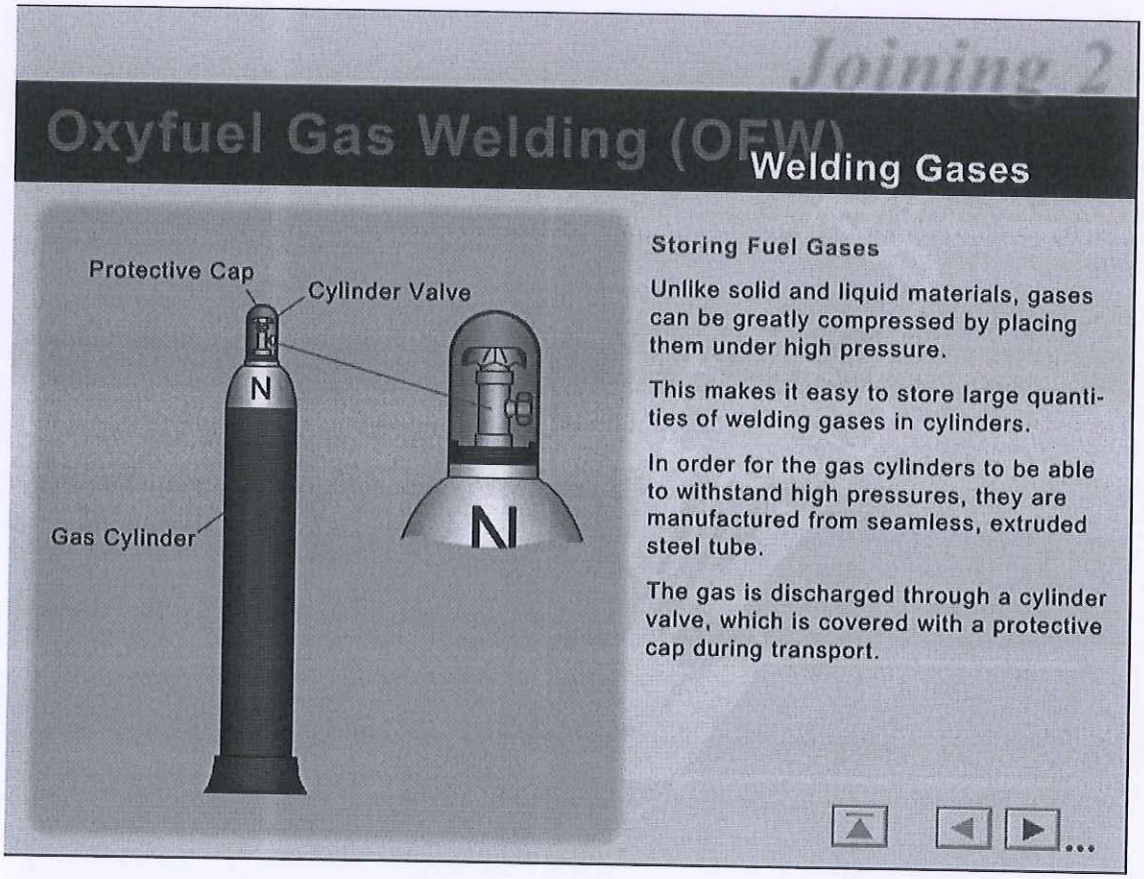
Acetylene → approx. 0.25 bar





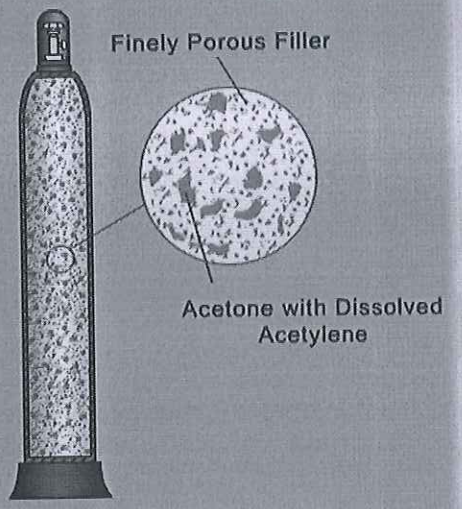
Q18. How to store fuel gases in the cylinders? Explain acetylene cylinder.

Ans.



Oxyfuel Gas Welding (OFW)

Welding Gases



Acetylene

Acetylene explodes when it is compressed to only 2 bars.

Therefore, the maximum allowable pressure for acetylene is only 1.5 bars.

To make it possible, nevertheless, to store larger quantities of acetylene in cylinders, the acetylene is dissolved in a carrier fluid (acetone).

Under pressure, acetone absorbs large quantities of acetylene. The acetylene is released again as the pressure falls during gas withdrawal.

In this way, it is possible to safely charge the cylinders to pressures up to 19 bars.

Joining 2

Oxyfuel Gas Welding (OFW)

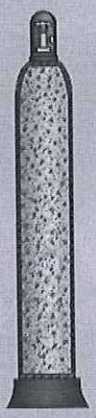
Welding Gases

Acetylene

An acetylene cylinder has a pressure of 18 bars and contains 16 liters of acetone.

The volume of acetylene contained under normal ambient pressure can be determined as follows:

At 15 °C, each liter of acetone absorbs approximately 25 liters of acetylene for each increase in pressure of 1 bar.



$$16\,l\ (\text{Acetone}) \cdot \frac{25\,l\ (\text{Acetylene})}{1\,l\ (\text{Acetone}) \cdot 1\ \text{bar}} \cdot 18\ \text{bar (Pressure)} = 7200\,l\ (\text{Acetylene})$$

$$= 7.2\ m^3\ (\text{Acetylene})$$

Vetted Rithinkas

QP Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination Set B

Course Code: MCS1106 **Time: 2 Hours**

Course Name: Brazing/ Soldering/ Oxy-fuel processes **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The correct flame for preheating before cutting is

a) Oxidizing flame
b) Carburizing flame
c) Neutral flame
d) None of the above

Q2. Neutral flame in gas welding contains

a) Oxygen and acetylene in equal proportion
b) More oxygen than acetylene
c) Less oxygen than acetylene
d) None of the above

Q3. The correct color for acetylene hose

a) Red
b) Blue
c) White
d) None of the above

Q4. In which of the following type of flame, oxygen is in excess proportion with acetylene?

a) Neutral flame
b) Oxidizing flame
c) Carburizing flame
d) Both oxidizing flame and carburizing flame

Q5. The chemical formula of acetylene is?

a) C2H4
b) C2H6

c) C2H5OH

d) C2H2

Q6. Which of the following is also called "gas welding"?

a) Oxy fuel gas welding

b) Metallic welding

c) Arc welding

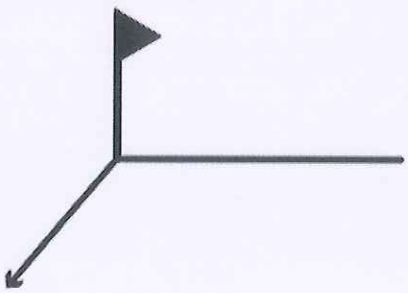
d) Fuel gas welding

Q7. What is the welding code for oxy acetylene welding?

a.) 111 b.) 131

c.) 311 d.) 136

Q8. What is the meaning of given symbol?



a.) Construction site weld b.) peripheral weld

c.) Before weld d.) Without weld

Q9. Why we use Acetone in Acetylene gas cylinder?

a) It absorb acetylene b) It absorb oxygen

c) It improve the quality of flux d) It gives additional strength to cylinder

Q10. What is the pressure where acetylene can explode?

a.) 0.25 bar b.) 0.5 bar

c.) 1.5 bar d.) 2.0 bar

Section – B

04X04 = 16 Marks

Q1. Write short note on oxygen cylinder in oxy-acetylene welding.

Q12. Write-down the steps to set the flame.

Q13. What is control valve? Write short note on control valve use.

Q14. How to prepare workpiece for brazing?

Section – C

04X06 = 24 Marks

Q15. What do you understand by gas hoses? Make the diagram of welding set-up.

Q16. Write down occupational safety for oxy-fuel gas welding.

Q17. Why we use pressure regulators, explain in detail

Q18. What is tacking? Why we tack the work-piece before welding. Explain with examples.

Vetted

A.S Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1106 **Time: 2 Hours**

Course Name: Brazing/ Soldering/ Oxy-fuel processes **Max. Marks: 50**

Instruction:

Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. The correct flame for preheating before cutting is

a) Oxidizing flame
b) Carburizing flame
c) Neutral flame
d) None of the above

Ans. C

Q2. Neutral flame in gas welding contains

a) Oxygen and acetylene in equal proportion
b) More oxygen than acetylene
c) Less oxygen than acetylene
d) None of the above

Ans. A

Q3. The correct color for acetylene hose

a) Red
b) Blue
c) White
d) None of the above

Ans. A

Q4. In which of the following type of flame, oxygen is in excess proportion with acetylene?

a) Neutral flame
b) Oxidizing flame
c) Carburizing flame
d) Both oxidizing flame and carburizing flame

Ans. B

Q5. The chemical formula of acetylene is?

a) C2H4

b) C2H6

c) C2H5OH

d) C2H2

Ans. D

Q6. Which of the following is also called "gas welding"?

a) Oxy fuel gas welding

b) Metallic welding

c) Arc welding

d) Thermit welding

Ans. A

Q7. What is the welding code for oxy acetylene welding?

a. 111

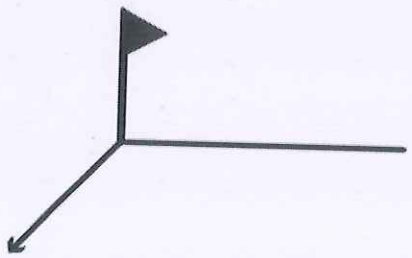
b. 131

c.311

d. 136

Ans. C

Q8. What is the meaning of given symbol?



a.) Construction site weld

b.) peripheral weld

c.) Before weld

d.) Without weld

Ans. A

Q9. Why we use Acetone in Acetylene gas cylinder?

a) It absorb acetylene

b) It absorb oxygen

c) It improve the quality of flux

d) It gives additional strength to cylinder

Ans. A

Q10. What is the pressure where acetylene can explode?

