



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Metal Construction Skills
Session: 2019-20 (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 contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 4 Questions. Each question carries 4 Marks.
5. Section C contains 4 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. 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

Q2. Which tool is not a marking or scribing tool?

- | | |
|----------------|---------------------|
| (A) Try square | (C) Punch |
| (B) Divider | (D) Vernier Caliper |

Q3. What is sawing with large tooth spacing?

- | | |
|---------------|---------------------|
| a) Aluminum | (b) Stainless steel |
| c) Mild steel | (d) Cast iron |

Q4. While using hacksaw which stroke is a cutting stroke?

- | | |
|--------------|--------------|
| (A) upward | (C) forward |
| (B) downward | (D) backward |

Q5. Which material do you file with a single cut file?

- | | |
|----------------|---------------------|
| (A) Mild steel | (C) Stainless steel |
| (B) Tool steel | (D) Tin |

Q6. To avoid sticking of chips in file which lubricant we use

- | | |
|------------|-------------|
| (A) water | (C) chalk |
| (B) grease | (D) coolant |

Q7. Which part does not belong to a file?

- | | |
|-----------|----------|
| (A) Tang | (C) Bow |
| (B) Blade | (D) Heel |

Q8. Which instrument used for punching?

- | | |
|-------------------|----------------------|
| (A) scribe | (C) Vernier calliper |
| (B) marking gauge | (D) centre punch |

Handwritten signature





Set - A
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

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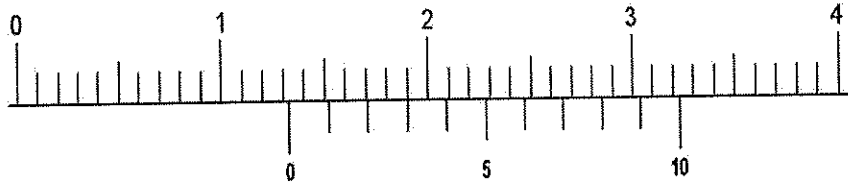
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Q8. Which instrument used for punching?

- (A) scriber
(B) marking gauge
(C) Vernier calliper
(D) centre punch

Q9. Which measurement can you read?

Tenth Vernier



- (A) 19.0mm
(B) 13.3mm
(C) 133.0mm
(D) 3.0mm

Q10. 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

Section – B

04×04 = 16 Marks

Q11. 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

Q12. Why do you scribe Aluminium with a Pencil or a felt tip pen?

Ans. When marking with a "hard" steel needle, fine cracks may appear in the soft material.

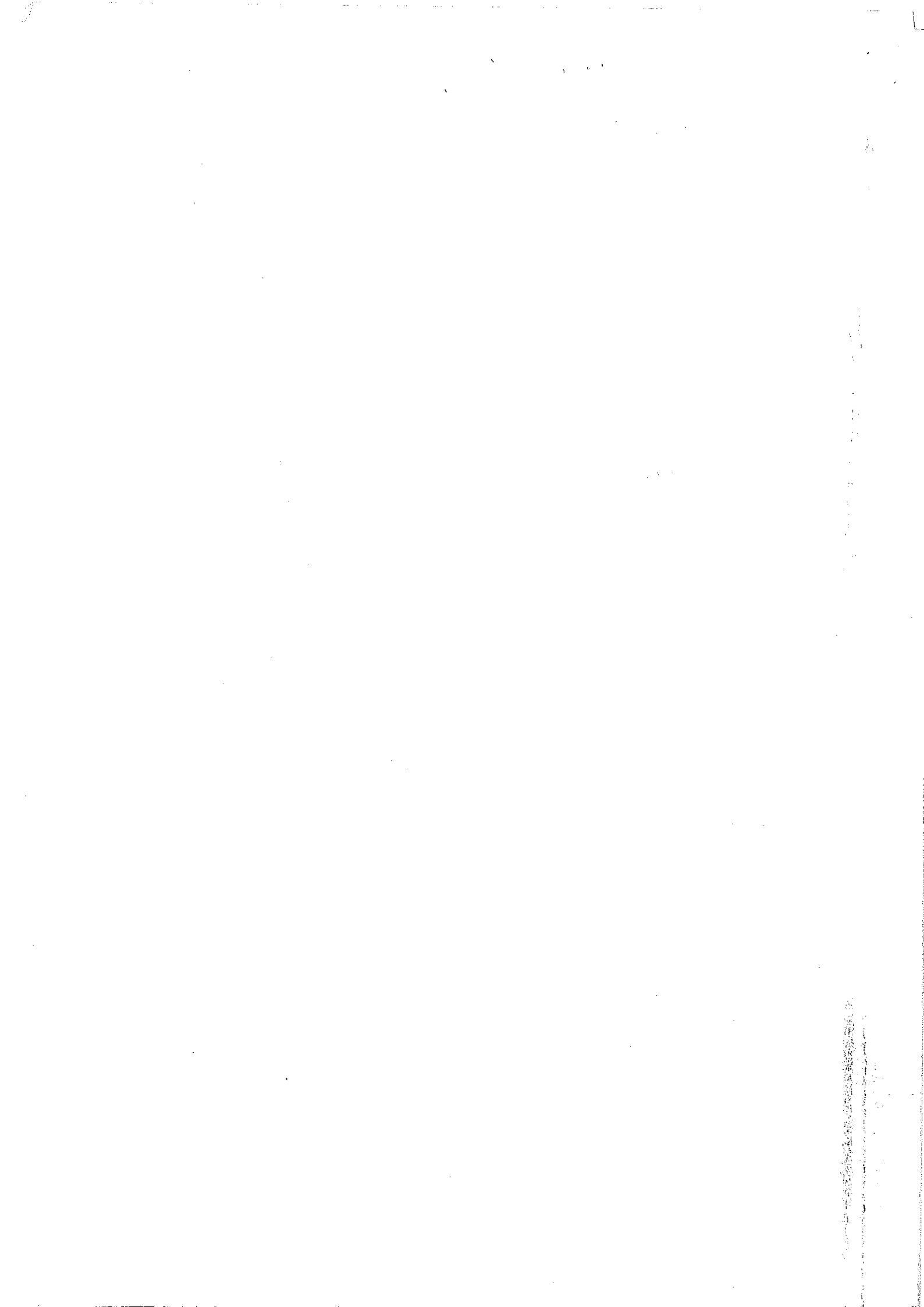
The material can break during further processing.

Q13. Why do you make a file notch?

Ans. Notching avoid the saw slipping away to the side. Notching makes it easier to positioning the saw blade.

Q14. Write safety precautions while using sawing.

Ans. Wearing safety glasses (when using machines)





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Short and safe clamping of workpieces

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 file 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.

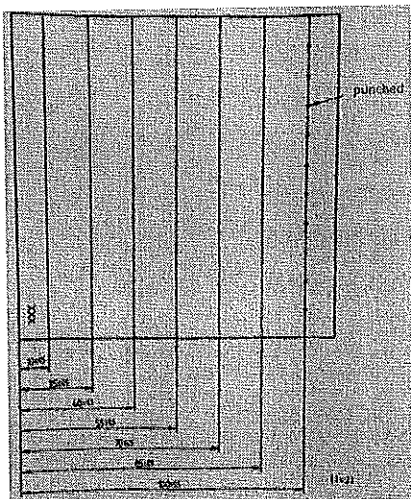
Q16 .Write the short notes on following:

- 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 work 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.

Q17. Write work plan for the following drawing



Ans. Work plan

- Material checking
- Deburring
- Sizing (measurement by measuring tool)





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Filing (file)

- Clamping
- Scribing (scriber)- scribing all lines with all dimensions
- Punching (centre punch)- on base plate
- Checking

Q18. 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.





Set - A
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

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Course Code: MCS1102
Course Name: Measuring
Instruction:

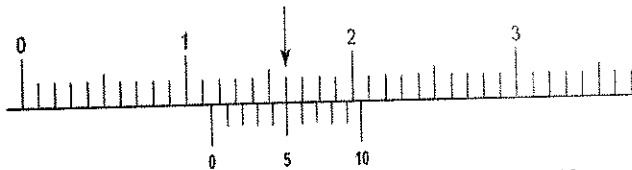
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Section – A

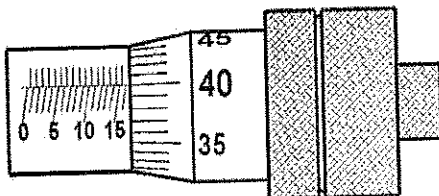
10X01 = 10 Marks

Q1. Which measurement can you read?



- | | |
|-------------|------------|
| (A) 11.9mm | (C) 11.5mm |
| (B) 11.04mm | (D) 12.5mm |

Q2. Which measurement can you read?



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

Q3. Which part does not belong to a Vernier caliper?

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

Q4. Which tool is a gauge?

- | | |
|-----------------|-----------|
| (A) Bevel angle | (C) Punch |
|-----------------|-----------|





(B) Protractor

(D) Vernier Caliper

Q5. With which tool can be measured 12.5 ± 0.3 ?