a.) 0.25 bar

b.) 0.5 bar

c.) 1.5 bar

d.) 2.0 bar

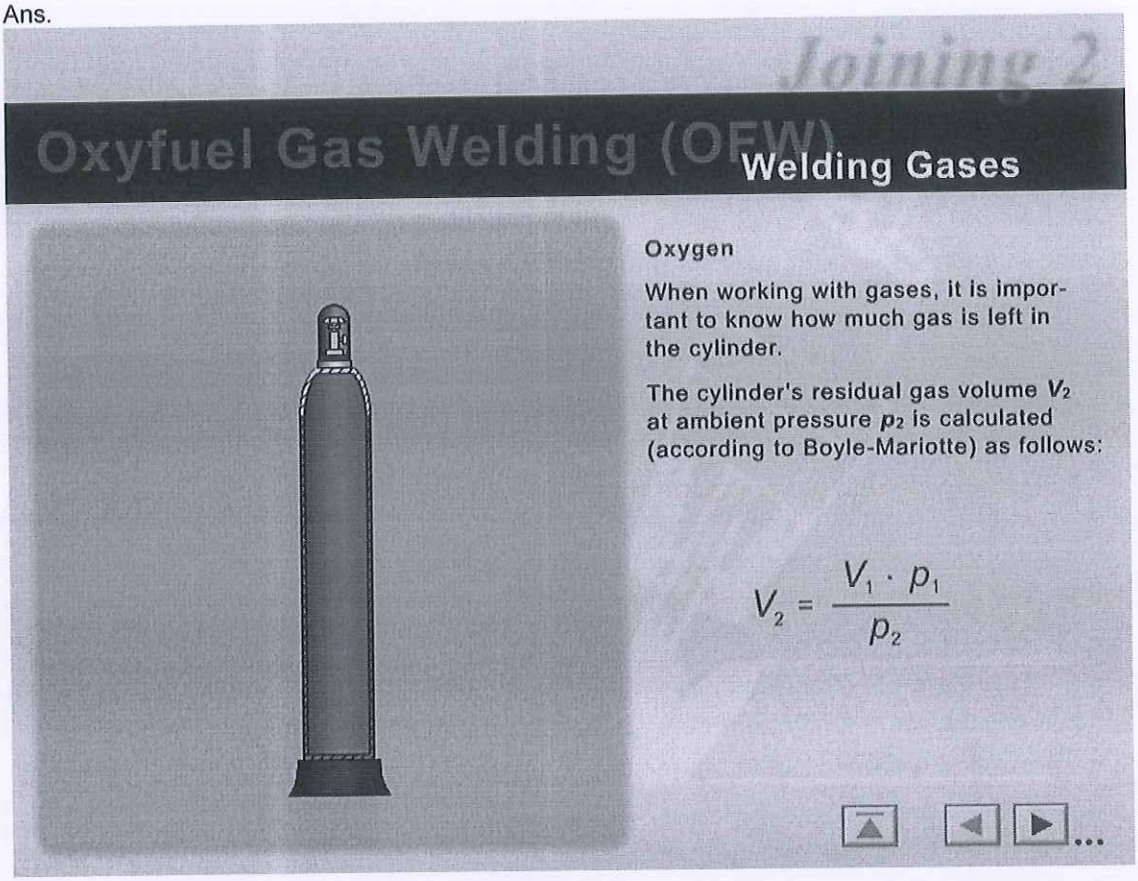
Ans. C

Section – B

04X04 = 16 Marks

Q11. Write short note on oxygen cylinder in oxy-acetylene welding.

Ans.

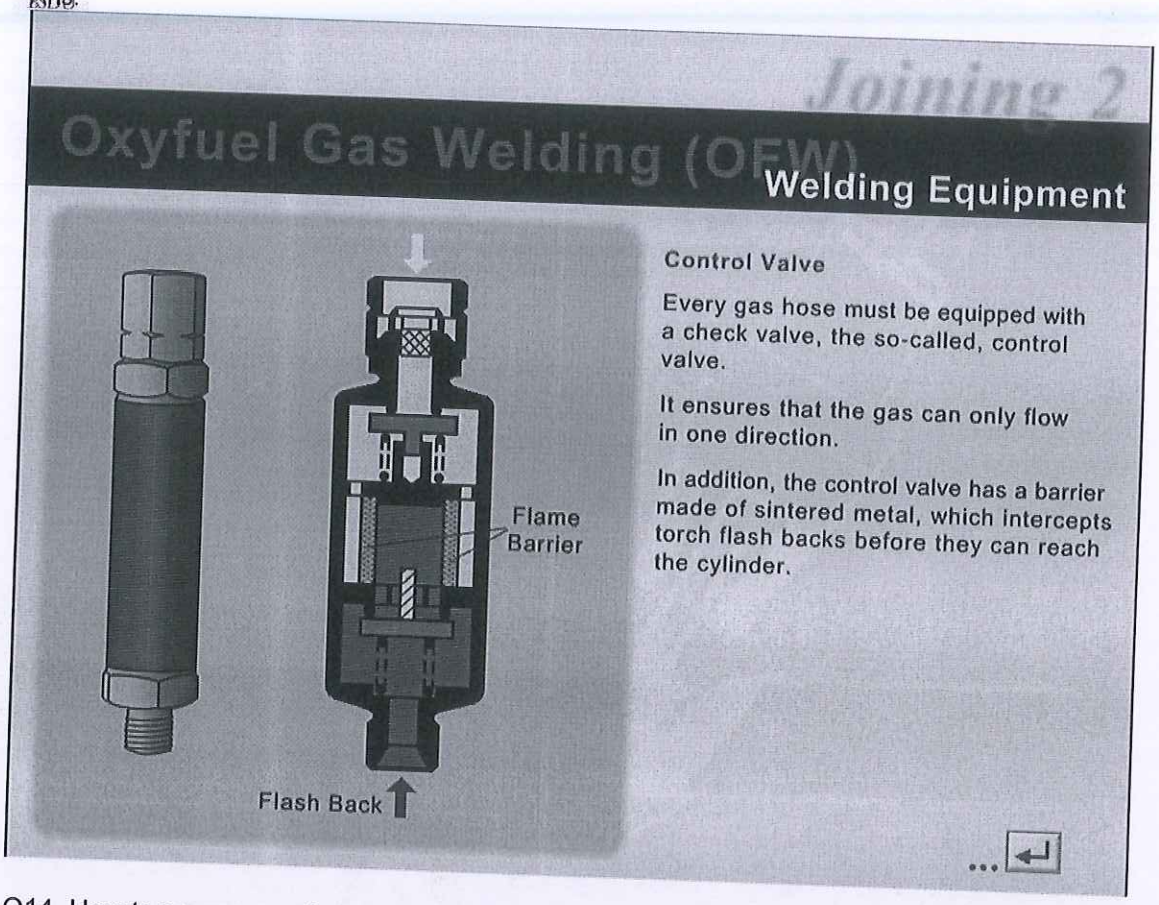


Q12. Write-down the steps to set the flame.

Ans. In order to adjust the flame, the following process steps are necessary.

1. Make sure both pressure regulators are closed after previous use.
2. Slowly open the cylinder valves about one revolution.
3. Set operating pressure on the acetylene and oxygen pressure regulators.
4. First, open torch's oxygen valve.
5. Then, open torch's acetylene valve.
6. Ignite gas mixture.

Q13. What is control valve? Write short note on control valve use.



Q14. How to prepare workpiece for brazing?

Ans. The following steps must be done before the brazing procedure can begin:

1. Select filler metal and flux.
2. Mechanically and chemically, clean joint area.
3. Apply flux to area is to be brazed.
4. Position work pieces properly and fasten together.

Section – C

04X06 = 24 Marks

Q15. What do you understand by gas hoses? Make the diagram of welding set-up.

Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

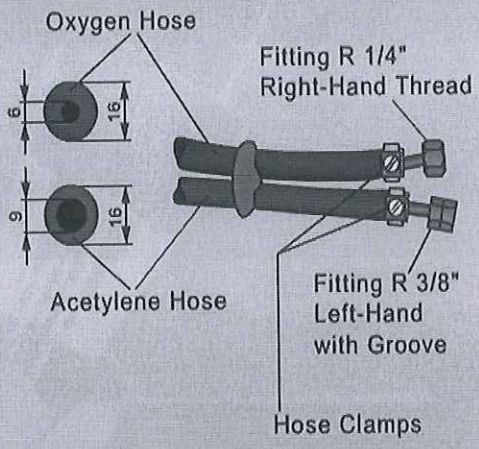
Gas Hoses

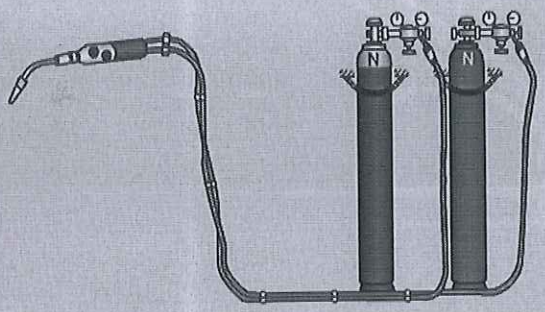
Oxygen and acetylene reach the torch via special hoses which are at least 3 meters in length.

To prevent confusing one with the other, the oxygen hose is colored blue and the acetylene hose, red.

In addition, their connections are constructed differently.

The two hoses also have a different cross-section.

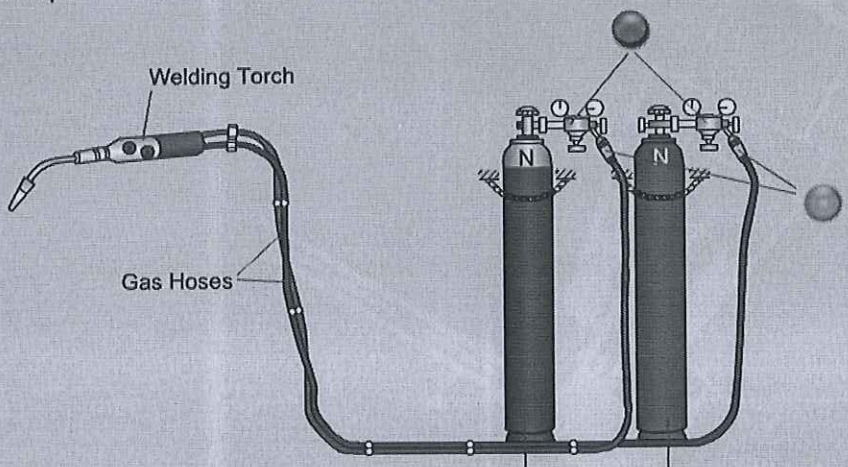




Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

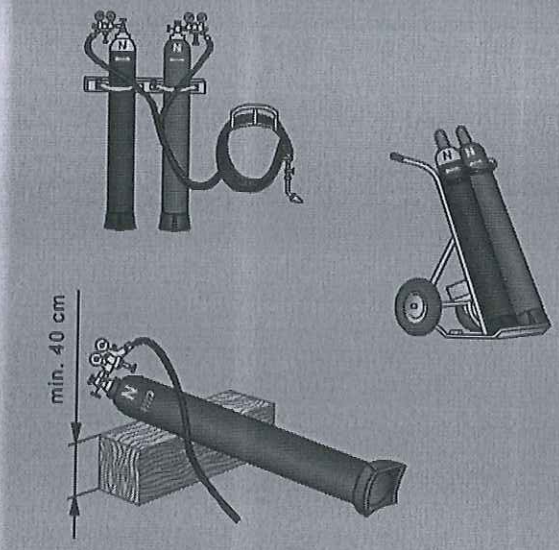
Set-Up



Q16. Write down occupational safety for oxy-fuel gas welding.

Oxyfuel Gas Welding (OFW)

Welding Gases



Occupational Safety

Because of the high pressure and the fire hazard, storing and working with gas cylinders is especially dangerous.

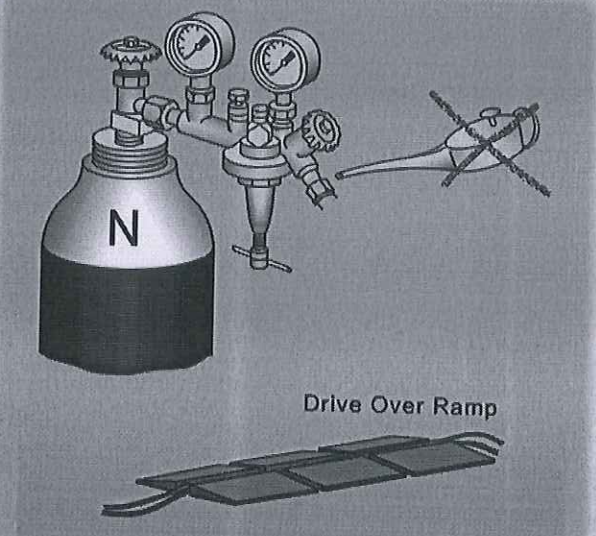
Therefore, the safety and OSHA regulations pertaining to these situations are especially strict.

- Secure gas cylinders against tipping over with wall mounting device.
- When this is not possible, always place them in a tilted position.
- Transport gas cylinders only on special cylinder trucks with protective caps screwed in place.

Joining 2

Oxyfuel Gas Welding (OFW)

Welding Gases



Occupational Safety

- Prevent valves and fittings on oxygen cylinders from contacting oil or grease (danger of explosion!).
- Inspect connections and hoses for leaks and damage before beginning to weld.
- Protect gas cylinders against heat, frost, and impacts.
- Ensure good work place ventilation.
- Protect hoses against sparks, hot work piece particles and being driven over by vehicles.

Q17. Why we use pressure regulators, explain in detail

Ans.

Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

Pressure Regulator

It is not possible to weld with the high cylinder pressures of up to 200 bars (oxygen) and 19 bars (acetylene).

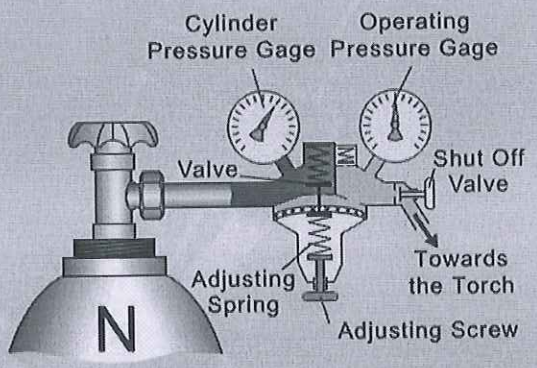
It is the function of the pressure regulator, therefore, to reduce the cylinder pressure to the so-called operating pressure and hold it constant.

Pressure regulators have two manometers (pressure gages).

The cylinder pressure gage displays the pressure inside the cylinder.

The operating pressure gage, in contrast, displays the substantially lower operating pressure.

This can be set by means of an adjusting screw.



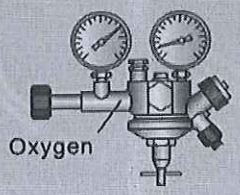
Joining 2

Oxyfuel Gas Welding (OFW) Welding Equipment

Pressure Regulator

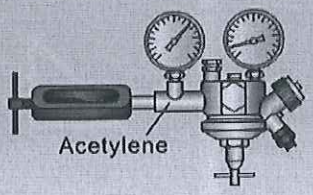
To make absolutely sure that pressure regulators for oxygen and acetylene cylinders are not accidentally reversed, they are equipped with different cylinder and hose connections.

In addition, the name of the gas is printed on each one.

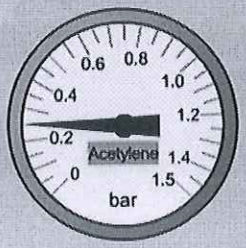


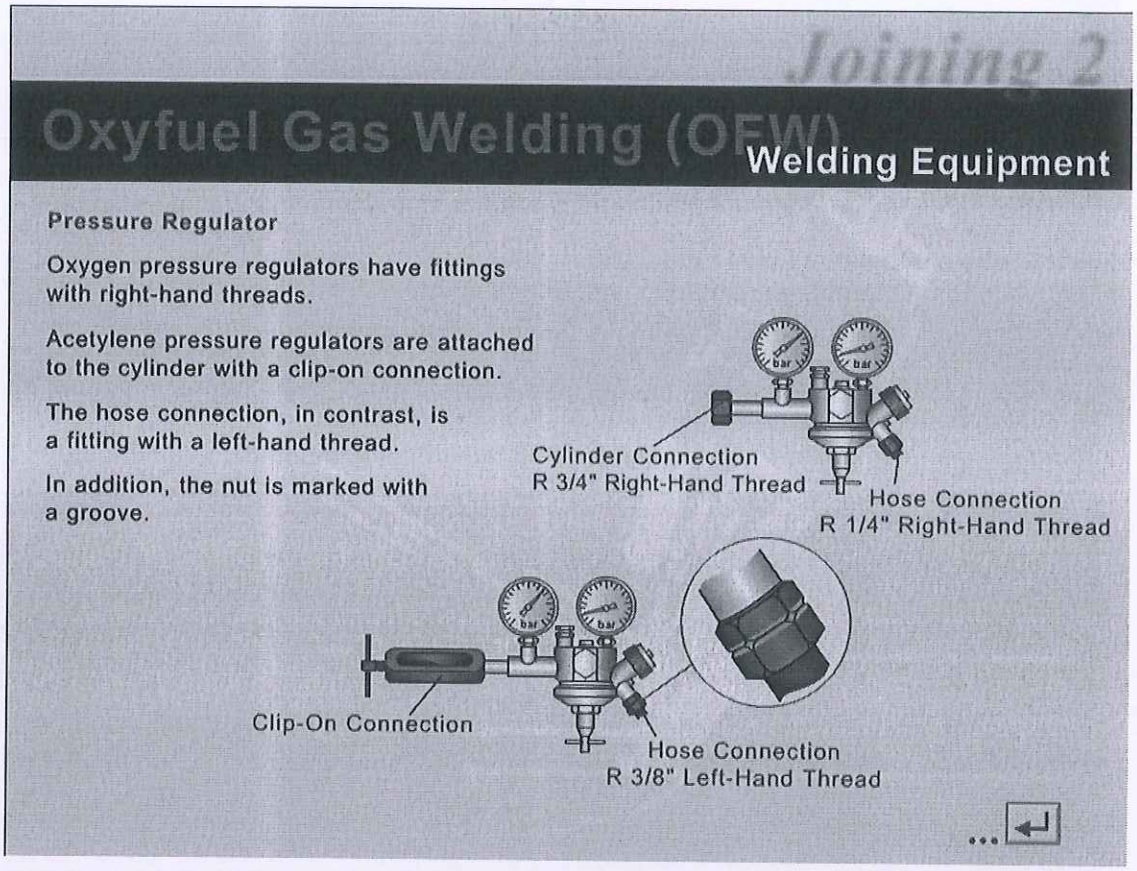
Operating Pressure:

Oxygen → approx. 2.5 bar



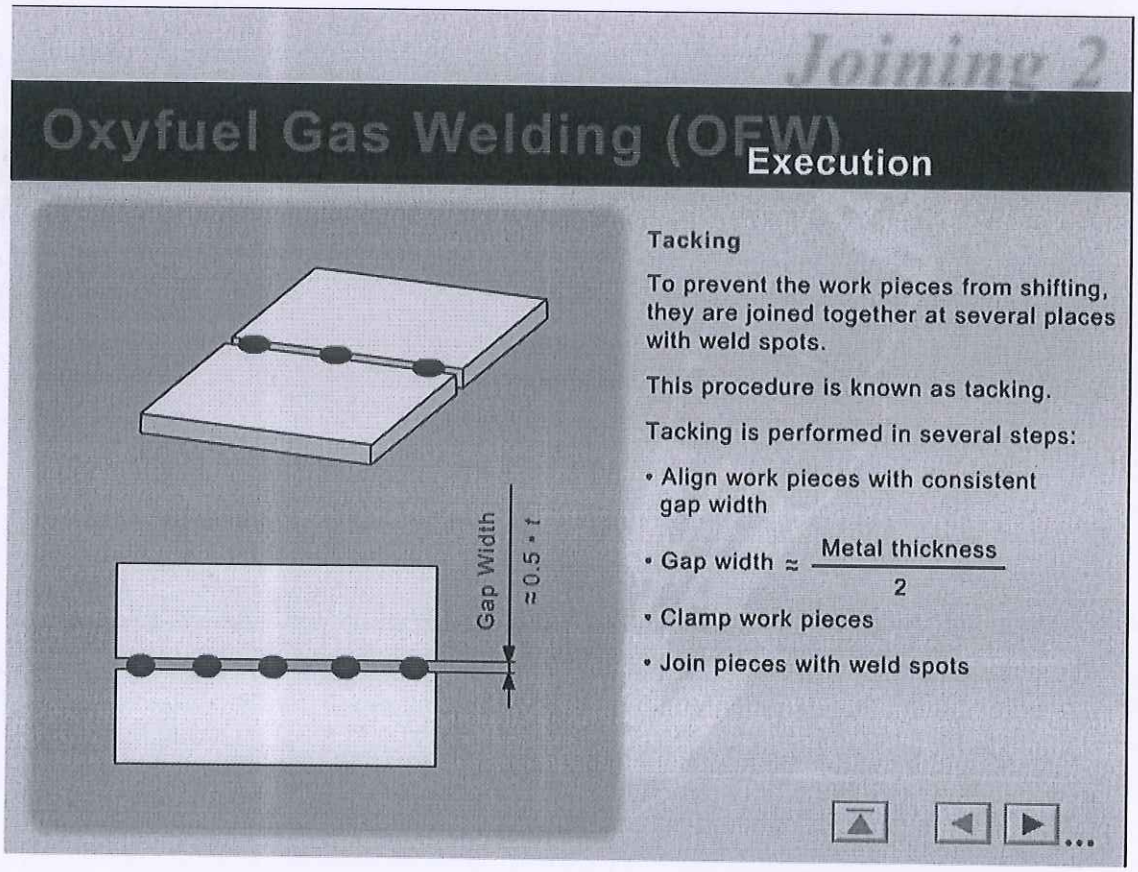
Acetylene → approx. 0.25 bar





Q18. What is tacking? Why we tack the work-piece before welding. Explain with examples.