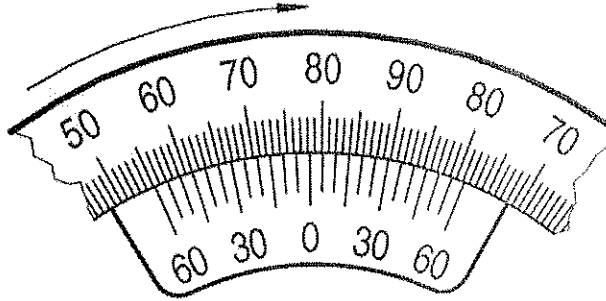
(A) Steel ruler

(C) Tape measure

(B) Micrometer gauge

(D) Folding rule

Q6. Read the measurement



(A) 78 degree 15 min.

(C) 79 degree 15 min.

(B) 81 degree 15 min.

(D) 81 degree 40 min.

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

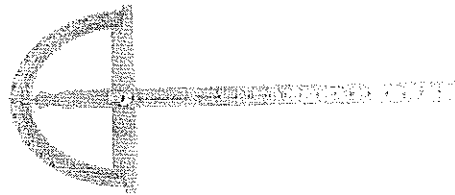
(A) divider

(C) Vernier caliper

(B) scribe

(D) pencil

Q8. Name the instrument



(A) divider

(C) Vernier caliper

(B) scribe

(D) protractor

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

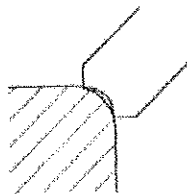
(A) accuracy

(C) least count

(B) tolerance

(D) error

Q10. What conclude from figure?



(A) radius too small

(C) radius large

(B) accurate radius

(D) can't say





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Section – B

04X04 = 16 Marks

- Q11. Explain subjective and objective testing.
- Q12. Name 8 different measuring instruments/gauges
- Q13. For what do we use block gauges?
- Q14. Write short note on measuring errors.

Section – C

04X06 = 24 Marks

- Q15. Explain the terms measuring and gauging and difference between them
- Q16. Write short note on measuring errors, why do we measure parts
- Q17. Make labelled diagram of Vernier calliper or micrometre
- Q18. We measure a part. First measure = 12.5mm/ second measure = 12.6mm/
Third measure = 12.4mm. Which reasons could it have?





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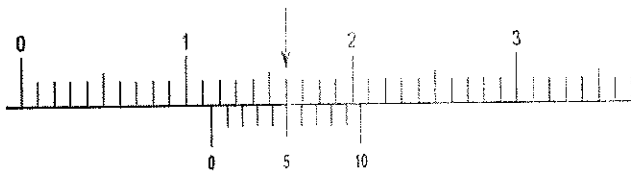
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Section – A

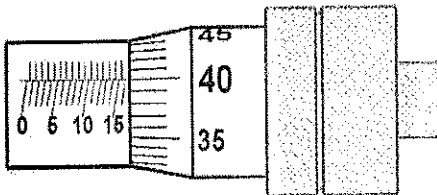
10X01 = 10 Marks

Q1. Which measurement can you read?



- (A) 11.9mm (C) 11.5mm
(B) 11.04mm (D) 12.5mm

Q2. Which measurement can you read?



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

Q3. Which part does not belong to a Vernier caliper?

- (A) Measuring jaw (C) Scale sleeve
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Q4. Which tool is a gauge?

- (A) Bevel angle (C) Punch

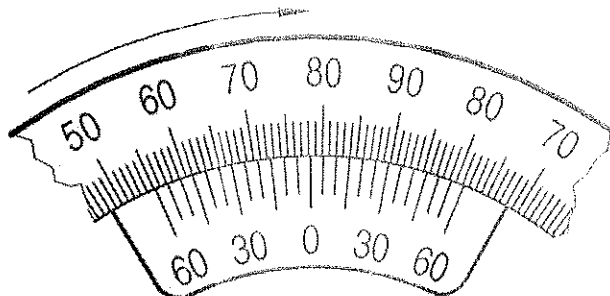




Q5. With which tool can be measured 12.5 ± 0.3 ?

- (A) Steel ruler
- (B) **Micrometer gauge**
- (C) Tape measure
- (D) Folding rule

Q6. Read the measurement

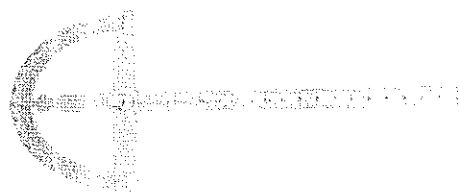


- (A) 78 degree 15 min.
- (B) 81 degree 15 min.
- (C) **79 degree 15 min.**
- (D) 81 degree 40 min.

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

- (A) **divider**
- (B) scribe
- (C) Vernier caliper
- (D) pencil

Q8. Name the instrument

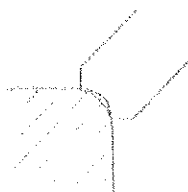


- (A) divider
- (B) scribe
- (C) Vernier caliper
- (D) **protractor**

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. What conclude from figure?



- (A) radius too small
- (B) **accurate radius**
- (C) radius large
- (D) can't say

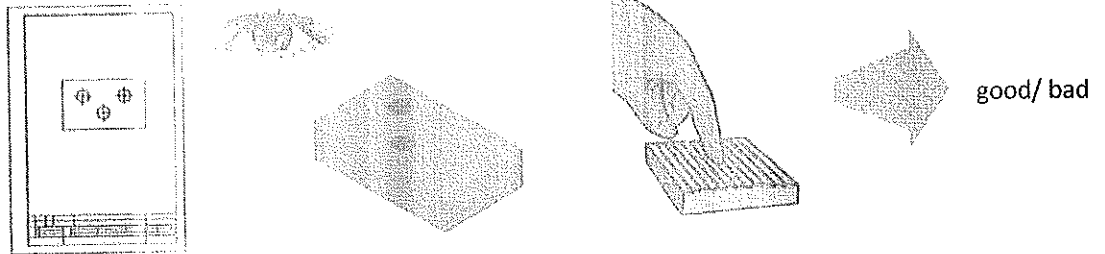




Q11. Explain subjective and objective testing.

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
Hole is missing

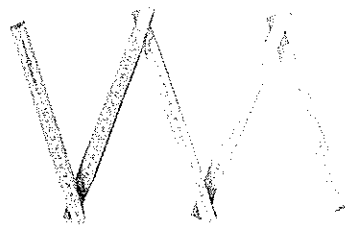
you can feel, that the surface is too rough

Objective testing

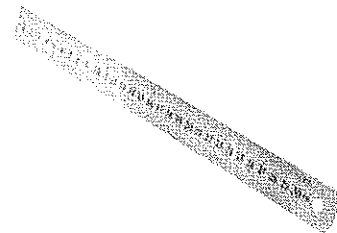
Objective test methods must produce results that always contain an measured value or a conclusion that is unequivocal. In other words, anyone carrying out the test using the same method must come to the same result.

Q12. Name 8 different measuring instruments/gauges

Ans.



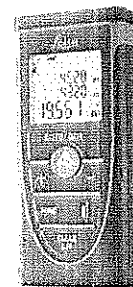
Folding rule



steel ruler



Protractor



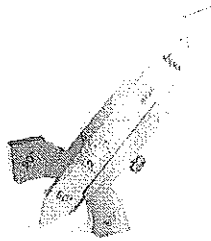
Laser measure



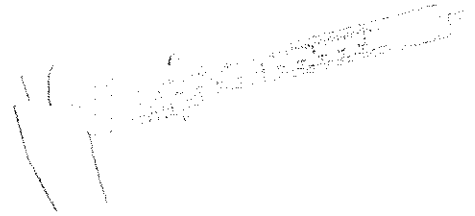




Tape measure



Micrometer gauge



Welding gauge

Vernier caliper

Q13. For what do we use block gauges?

Ans. Micrometer gauges must be checked from time to time in order to ensure that the measured values that they are delivering are correct.

Q14. Write short note on measuring errors.

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).

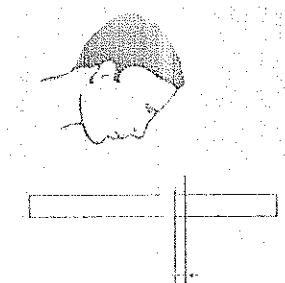
Workpieces/measuring depths must be clean and burr-free for measuring.

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.



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Section – C

04X06= 24 Marks

Q15. Explain the terms measuring and gauging and difference between them

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

Gauging is the process of determining whether 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.

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).

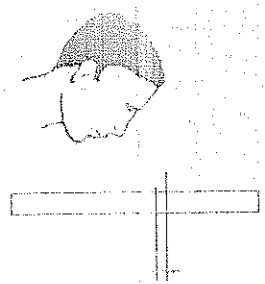
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Look at the reading from above.