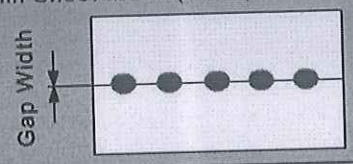
Ans.



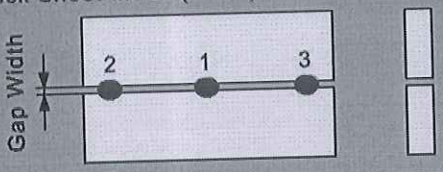
Oxyfuel Gas Welding (OFW)

Execution

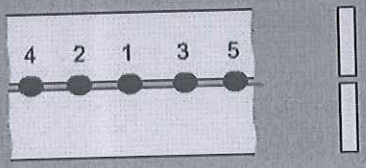
Thin Sheet Metal (Parts)



Thick Sheet Metal (Parts)



Long Sheet Metal (Parts)



Examples

The gap width, the tack spacing and the tack order are determined by, among other things, the thickness of the work piece.

Thin sheet metal, less than 1 mm thick, is tacked without a gap.

The tack spacing is small.

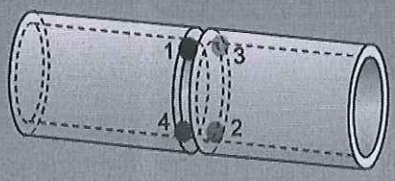
Thick pieces of sheet metal are tacked with a gap and a larger tack spacing.

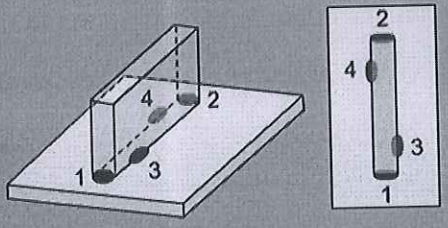
Long pieces of sheet metal are tacked on alternating sides, beginning in the middle.

Joining 2

Oxyfuel Gas Welding (OFW)

Execution





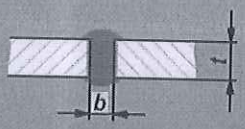
Examples

Pipes are tacked at several places on opposite sides.

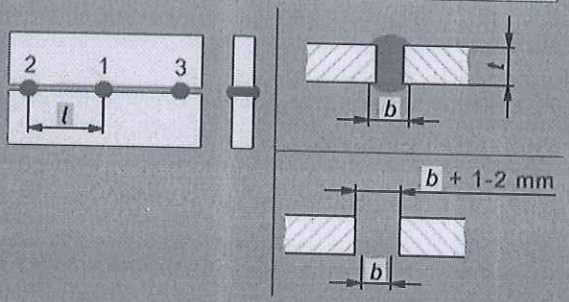
T-joints are tacked first on the ends and then on alternating sides in an offset position.

Oxyfuel Gas Welding (OFW)

Execution



Sheet Metal Thickness t (mm)	1	2	3	4
Gap Width b (mm)	0.5	2	2-3	3
Tack Spacing l (mm)	50	80	125	150-200
Welding Distance Ø (mm)	2	2	3	3



Practical Tip

The exact gap width and tack spacing are found in tables.

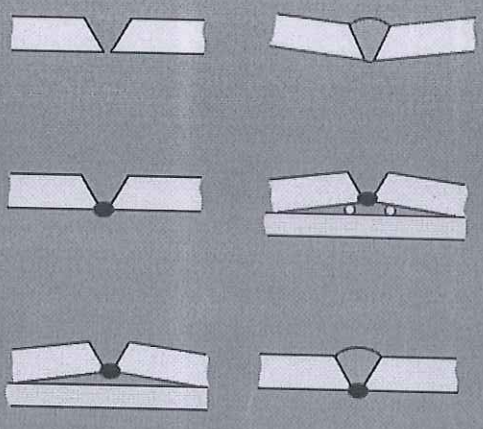
When the weld spots cool, however, they contract, pulling the work pieces closer together.

This reduces the gap width considerably.

Therefore, as a rule, the gap width must be set an extra 1-2 mm wider when aligning the work pieces.

Oxyfuel Gas Welding (OFW)

Execution



Practical Tip

Distortion can sometimes be a problem, especially when welding larger seams.

This is avoided by first tacking the work pieces at the ends.

Then, placing wires underneath the joint area, the seam is bent so as to oppose the direction of the anticipated distortion.

Then, the rest of the tack spots are welded, followed by the seam.

Vetted
Rishi Vatsa

Of Set A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester

End-Sem. Examination Set-A

Course Code: MCS1107 **Time: 2 Hours**

Course Name: Elementary drawing understanding **Max. Marks: 50**

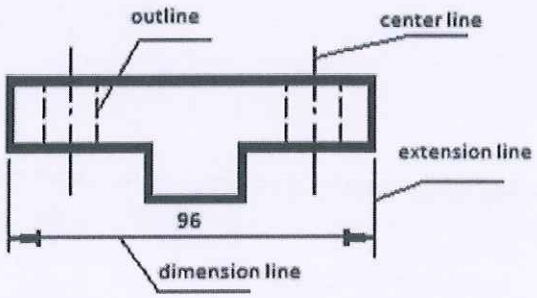
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. The wrongly represented line in the below figure is _____



a) dimension line
b) extension line
c) outline
d) center line

2. Continuous thin wavy line is use for showing _____.
   a) Dimension lines c) Short break lines
   b) Extension lines d) Long break lines

3. Dimensioning doesn't represent _____
   a) height
   b) length
   c) depth
   d) material

4. Two types of dimensions needed on a drawing are: i.) size or functional dimensions and ii) location or datum dimensions.

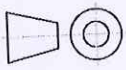
a) True
b) False

5. Which is the wrong statement regarding dimensions?
   a) Every dimension must be given, but none should be given more than once
   b) Every dimension should be written to the left side of the drawing
   c) Dimensions should be placed outside the views
   d) A center line should not be used as a dimension line

6. The straight lines which are drawn from various points on the contour of an object to meet a plane are called as _____
   a) connecting lines
   b) projectors (line of sight)
   c) perpendicular lines
   d) hidden lines.

7. When the projectors are parallel to each other and also perpendicular to the plane, the projection is called _____
   a) Perspective projection
   b) Oblique projection
   c) Isometric projection
   d) Orthographic projection

8. The object we see in our surrounding usually without drawing came under which projection?
   a) Perspective projection
   b) Oblique projection
   c) Isometric projection
   d) Orthographic projection

9.  This symbol shows_____ angle projection.
   a) 1st angle
   b) 2nd angle
   c) 4th angle
   d) 3rd angle

10. In orthographic projection, each projection view represents how many dimensions of an object?
    a) 1
    b) 2
    c) 3
    d) 0

Section – B

Section – B

04X04 = 16 Marks

Q11. What do you mean by geometric tolerances explain with example?

Q12. What is the difference between First and Third angle projection?

Q13. What is isometric view in engineering drawing?

Q14. Give all necessary dimensions to the drawing.

Section – C

04X06 = 24 Marks

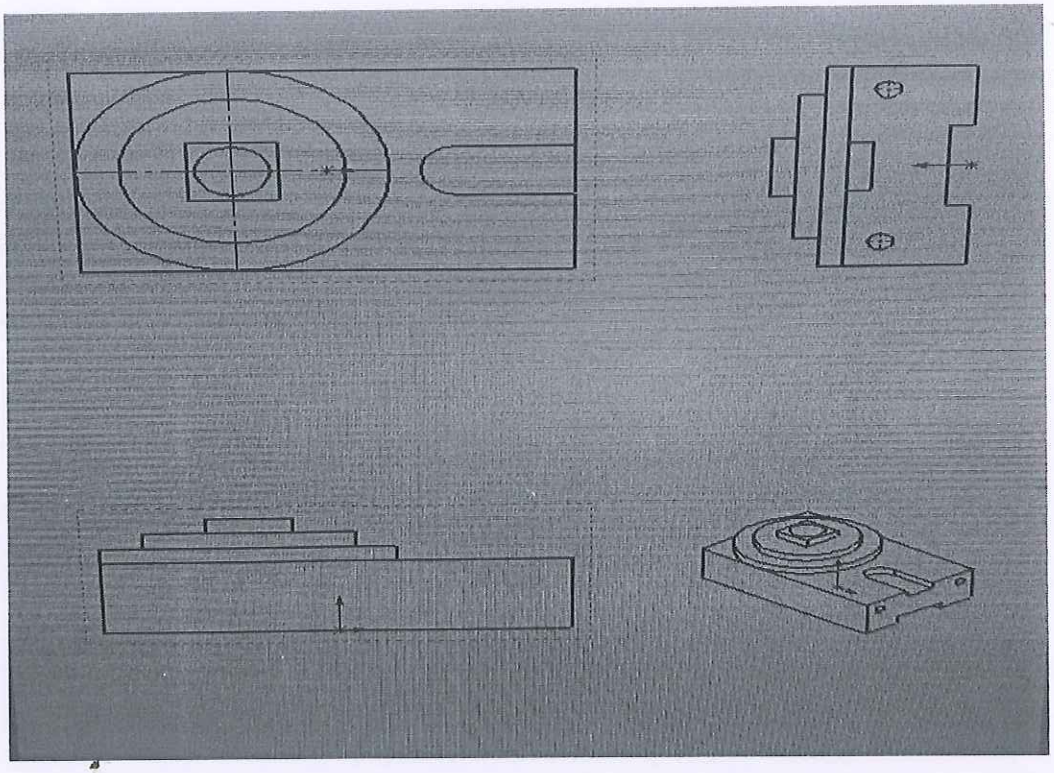
Q15. What is projection and its variables also explain parallel & perspective projection?

Q16. Explain first and third angle projection.

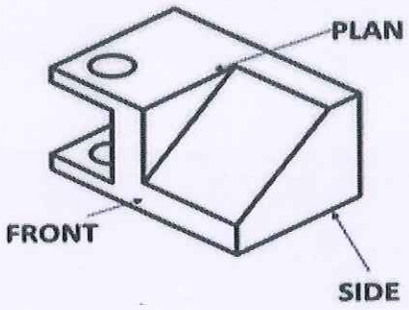
Q17. Explain types of line and also explain their application.

Q18. Draw the all multi-view of this drawing in 3st angle projection.

Q14.

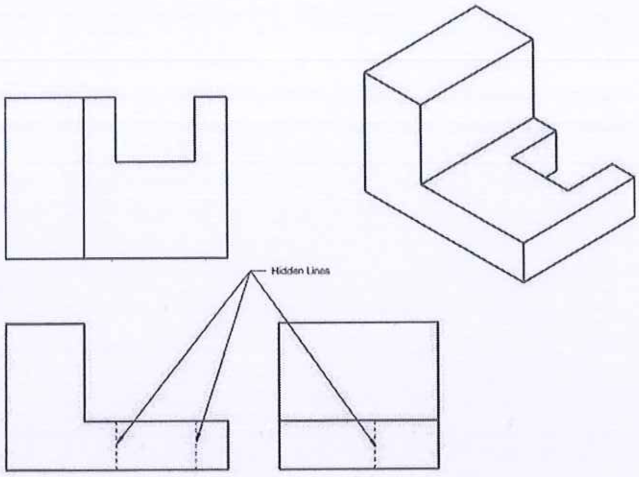


Q18.

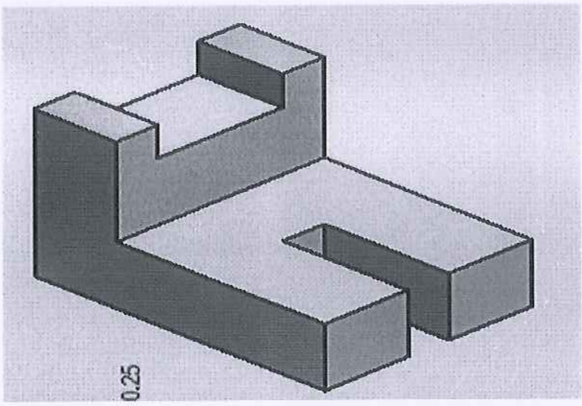


→ Elementary Drawing Set - B, I-Sem, End-Sem,

Q14.



Q18.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1107 **Time: 2 Hours**

Course Name: Elementary drawing understanding **Max. Marks: 50**

Instruction:

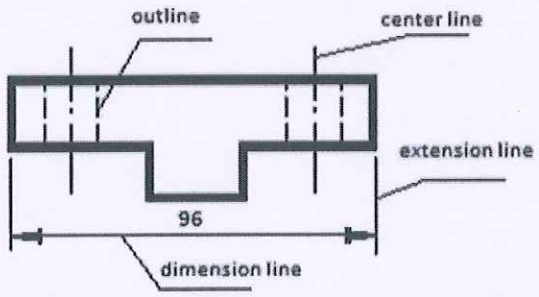
1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Answer key

Section – A

10X01 = 10 Marks

1. The wrongly represented line in the below figure is _____



a) dimension line
b) extension line
c) outline
d) center line

2. Continuous thin wavy line is use for showing _____.
   a) Dimension lines **c) Short break lines**
   b) Extension lines d) Long break lines

3. Dimensioning doesn't represent _____
   a) height
   b) length
   c) depth
   d) material

4. Two types of dimensions needed on a drawing are: i) size or functional dimensions and ii) location or datum dimensions.

a) True

b) False

5. Which is the wrong statement regarding dimensions?

a) Every dimension must be given, but none should be given more than once

b) Every dimension should be written to the left side of the drawing

c) Dimensions should be placed outside the views

d) A center line should not be used as a dimension line

6. The straight lines which are drawn from various points on the contour of an object to meet a plane are called as _____

a) connecting lines

b) projectors (line of sight)

c) perpendicular lines

d) hidden lines.

7. When the projectors are parallel to each other and also perpendicular to the plane, the projection is called _____

a) Perspective projection

b) Oblique projection

c) Isometric projection

d) **Orthographic projection**

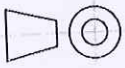
8. The object we see in our surrounding usually without drawing came under which projection?

a) Perspective projection

b) Oblique projection

c) Isometric projection

d) Orthographic projection

9.  This symbol shows_____ angle projection.

a) 1st angle

b) 2nd angle

c) 4th angle

d) 3rd angle

10. In orthographic projection, each projection view represents how many dimensions of an object?

a) 1

b) **2**

c) 3

d) 0

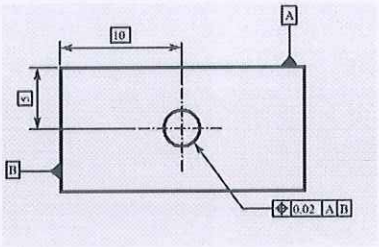
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – B

04X04 = 16 Marks

Q11. What do you mean by geometric tolerances explain with example?

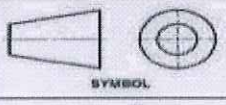
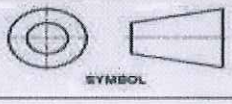
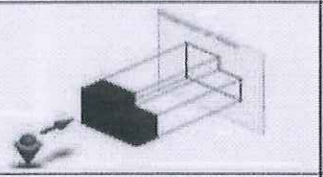
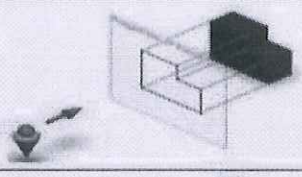
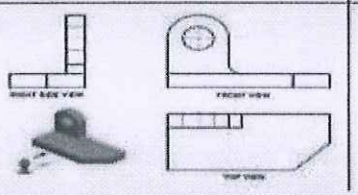
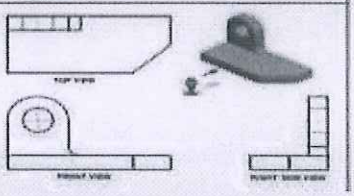
Ans: - Geometric Dimensioning and Tolerance (GD&T) is a system for defining and communicating engineering tolerances. It uses a symbolic language on engineering drawings and computer-generated three-dimensional solid models that explicitly describe nominal geometry and its allowable variation. It tells the manufacturing staff and machines what degree of accuracy and precision is needed on each controlled feature of the part. GD&T is used to define the nominal (theoretically perfect) geometry of parts and assemblies, to define the allowable variation in form and possible size of individual features, and to define the allowable variation between features.



Q12. What is the difference between First and Third angle projection?

Ans: -

First angle projection & Third angle projection

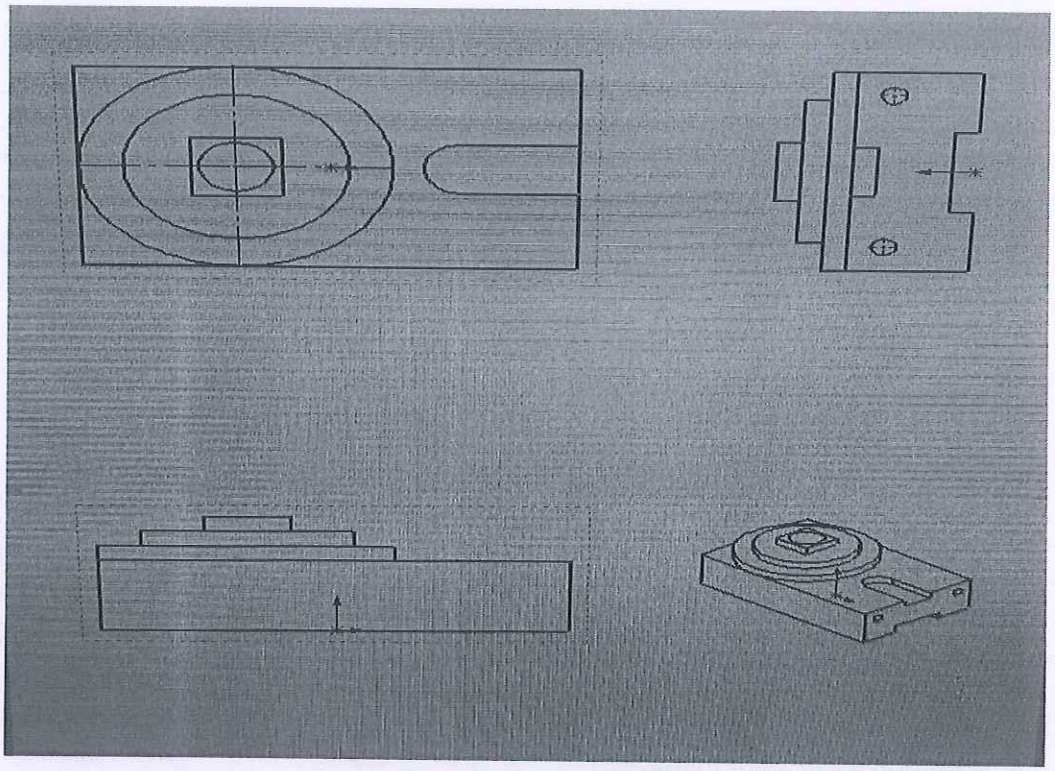
First Angle Projection	Third Angle Projection
The object is imagined to be in first quadrant.	The object is imagined to be in third quadrant.
The object is lies between the observer and plane of projection.	The plane of projection lies between the observer and object.
The plane of projection is assumed to be non transparent.	The plane of projection is assumed to be transparent.
When view are drawn in their relative position Top view comes below Front view, Right side view drawn to the left side of elevation.	When view are drawn in their relative position Top view comes above Front view, Right side view drawn to the right side of elevation.
	