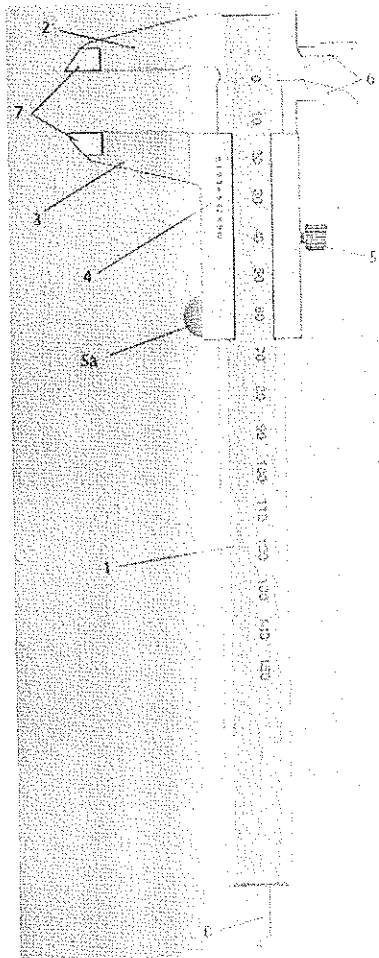
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The vernier gauge is a precision measuring tool and must therefore be protected against soiling and damage.

- 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



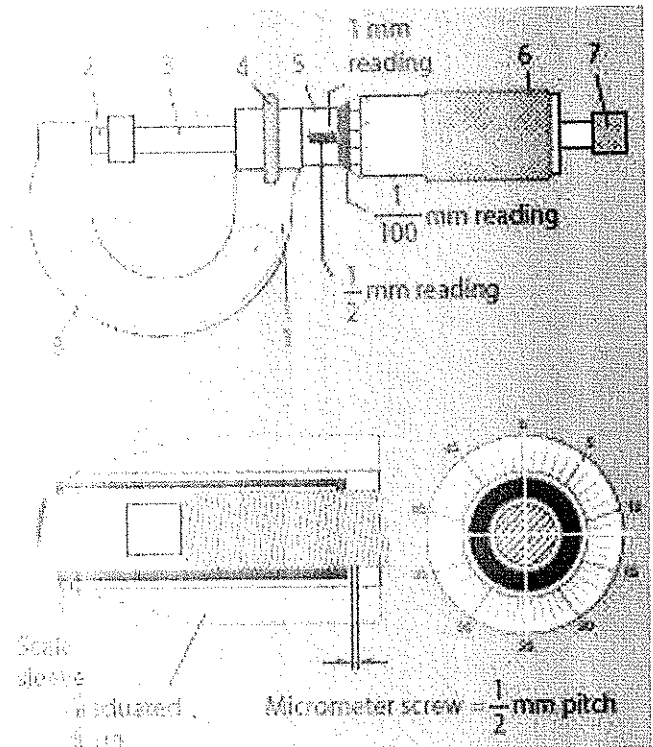


OR

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. 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.
- 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.





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Course Code: MCS1103

Course Name: Electrode welding (MMAW)

Time: 2 Hours

Max. Marks: 50

Instruction:

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3. Section A contains 10 Questions. Each question carries 1 Marks.
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Section – A

10X01 = 10 Marks

Q1. Why MMA electrode sticks to the workpiece?

- a.) Due to low current
- b.) due to less gape between electrode and workpiece.
- c.) both above
- d.) none of above.

Q2. Which is the non-destructive process of weld seam inspection?

- a.) bending test
- b.) breaking test
- c.) Ultra - sonic test
- d.) tensile test

Q3. Due to which effect the penetrant, penetrants into the weld seam in liquid penetration test.

- a.) friction
- b.) pressure
- c.) momentum
- d.) capillary action

Q4. Which is the optimal position for welding?

- a.) flat
- b.) horizontal
- c.) overhead
- d.) vertical

Q5. Which type of position 2G indicates?

- a.) horizontal fillet
- b.) vertical fillet
- c.) horizontal groove
- d.) vertical groove





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Q6. Which two metals can be joined by welding.

- a.) Mild steel to aluminium
- b.) aluminium to stainless steel
- c.) copper to mild steel
- d.) aluminium to aluminium

Q7. Which is not a permanent joint?

- a.) soldering
- b.) Brazing
- c.) riveting
- d.) screwing

Q8. Distortion in welding is occurs due to.

- a.) heat
- b.) Current
- c.) shielding gas
- d.) polarity

Q9. which process is used for protecting the base metal from wear out?

- a.) Soldering
- b.) hard facing
- c.) brazing
- d.) grooving

Q10. 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

Section – B

04X04 = 16 Marks

Q11. Classify MMA electrode based on covering type.

Q12. Give the tasks of electrode covering.

Q13. Define the arc blow.

Q14. When blowing effect occurs?

Section – C

04X06 = 24 Marks

Q15. Explain inner and outer weld seam faults. (Three each)

Q16. Explain destructive and non-destructive welding seam inspection procedure. (Three each)

Q17. Explain the welding symbol used in ISO in detail.

Q18. Explain "Pipe to Pipe and Pipe to Plate" welding positions in detail.





Sed - A
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Section – A

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Q1. Why MMA electrode sticks to the workpiece?

- a.) Due to low current
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- c.) **both above**
- d.) none of above.

Q2. Which is the non-destructive process of weld seam inspection?

- | | |
|-------------------------------|-------------------|
| a.) bending test | b.) Breaking test |
| c.) Ultra - sonic test | d.) Tensile test |

Q3. Due to which effect the penetrant, penetrants into the weld seam in liquid penetration test.

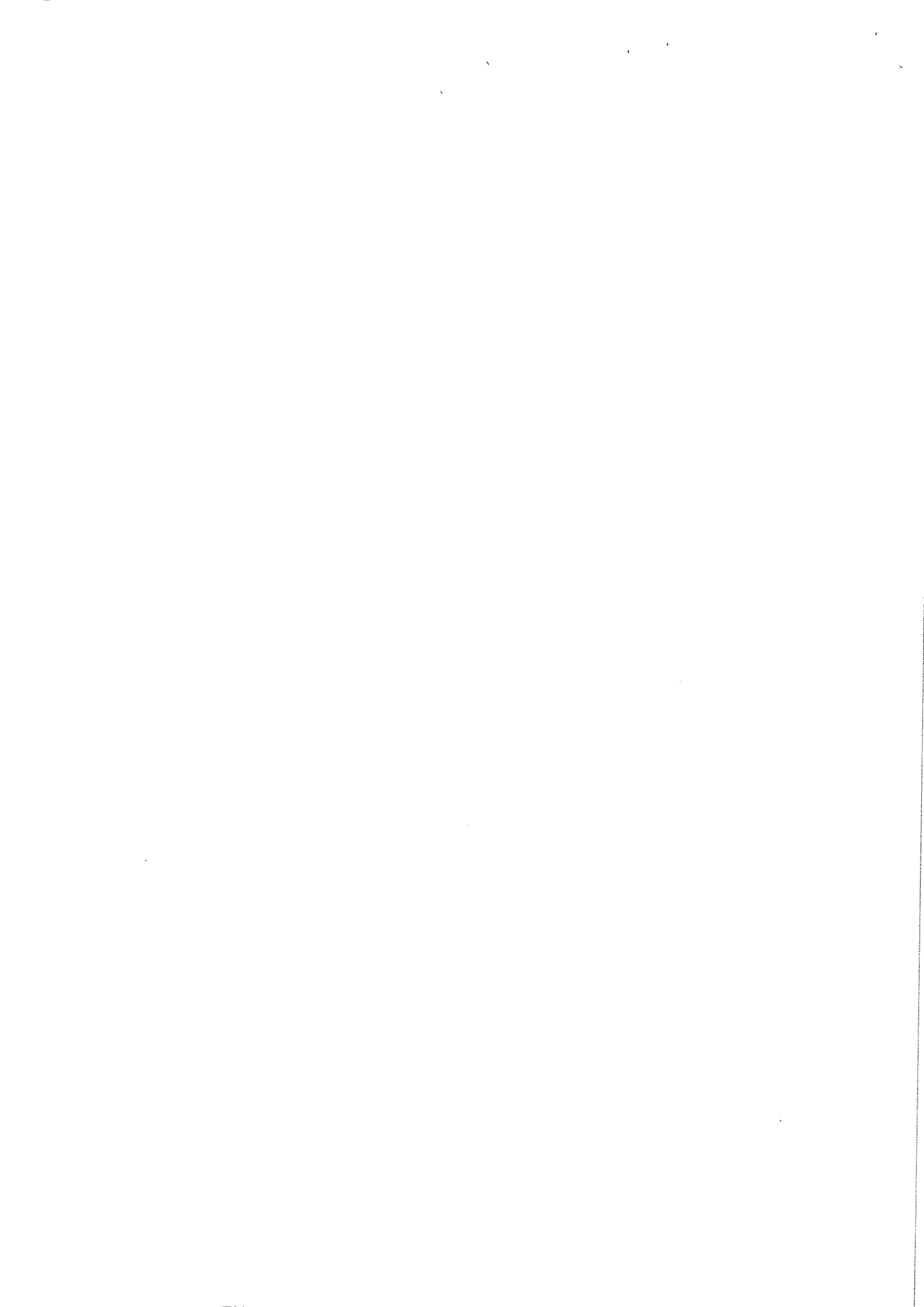
- | | |
|--------------|-----------------------------|
| a.) friction | b.) Pressure |
| c.) momentum | d.) Capillary action |

Q4. Which is the optimal position for welding?

- | | |
|-----------------|----------------|
| a.) flat | b.) Horizontal |
| c.) overhead | d.) Vertical |

Q5. Which type of position 2G indicates?

- | | |
|------------------------------|---------------------|
| a.) horizontal fillet | b.) Vertical fillet |
| c.) horizontal groove | d.) Vertical groove |





Q6. Which two metals can be joined by welding.

- a.) Mild steel to aluminium b.) Aluminium to stainless steel
c.) copper to mild steel d.) Aluminium to aluminium

Q7. Which is not a permanent joint?

- a.) soldering b.) Brazing
c.) riveting d.) Screwing

Q8. Distortion in welding is occurs due to.

- a.) heat b.) Current
c.) shielding gas d.) Polarity

Q9. Which process is used for protecting the base metal from wear out?

- a.) Soldering b.) Hard facing
c.) brazing d.) Grooving

Q10. 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

Section – B

04X04 = 16 Marks

Q11. Classify MMA electrode based on covering type.

Ans. Coating type

A = acid coating

B= basic coating

C= cellulose coating

R= rutile coating

Q12. Give the tasks of electrode covering.

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

Q13. Define the arc blow.

Ans. Magnetic fields are generated around the electrode, around the arc and around the work-piece.

These magnetic fields exert forces on the arc. Since the arc is movable, it is diverted by the magnetic

forces. This is known as the arc blow.



Q14. When blowing effect occurs?

Ans. A blowing effect only occurs when welding with direct current (DC). When welding with alternating current (AC), there is virtually no blowing effect, as the current is constantly changing its polarity. When welding steel, the blowing effect becomes particularly apparent, as the magnetic fields in the workpiece are very strong.

Section – C

04X06 = 24 Marks

Q15. Explain inner and outer weld seam faults. (Three each)

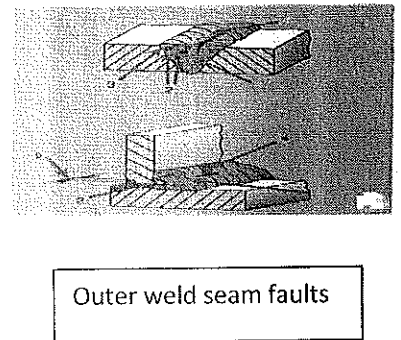
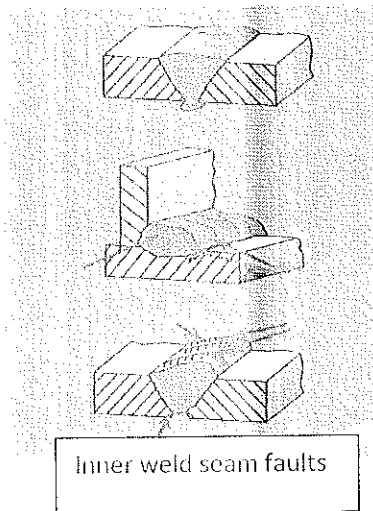
Ans.

Inner weld seam

1. Slag inclusion
2. Lack of fusion
3. Pores
4. Cracks
5. Poor fitting

Outer weld seam fault

1. Root sagging
2. Cracks
3. Seam too high (hump)
4. Undercuts
5. Root not welded through
6. Root uneven on each side



Q16. 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.



Q17. Explain the welding symbol used in ISO in detail.

Ans. Symbols are used in drawing to make welded seam easier to understand.

Reference sign: - The most important aspect here is the reference line. It consists of:

- Reference line (solid line)
- Arrow line
- Fork
- Dotted reference line

We differentiate between the reference and opposing side of the workpiece. The reference side is the side to which arrow line points.

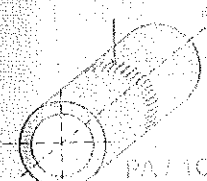
The intersection of the dotted reference line to the solid reference line indicates the side on which side the welded seam is produced.

Q18. Explain "Pipe to Pipe and Pipe to Plate" welding positions in detail.

Ans.


TECHNOLOGY

Welding Positions



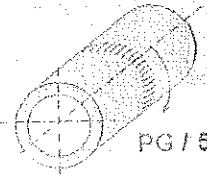
PA / 1G

Weld: Flat
Pipe: rotated
Axis: Horizontal



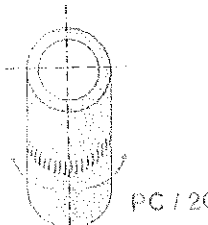
PF / 5G

Weld: Vertical upward
Pipe: Fixed
Axis: Horizontal



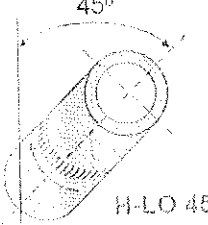
PG / 5G

Weld: Vertical Downwards
Pipe: Fixed
Axis: Horizontal



PC / 2G

Weld: Horizontal vertical
Pipe: Fixed
Axis: Vertical



45°

H-LO 45 / 6G

Weld: Upwards
Pipe: Fixed
Axis: Inclined

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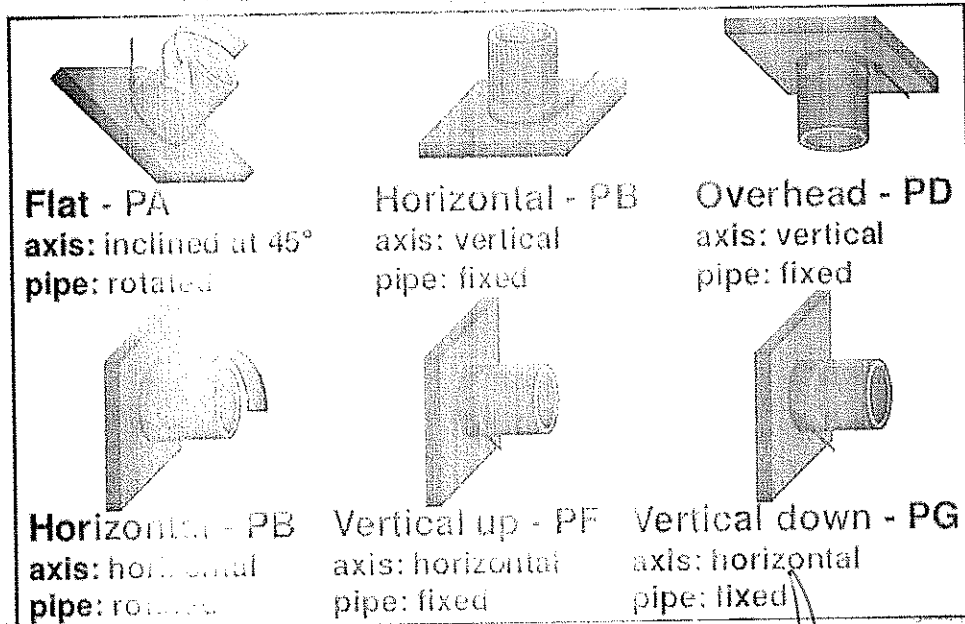
M S Rogers





Welding position designation 2.17

Fillet weld on pipe (ISO 6947)



Handwritten signature





BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
End-Sem. Examination

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 contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 4 Questions. Each question carries 4 Marks.
5. Section C contains 4 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

Q1. Which of the following gas mixture is used in TIG welding

- a) Argon + CO₂
- b) Argon + He
- c) He + H₂
- d) Argon + N₂

Q2. TIG welding best suited for

- a) Mild steel
- b) Stainless steel
- c) Aluminium
- d) Silver

Q3. Preheating is essential in welding for

- | | |
|----------------------|---------------------|
| (A) High speed steel | (C) Stainless steel |
| (B) Cast iron | (D) silver |

Q4. Which of the following is inert gas

- | | |
|--------------------|---------------------|
| (A) Argon | (C) CO ₂ |
| (B) H ₂ | (D) O ₂ |

Q5. Which current is used in TIG WELDING?

- | | |
|--------------------|-----------------------|
| (A) AC | (C) DC |
| (B) AC and DC both | (D) none of the above |





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Q6. Which of the following welding process uses non – consumable electrode?

- (A) MIG
- (B) FCAW
- (C) MMA
- (D) TIG

Q7. Which of the following tungsten electrode is best suited for welding Aluminium in TIG welding.

- a) Tungsten with 2% thorium
- b) Tungsten with 2% Zirconium
- c) Pure Tungsten
- d) Tungsten with 1.5% Lanthanum

Q8. Which polarity is used for welding Aluminium?