	
	

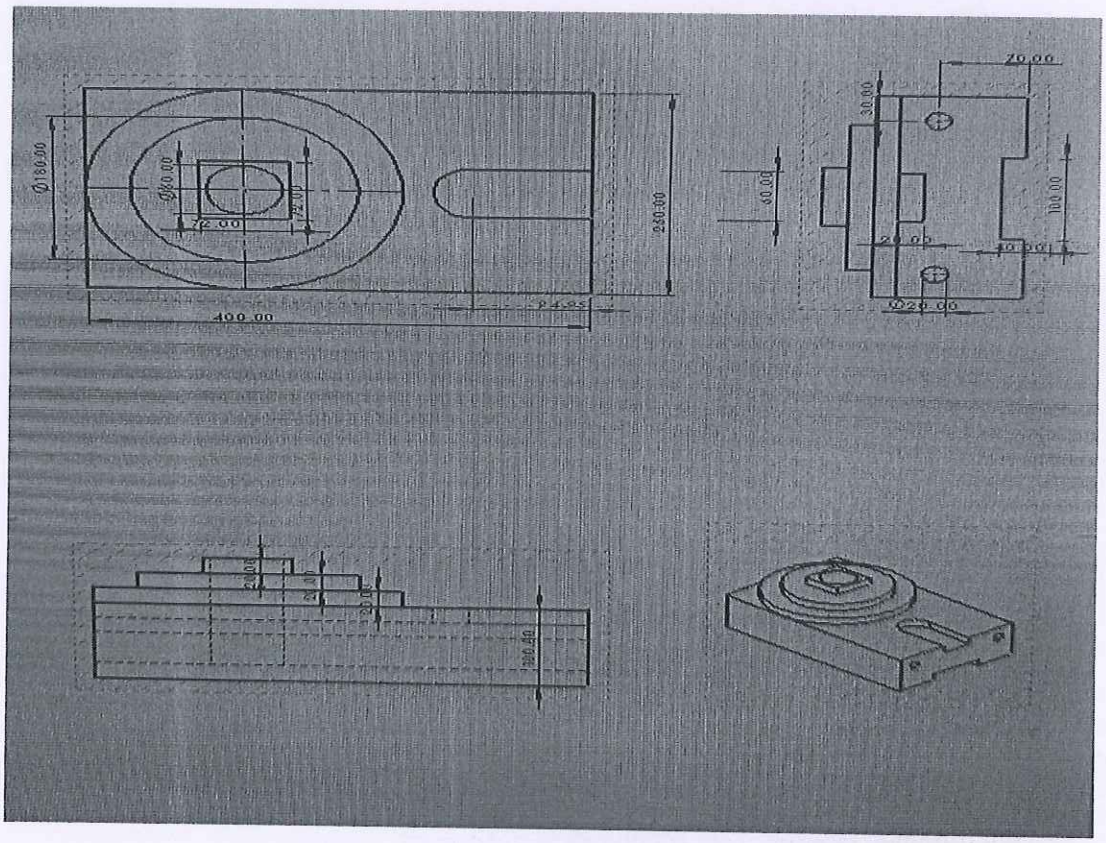
Q13. What is isometric view in engineering drawing?

Ans: Isometric projection is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings. It is an axonometric projection in which the three coordinate axes appear equally foreshortened and the angle between any two of them is 120 degrees

Q14. Give all necessary dimensions to the drawing.

Ans: -





Section – C

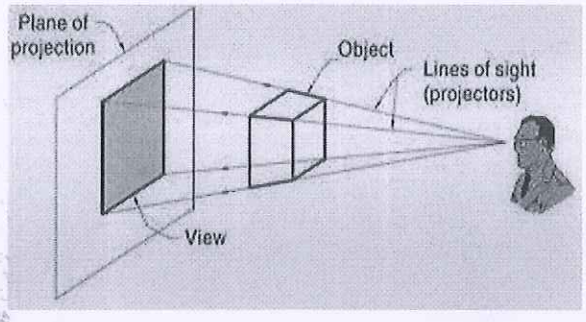
04X06 = 24 Marks

Q15. What is projection and its variables also explain parallel & perspective projection?

Ans: - In engineering, 3- dimensional objects and structures are represented graphically on a 2-dimensional media. The act of obtaining the image of an object is termed "projection".

There are two variables.

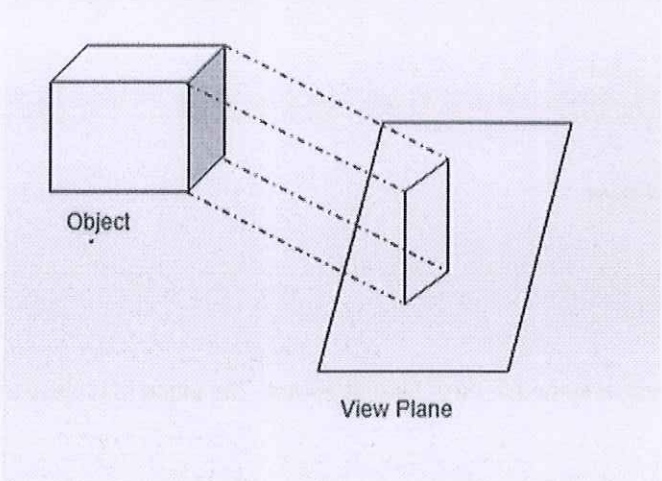
a) Line of sight
b) Plane of projection.



Parallel Projection :

Parallel projections are used by architects and engineers for creating working drawing of the object, for complete representations require two or more views of an object using different planes.

Parallel Projection use to display picture in its true shape and size. When projectors are perpendicular to view plane then is called orthographic projection. The parallel projection is formed by extending parallel lines from each vertex on the object until they intersect the plane of the screen. The point of intersection is the projection of vertex.



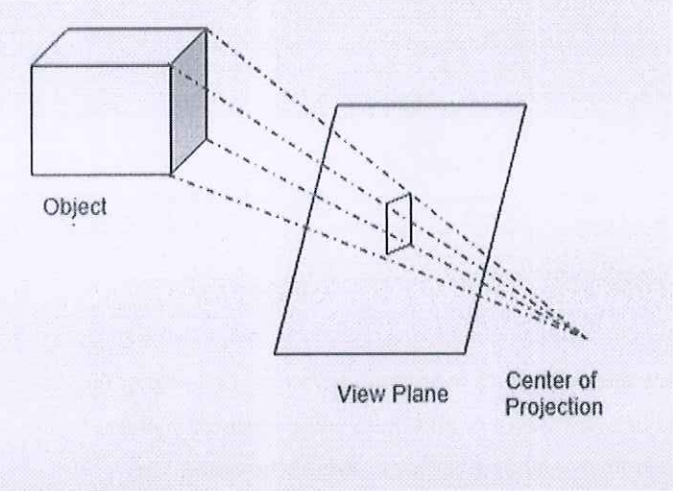
2. Perspective Projection :

Perspective projections are used by artist for drawing three-dimensional scenes.

In Perspective projection lines of projection do not remain parallel. The lines converge at a single point called a center of projection. The projected image on the screen is obtained by points of intersection of converging lines with the plane of the screen.

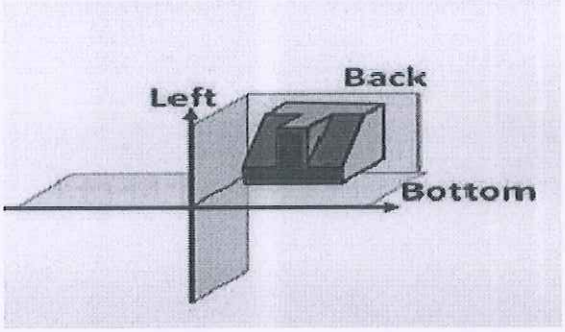
The image on the screen is seen as of viewer's eye were located at the center of projection, lines of projection would correspond to path travel by light beam originating from object.

Two main characteristics of perspective are vanishing points and perspective foreshortening. Due to foreshortening object and lengths appear smaller from the center of projection. More we increase the distance from the center of projection, smaller will be the object appear.

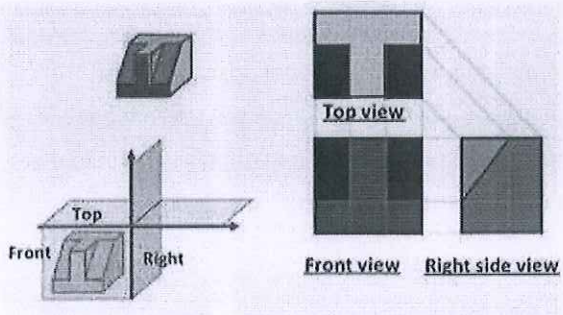


Q16. Explain first and third angle projection.

Ans: - First angle projection: - in this the object assumed to be in first quadrant. The object is assumed to be placed b/w observer or plane of projection.



Third angle projection: - In this the object assumed to be in third quadrant. The plane of projection is placed b/w observer and object.



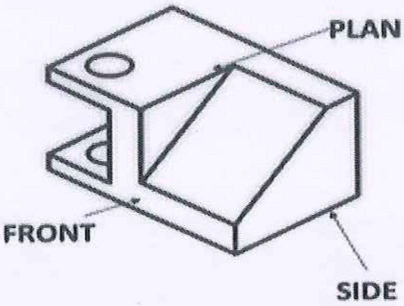
Q17. Explain types of line and also explain their application.

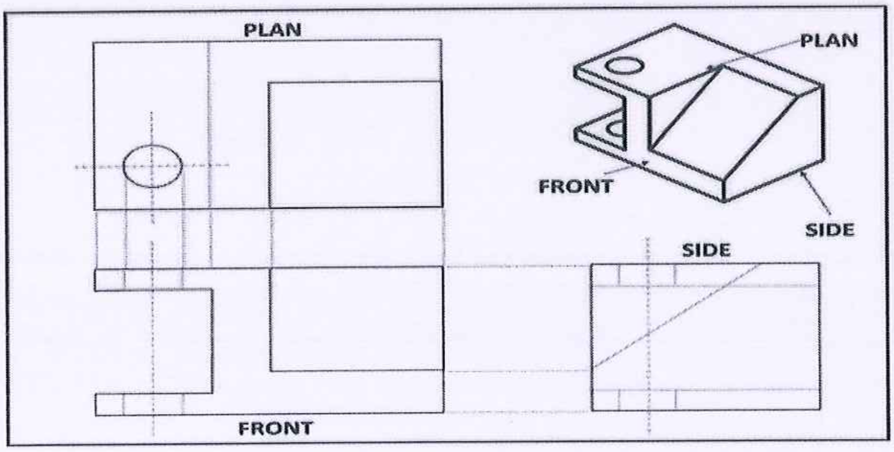
Ans: -

Illustration	Application
Thick	Outlines, visible edges, surface boundaries of objects, margin lines
Continuous thin	Dimension lines, extension lines, section lines leader or pointer lines, construction lines, boarder lines
Continuous thin wavy	Short break lines or irregular boundary lines – drawn freehand
Continuous thin with zig-zag	Long break lines
Short dashes, gap 1, length 3 mm	Invisible or interior surfaces
Short dashes	Center lines, locus lines Alternate long and short dashes in a proportion of 6:1,
Long chain thick at end and thin elsewhere	Cutting plane lines

Q18. Draw the all multi-view of this drawing in 3rd angle projection.

Ans: -





QP Set B

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

End-Sem. Examination

Course Code: MCS1107 Set B **Time: 2 Hours**

Course Name: Elementary drawing understanding **Max. Marks: 50**

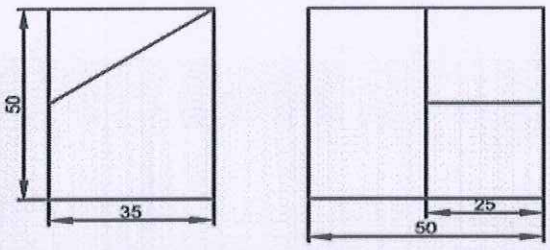
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which type of dimensioning is shown in the figure?



a) Aligned dimension
b) Unidirectional dimension
c) Combined dimension
d) Chain Dimension

2. Baseline dimensions are referenced from a common geometric feature known as a _____.

a) Edge
b) Datum
c) point of reference
d) corner

3. In unidirectional system of dimensioning, the dimensions may be read from
   a) Bottom or right hand edges
   b) Bottom or left hand edges

c) Only from left hand

d) Only from bottom

4. Parallel projection represents three dimensional objects in

a) One dimension

b) Two dimension

c) Three dimension

d) All of above

5. Hatching lines are drawn at ___ degree to reference line

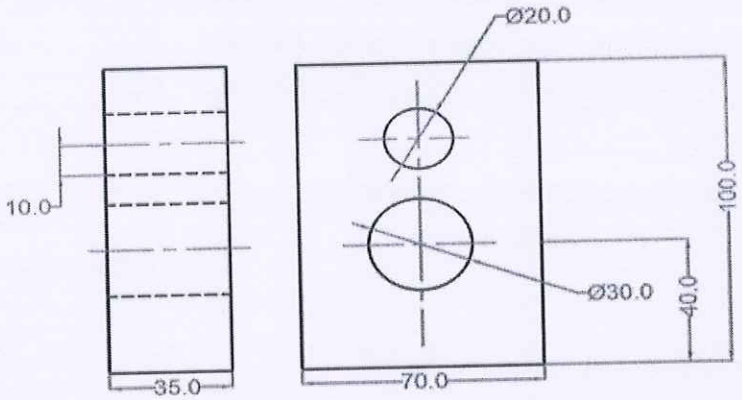
a) 30

b) 60

c) 45

d) 90

6. From the following figure, which is the repetitive dimension?



a) 30

b) 70

c) 10

d) 20

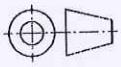
7. In parallel projection the object is placed at _____.

a) Infinity distance

b) 400km

c) Finite distance

d) Not clearly says

8.  This symbol shows_____angle projection.

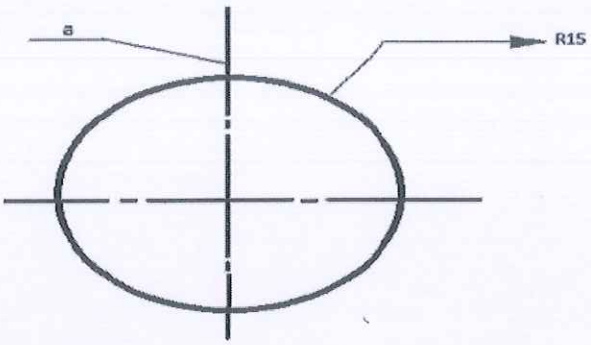
a) 1st angle

b) 2nd angle

c) 4th angle

d) 3rd angle

9. Identify the 'a' in the given picture



a) dimension line
b) hidden line
c) center line
d) outline

10. The dotted lines represent.
a) Hidden edges
b) Center line
c) Projection lines
d) Hatching lines

Section – B

04X04 = 16 Marks

Q11. What kind of information title box carry?

Q12. What are the difference between parallel and perspective projection?

Q13. What are the rules of dimensioning?

Q14. Give all necessary dimensions to the drawing.

Section – C

04X06 = 24 Marks

Q15. What are the types of drawing explaining each?

Q16. Explain multi-view projection in first and third angle projection.

Q17. What are they six principle view in orthography projection and why we use only three principle view?

Q18. Draw the all multi-view of this drawing in 3rd angle projection.

Vetted

As Set B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Metal Construction Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I-Semester,

Answer sheet End-Sem. Examination

Course Code: MCS1107 **Time: 2 Hours**

Course Name: Elementary drawing understanding **Max. Marks: 50**

Instruction:

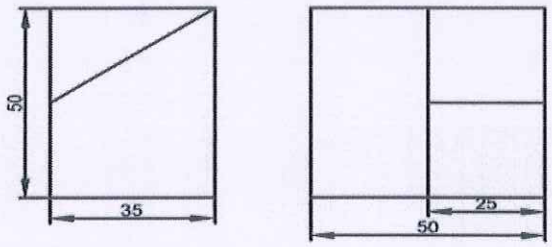
Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contain 10 Questions. Each question carries 1 Marks.
4. Section B contain 04 Questions. Each question carries 4 Marks.
5. Section C contain 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which type of dimensioning is shown in the figure?



a) Aligned dimension

b) Unidirectional dimension

c) Combined dimension

d) Chain Dimension

2. Baseline dimensions are referenced from a common geometric feature known as a _____.

a) Edge c) point of reference

b) **Datum** d) corner

3. In unidirectional system of dimensioning, the dimensions may be read from

a) Bottom or right hand edges

b) Bottom or left hand edges

c) Only from left hand

d) Only from bottom

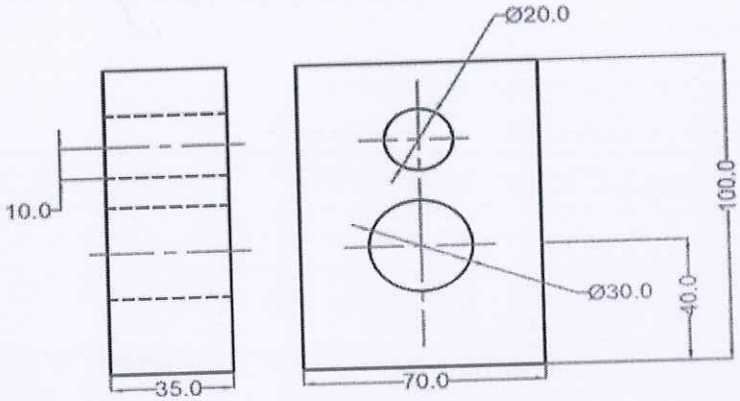
4. Parallel projection represents three dimensional objects in

a) One dimension
c) Three dimension
b) **Two dimension**
d) All of above

5. Hatching lines are drawn at ___ degree to reference line

a) 30
c) 45
b) 60
d) 90

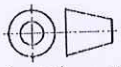
6. From the following figure, which is the repetitive dimension?



a) 30
b) 70
c) 10
d) 20

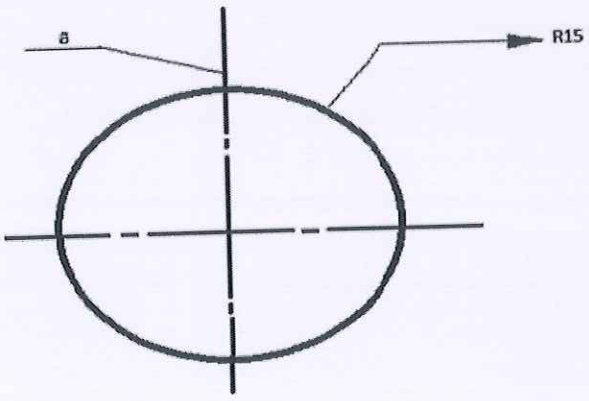
7. In parallel projection the object is placed at _____.

a) **Infinity distance**
c) Finite distance
b) 400km
d) Not clearly says

8.  This symbol shows_____angle projection.

a) **1st angle**
c) 4th angle
b) 2nd angle
d) 3rd angle

9. Identify the 'a' in the given picture



a) dimension line
b) hidden line

c) center line

d) outline

10. The dotted lines represent.

a) **Hidden edges** c) Projection lines

b) Center line d) Hatching lines

Section – B

04X04 = 16 Marks

Q11. What kind of information title box carry?

Ans: - information carried by title box is

- Drawing title (hence the name "title block")
- Drawing number
- Part number(s)
- Name of the design activity (corporation, government agency, etc.)
- Identifying code of the design activity (such as a CAGE code)
- Address of the design activity (such as city, state/province, country)
- Measurement units of the drawing (for example, inches, millimeters)
- Default tolerances for dimension callouts where no tolerance is specified
- Boilerplate callouts of general specs
- Intellectual property rights warning

Q12. What are the difference between parallel and perspective projection?

Ans: -

Parallel projection: Distance from the observer to the object is infinite projection

Lines are parallel – object is positioned at infinity.