- (A) DCEP
- (B) AC
- (C) DCEN
- (D) DCEP AND DCEN

Q9. 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

Q10. What is ISO code for TIG WELDING?

- (A) 114
- (B) 136
- (C) 311
- (D) 141

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. What are the color code for tungsten electrode give any four?

Section – C

04X06 = 24 Marks

Q15. Draw the labelled view of TIG welding torch

Q16. How electrode shape depends upon welding current type and workpiece material?

Q17. Give the correct work technique with TIG

Q18. Compare TIG welding process in terms of advantage and disadvantages.





Sect. A
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
Answer sheet End-Sem. Examination

Course Code: MCS1104

Course Name: Tungsten inert gas welding (GTAW)

Time: 2 Hours

Max. Marks: 50

Instruction:

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- a) Argon + CO₂
- b) **Argon + He**
- c) He + H₂
- d) Argon + N₂

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- a) Mild steel
- b) Stainless steel
- c) **Aluminium**
- d) Silver

Q3. Preheating is essential in welding for

- | | |
|----------------------|---------------------|
| (A) High speed steel | (C) Stainless steel |
| (B) Cast iron | (D) silver |

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- | | |
|--------------------|---------------------|
| (A) Argon | (C) CO ₂ |
| (B) H ₂ | (D) O ₂ |

Q5. Which current is used in TIG WELDING?

- | | |
|---------------------------|-----------------------|
| (A) AC | (C) DC |
| (B) AC and DC both | (D) none of the above |





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Q6. Which of the following welding process uses non – consumable electrode?

- (A) MIG
- (B) FCAW
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- (D) TIG**

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- b) Tungsten with 2% Zirconium
- c) Pure Tungsten**
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- (A) DCEP
- (B) **AC**
- (C) DCEN
- (D) DCEP AND DCEN

Q9. 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

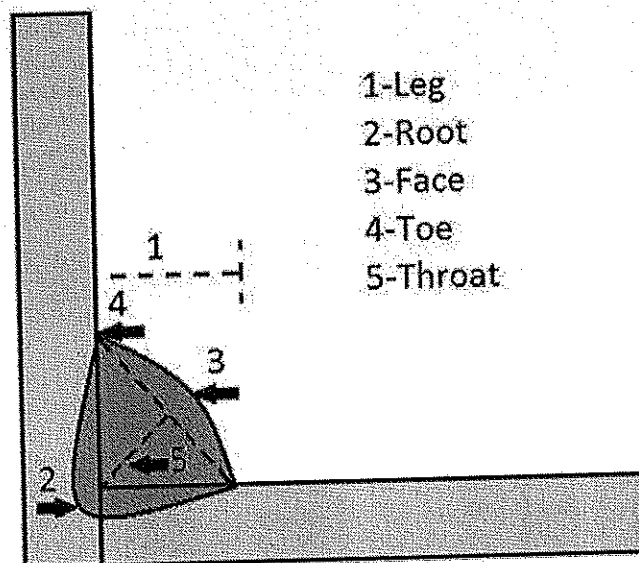
Q10. What is ISO code for TIG WELDING?

- (A) 114
- (B) **136**
- (C) 311
- (D) 141

Section – B

04X04 = 16 Marks

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







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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. What are the color code for tungsten electrode give any four?

Ans. Pure Tungsten (Color Code: Green)

Thoriated (Color Code: Red)

Ceriated (Color Code: Orange)

Lanthanated (Color Code: Gold)

Zirconiated (Color Code: Brown)

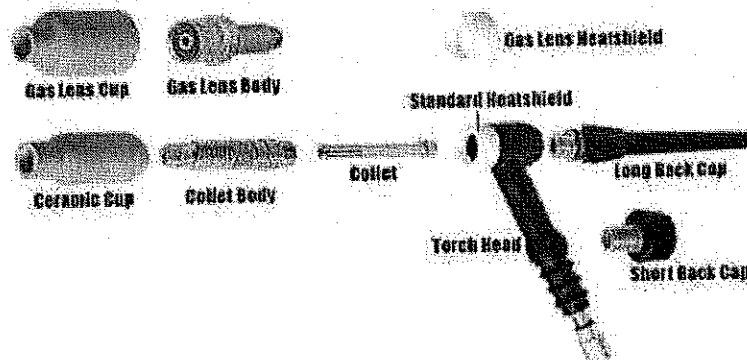
Rare Earth (Color Code: Gray)

Section – C

04X06 = 24 Marks

Q15. Draw the labelled view of TIG welding torch

Ans.



Q16. How electrode shape depends upon welding current type and workpiece material?

Ans. 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.





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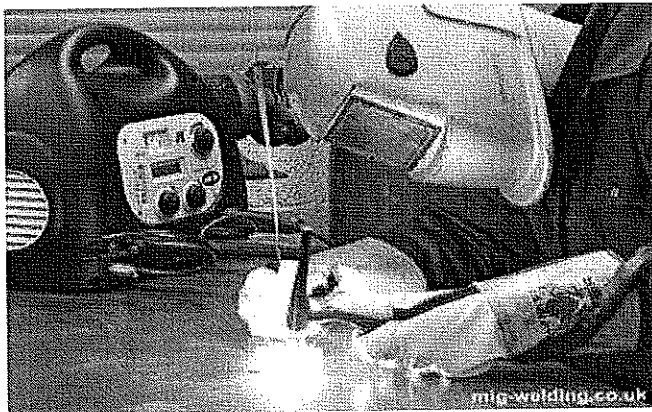
Q17. Give the correct work technique with TIG

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

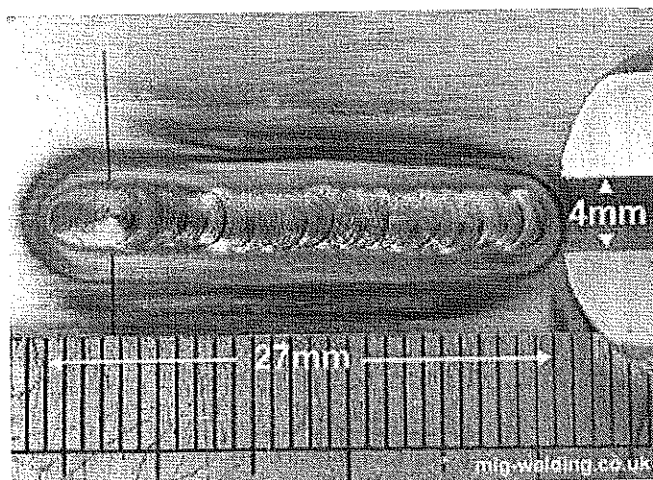


Torch Angle and Movement



Learning to TIG Weld

Arc Length



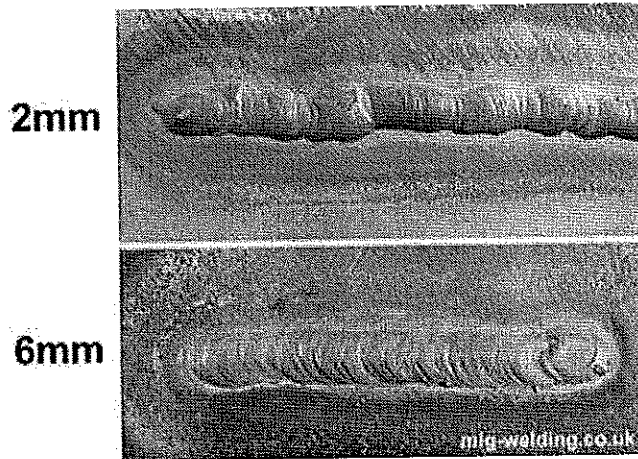




Size and Speed

Feeding TIG Filler Rods

Struggling practice more and more



Next Step – make some different joints like butt weld

Q18. 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.



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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.

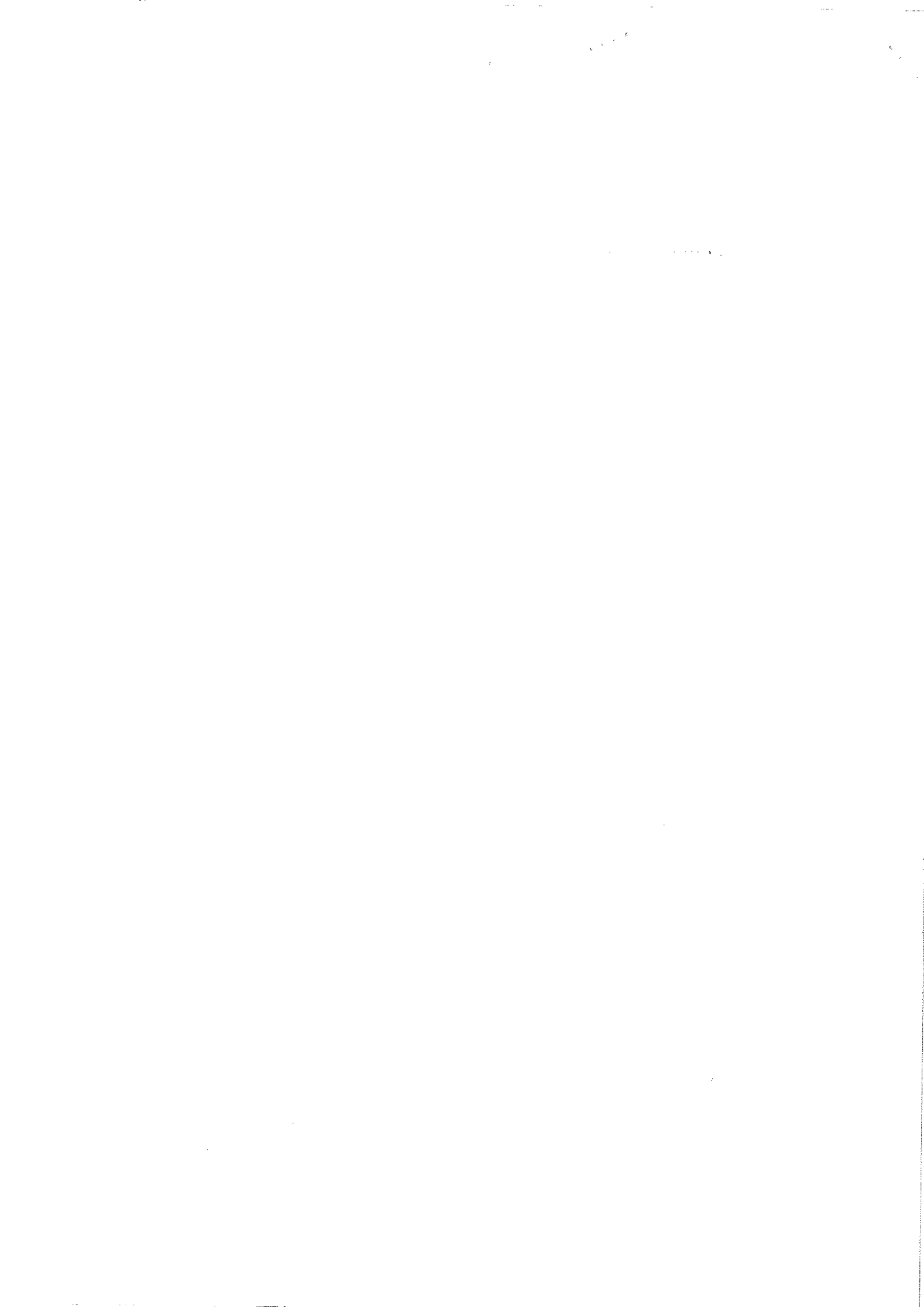
Disadvantages Of TIG:

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.





Set - A
BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
End-Sem. Examination

Course Code: MCS1105

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 ~~4~~ Questions. Each question carries ~~4~~ Marks.
5. Section C contains ~~4~~ Questions. Each question carries ~~6~~ Marks.

Section – A

10X01 = 10 Marks

Q1. Which of the following process use consumable electrode?

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

Q2. Which of the following gas used to weld Aluminium in MIG welding

- a) Pure argon
- b) CO₂
- c) Argon + CO₂
- d) Nitrogen

Q3. Which polarity MIG welding uses for mild steel

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

Q4. Which of the following is inert gas

- | | |
|--------------------|---------------------|
| (A) Argon | (C) CO ₂ |
| (B) H ₂ | (D) O ₂ |

Q5. Which polarity is used in GMAW?

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

Q6. In reverse polarity welding

- (A) Torch is negative and workpiece is positive
- (B) Torch is positive and workpiece is negative



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- (C) Torch is positive and workpiece is earthed
(D) Workpiece is negative and holder is earthed

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. Weld symbol for square butt joint is

- (A) II (C) X
(B) V (D) O

Q9. Weld spatter is

- (A) Flux (C) Welding defect
(B) Electrode coating (D) Welding test

Q10. Welding voltage range for MIG/MAG welding in spray transfer

- (A) 2v – 18v (C) 18v -31v
(B) 31v - 54v (D) 54v – 75v

Section – B

04X04 = 16 Marks

Q11. Differentiate b/w MIG and MAG welding

Q12. What is FCAW? How this is different from MAG Welding.

Q13. Write advantage of MIG/MAG welding.

Q14. Write down ISO Codes for MIG, MAG and FCAW (with gas) welding.

Section – C

04X06 = 24 Marks

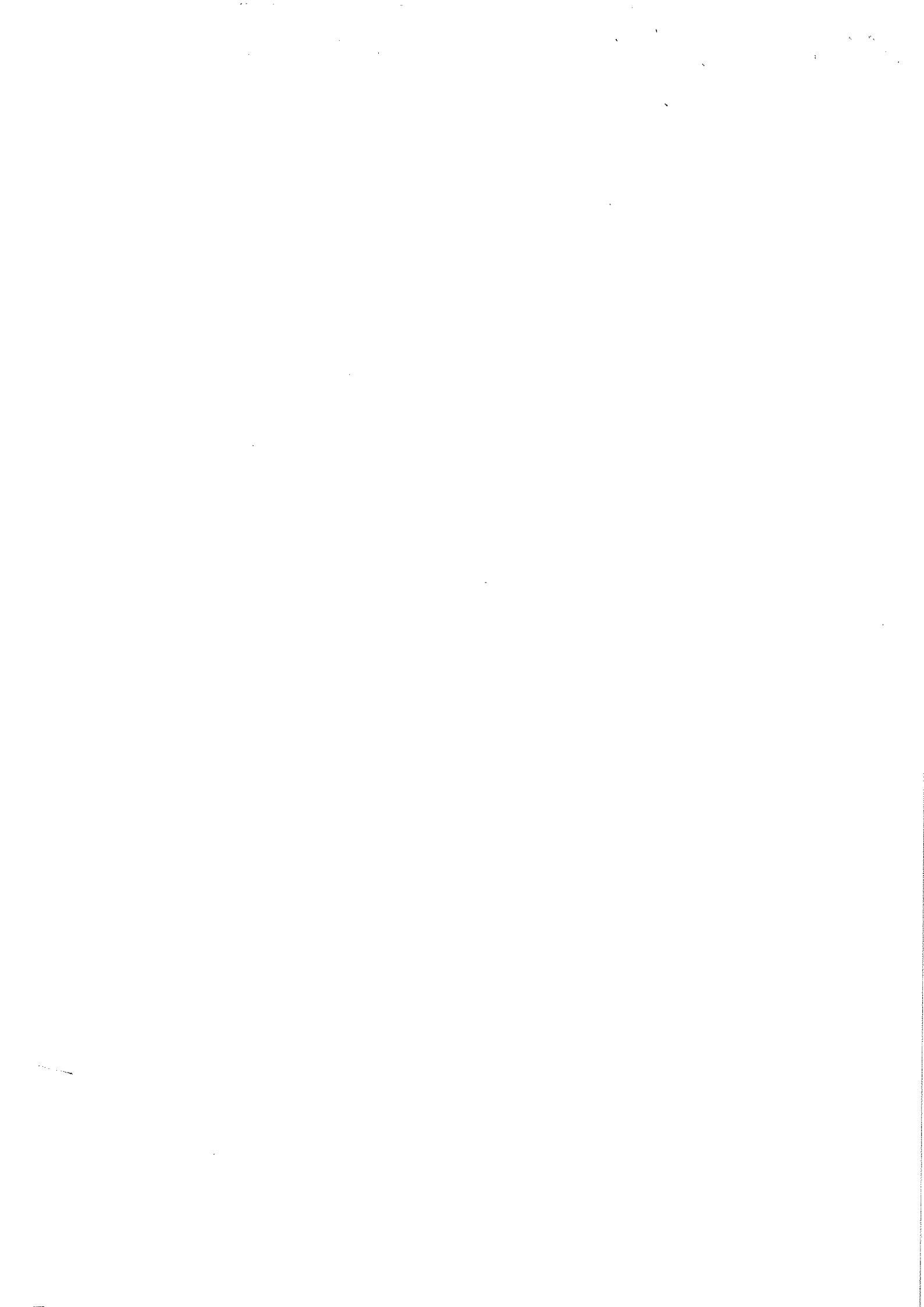
Q15. Describe in brief with diagram:

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

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

Q17. Give the name and describe spare parts used in MIG/MAG welding as consumables.

Q18. Describe what kind of material transfer in MIG/MAG welding.





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Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
Answer sheet End-Sem. Examination

Course Code: MCS1105

Course Name: *Inert gas welding (GMAW)*

Time: 2 Hours

Max. Marks: 50

Instruction:

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Section – A

10X01 = 10 Marks

Q1. Which of the following process use consumable electrode?

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

Q2. Which of the following gas used to weld Aluminium in MIG welding

- a) **Pure argon**
- b) CO₂
- c) Argon + CO₂
- d) Nitrogen

Q3. Which polarity MIG welding uses for mild steel

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

Q4. Which of the following is inert gas

- | | |
|--------------------|---------------------|
| (A) Argon | (C) CO ₂ |
| (B) H ₂ | (D) O ₂ |

Q5. Which polarity is used in GMAW?