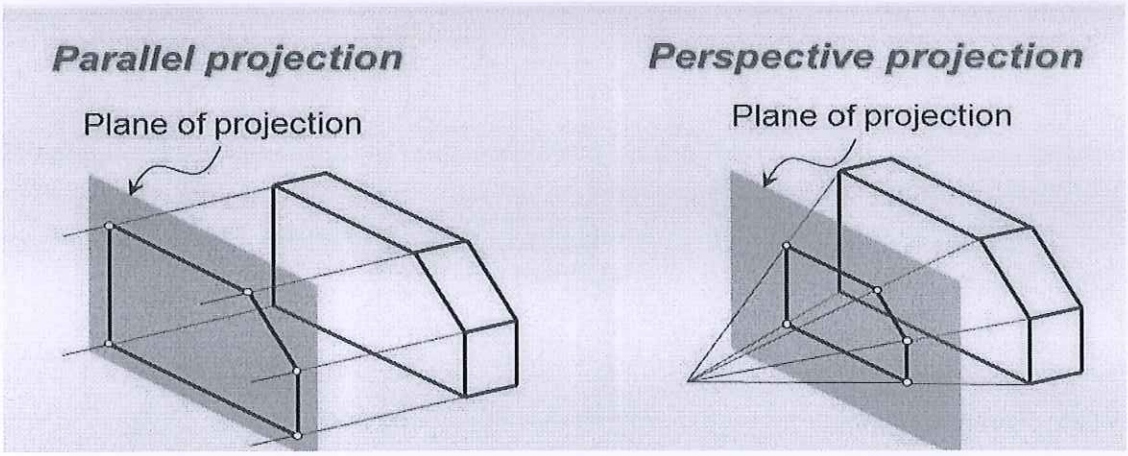
Less realistic but easier to draw.

Perspective projection: Distance from the observer to the object is finite and

The object is viewed from a single point – projectors are not parallel.

Perspective projection mimic what the human eyes see, however they are

Difficult to draw.



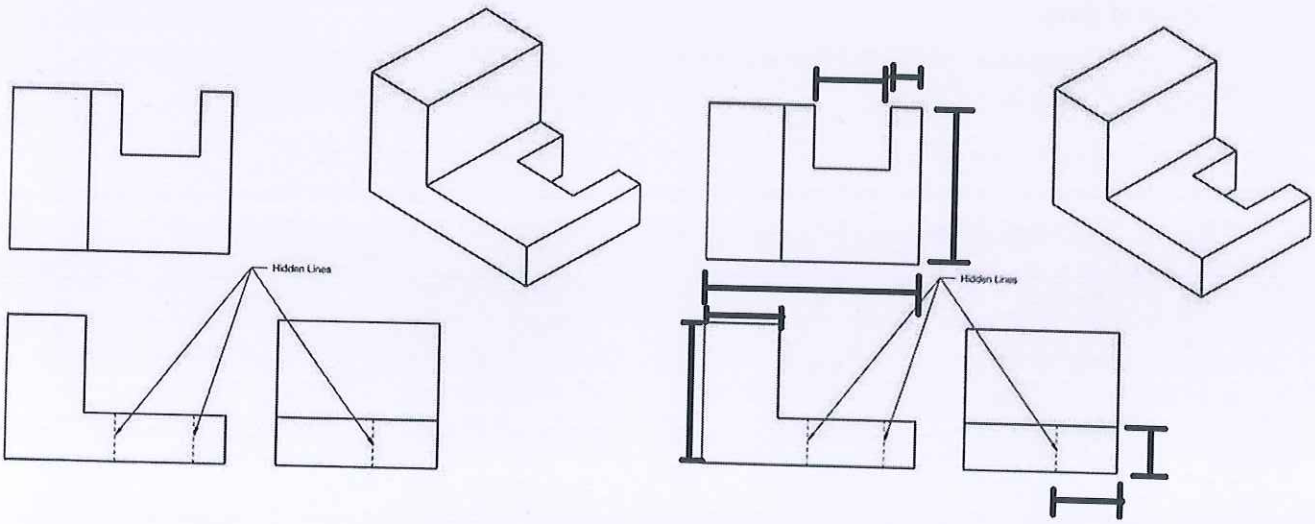
Q13. What are the rules of dimensioning?

Ans: Rules for Dimensioning a Technical Drawing

1. Each dimension should be given clearly, so that it can be interpreted in only one-way.
2. Dimensions should not be duplicated, or the same information given in twodifferent ways, and no dimensions should be given except those needed to produce or inspect the part.
3. Dimensions should be given between views whenever possible. However, it issometimes necessary to place a dimension above or below a view.
4. Dimensions should be given so that it will not be necessary for the machinist tocalculate, scale, or estimate any dimension.
5. Dimensions should be attached to the view where the shape is best shown. Thisis most frequently the front view.
6. Dimensions should be placed in the views where features dimensioned areshown true shape. This sometimes means dimensioning an auxiliary view.
7. Avoid dimensioning to hidden lines wherever possible.
8. Dimensions should not be placed upon a view unless clearness is promoted, andlong extension lines are avoided.
9. Dimensions applying to two adjacent views should be placed between views, unless clearness will be promoted by placing them outside the view.
10. The longer dimensions should be placed outside all intermediate or shorterdimensions, so that dimension lines will not cross extension lines.
11. In machine drawings, omit all inch marks, except when necessary for clearness; for example, 1" VALVE.
12. A dimension should be attached to only one view: extension lines should not connect two views.
13. Detail dimensions should "line up" in chain fashion.
14. Avoid a complete chain of detail dimensions; better to omit one. Otherwise, addREF (reference) to one detail dimension, or to the overall dimension.
15. Dimension lines should be spaced uniformly throughout the drawing. Theyshould be spaced at least 3/8" from the object, and 1/4" apart.
16. No line of the drawing should be used as a dimension line or coincide with dimension line.
17. Dimension line should never cross other dimension lines

Q14. Give all necessary dimensions to the drawing.

Ans: -



Section – C

04X06 = 24 Marks

Q15. What are the types of drawing explaining each?

Ans: - types of drawing:

a) Component drawing: - component drawing contains all necessary information to produce the part
   - Graphical representation of the component shape.
   - Full dimensioning
   - Permissible deviations from dimension, shape and position
   - Material or blank
   - Surface texture

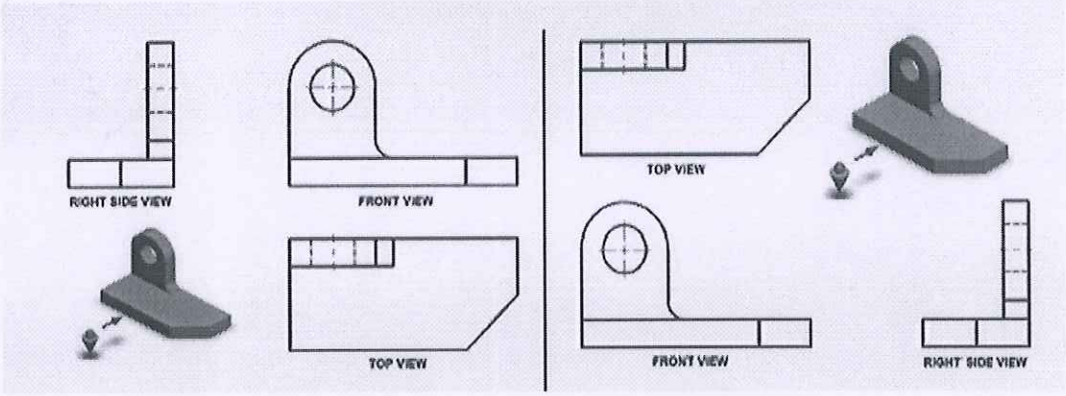
b) General drawing: - indicates the arrangements of the individual parts in the product.
   - Graphic representation of the parts in products.
   - Main and connection dimension of the product
   - Information about individual parts (for example, input quantity and unit, designation, type, size, material/raw part, weight)
   - Part list and item numbers required.

c) Hand sketches: - indicates the arrangement of the individual part in product
   An exploded view drawing is a type of drawing that shows the intended assembly of mechanical or other.

d) Exploded drawings: - indicates the arrangement of the individual parts in the product.

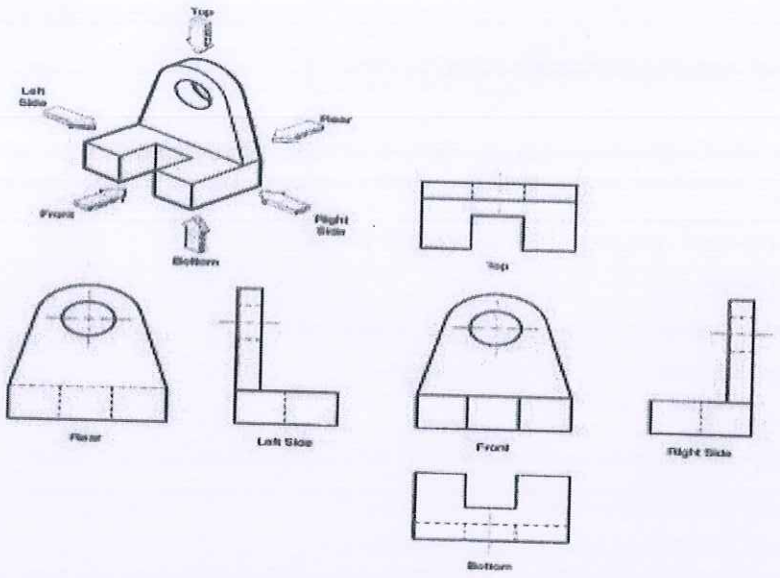
Q16. Explain multi-view projection in first and third angle projection.

Ans: -

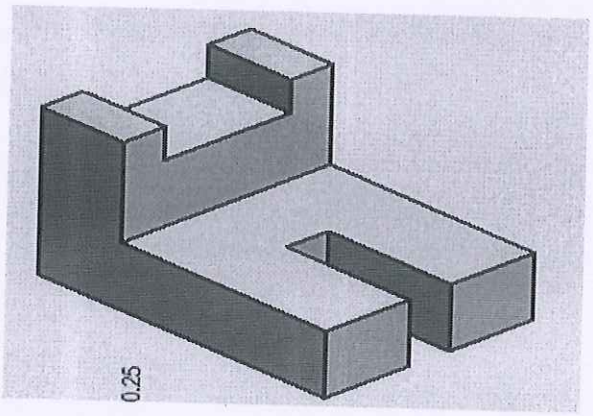


Q17. What are they six principle view in orthography projection and why we use only three principle view?

Ans: - In orthographic projection there are 6 principle views of an object, front, top, L side, R side, rear, and back views. The three most commonly views drawn on a technical drawing are the front, back, and side views most other views are not needed.



Q18. Draw the all multi-view of this drawing in 3rd angle projection.



Ans: -