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

Q6. In reverse polarity welding

- (A) Torch is negative and workpiece is positive
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- (C) Torch is positive and workpiece is earthed
(D) Workpiece is negative and holder is earthed

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- a) 0.15% C
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(B) Electrode coating (D) Welding test

Q10. Welding voltage range for MIG/MAG welding in spray transfer

- (A) 2v – 18v (C) 18v -31v
(B) 31v - 54v (D) 54v – 75v

Section – B

04X04 = 16 Marks

Q11. 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.

Q12. 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'.



Q13. 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

Q14. Write down ISO Codes for MIG, MAG and FCAW (with gas) welding.

Ans.

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

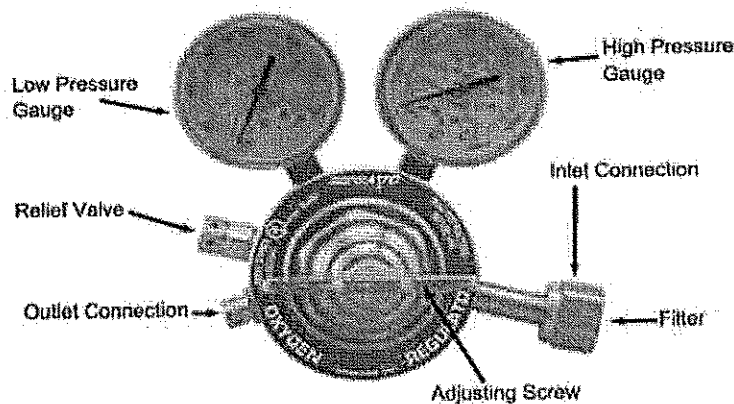
Section – C

04X06 = 24 Marks

Q15. Describe in brief with diagram:

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

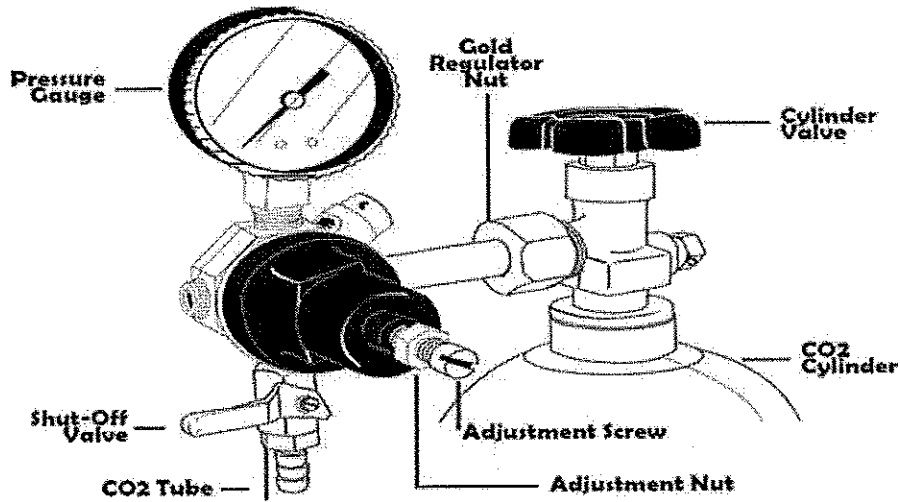
Ans. a) a pressure regulator is a control valve that reduces the input pressure of a fluid to a desired Value as its output.



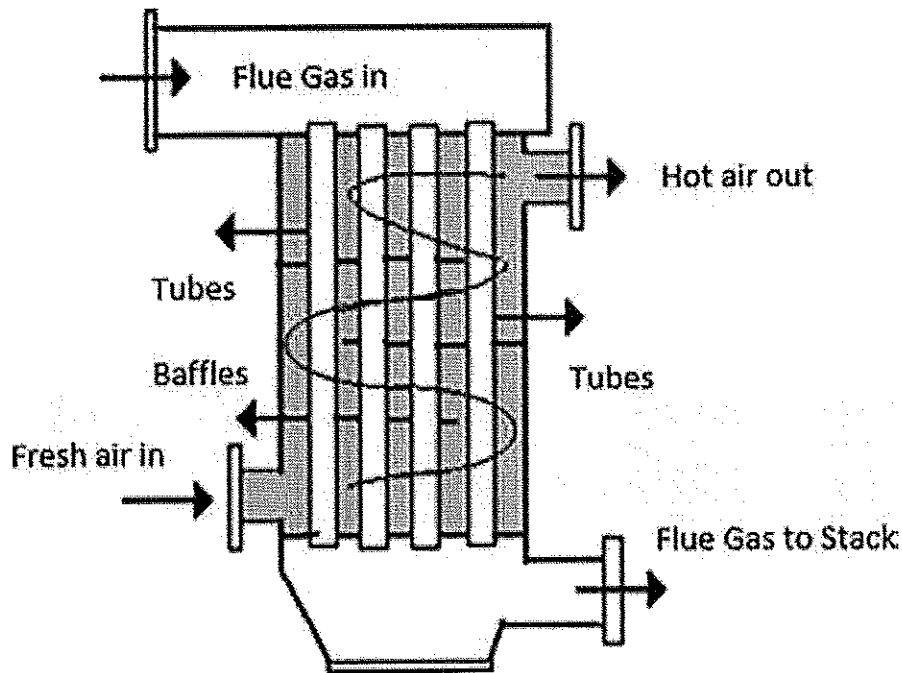


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- b) This valve allows the cylinder to contain gases and allows gas to be filled into or emptied from the cylinder



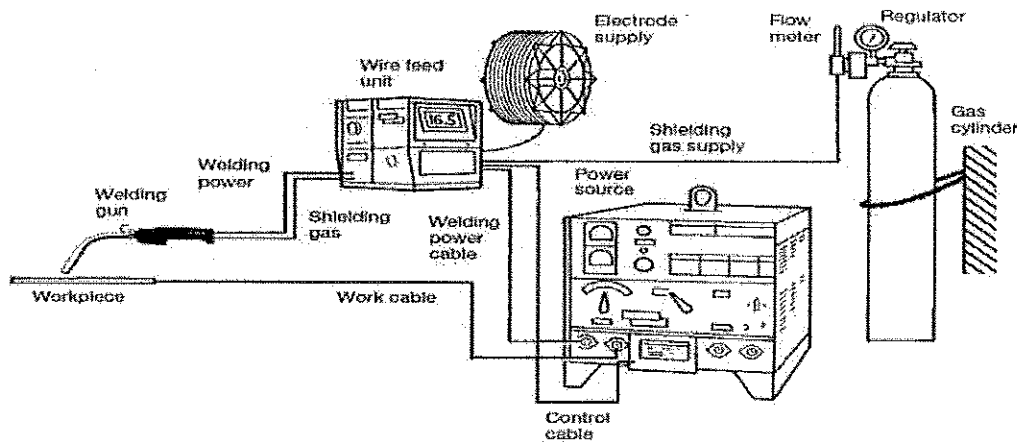
- c) The pre-heater is used to prevent the formation of hydrate due to a pressure and temperature drop across the pressure regulator.



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. 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

Q18. 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.



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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.





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Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
End-Sem. Examination

Course Code: MCS1106

Course Name: Brazing/ Soldering/ oxy-fuel processes

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 4 Questions. Each question carries 4 Marks.
5. Section C contains 4 Questions. Each question carries 6 Marks.

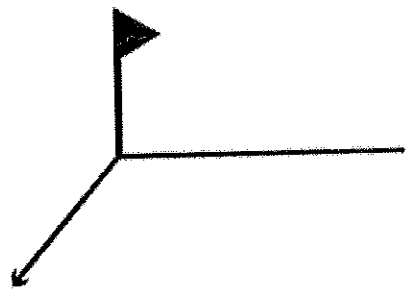
Section – A

10X01 = 10 Marks

Q.1: What is the welding code for oxy acetylene welding?

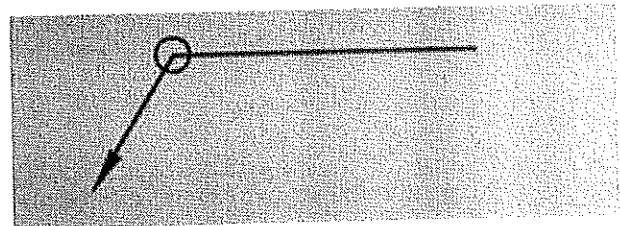
- | | |
|--------|--------|
| a. 111 | b. 131 |
| c. 311 | d. 136 |

Q.2: What is the meaning of given symbol?



- | | |
|---------------------------|--------------------|
| a. Construction site weld | b. peripheral weld |
| c. Before weld | d. Without weld |

Q.3: What is the meaning of given symbol?



- | | |
|---------------------------|--------------------|
| a. Construction site weld | b. peripheral weld |
| c. Before weld | d. Without weld |





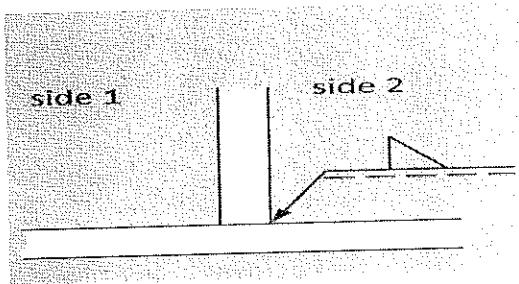
Q.4: Which weld inspection process uses "red liquid penetrant"?

- a. X- ray Inspection
- b. Liquid penetrant test
- b. ultra-sonic testing
- d. breaking test

Q.5: Which process gives the strength of weld seam?

- a. X- ray Inspection
- b. Liquid penetrant test
- b. ultra-sonic testing
- d. breaking test

Q.6: Which side should be welded?

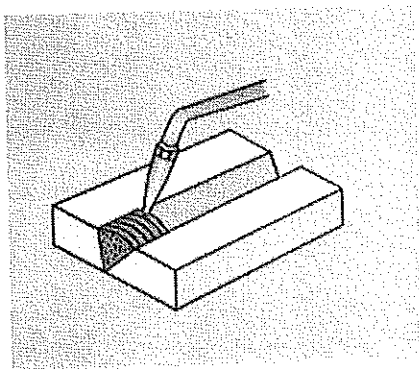


- a. side 1
- b. side 2
- c. both sides
- d. side not given

Q.7: Which is the destructive weld-seam inspection process?

- a. X- ray Inspection
- b. Liquid penetrant test
- b. ultra-sonic testing
- d. breaking test

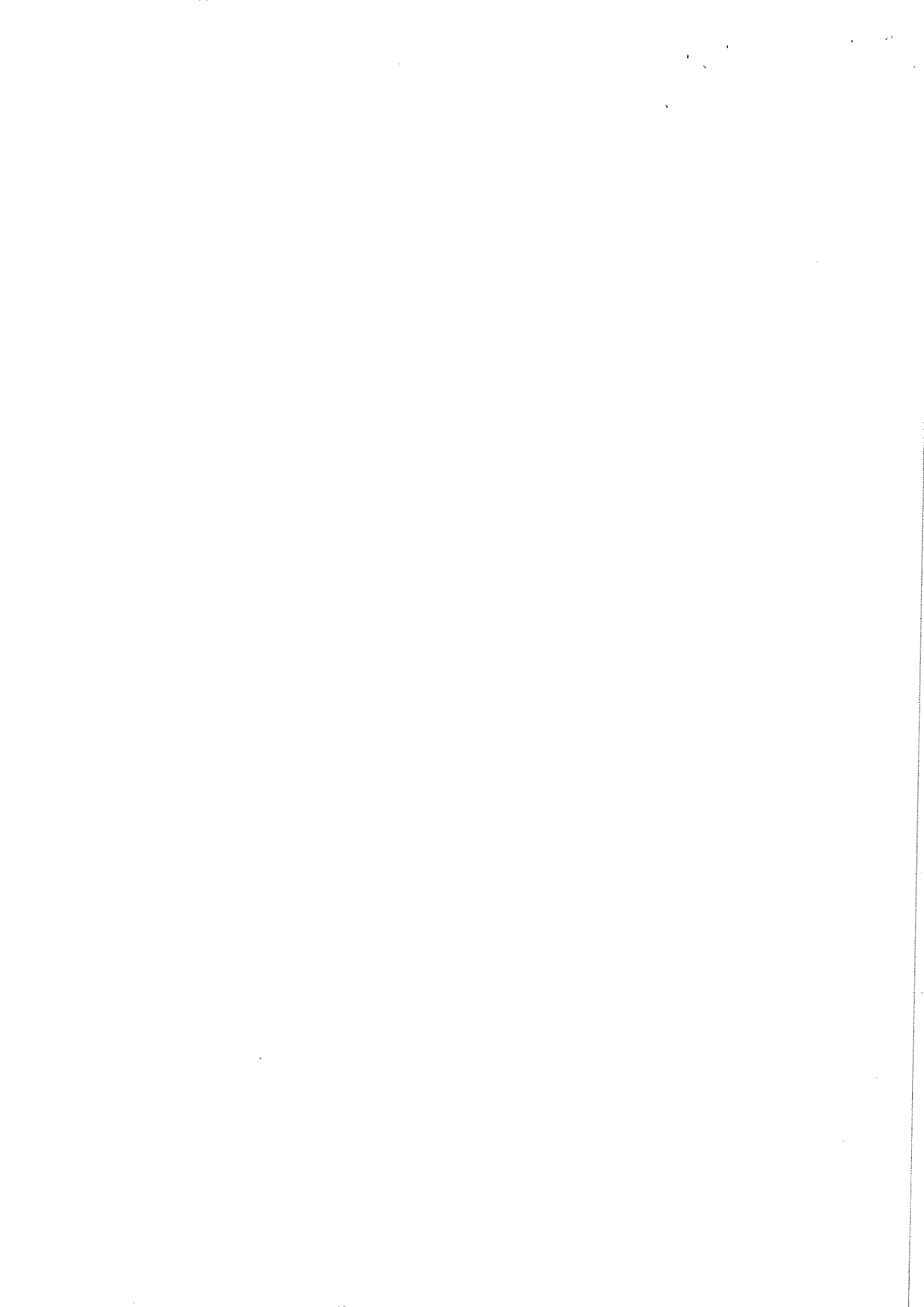
Q.8: What is the designation for this weld position?



- a. Horizontal Position
- b. V-position
- c. Flat position
- d. longitudinal position

Q.9: What generates heat, in oxy-fuel welding?

- a. Flame
- b. Plasma
- b. Arc
- d. friction energy





Q.10: Where oxygen and acetylene mixes to each other?

- a. In cylinders
- b. In flashback arrestor
- d. In hose pipe
- d. In torch

Section – B

04X04 = 16 Marks

Q.11. Write short note on fuel gases for oxy-acetylene welding.

Q.12: Write short note on acetylene cylinder in oxy-acetylene welding.

Q.13: What are the occupational safety for oxy-acetylene welding?

Q.14: What is control valve? Write short note on control valve use.

Section – C

04X06 = 24 Marks

Q.15: What is weld seam inspection? Explain in detail destructive and non-destructive weld seam inspection procedures.

Q.16: Explain all plate-to-plate welding positions.

Q.17: Explain Tacking process with examples.

Q.18: What is welding defects? Explain inner and outer weld defects. (Three each)





Set - A
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Registration No.:

School of Metal Construction Skills
Session: 2019-20 (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:

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 ~~4~~ Questions. Each question carries ~~4~~ Marks.
5. Section C contains ~~4~~ Questions. Each question carries ~~6~~ Marks.

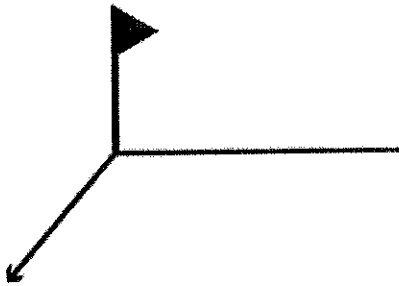
Section – A

10X01 = 10 Marks

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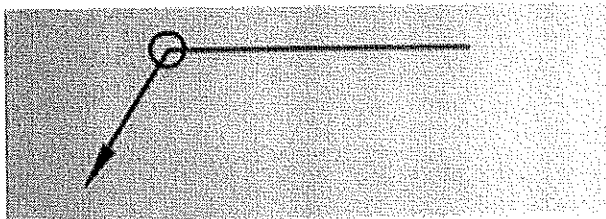
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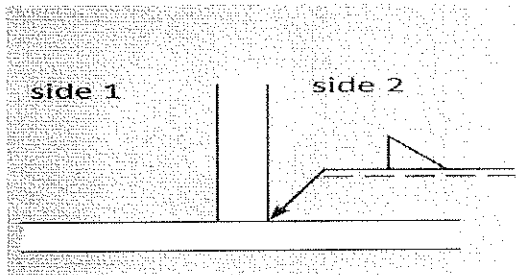
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Q.6: Which side should be welded?

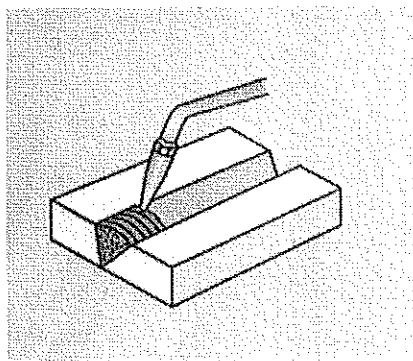


- a. side 1
- b. **side 2**
- c. both sides
- d. side not given

Q.7: Which is the destructive weld-seam inspection process?

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- b. **Liquid penetrant test**
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- d. breaking test

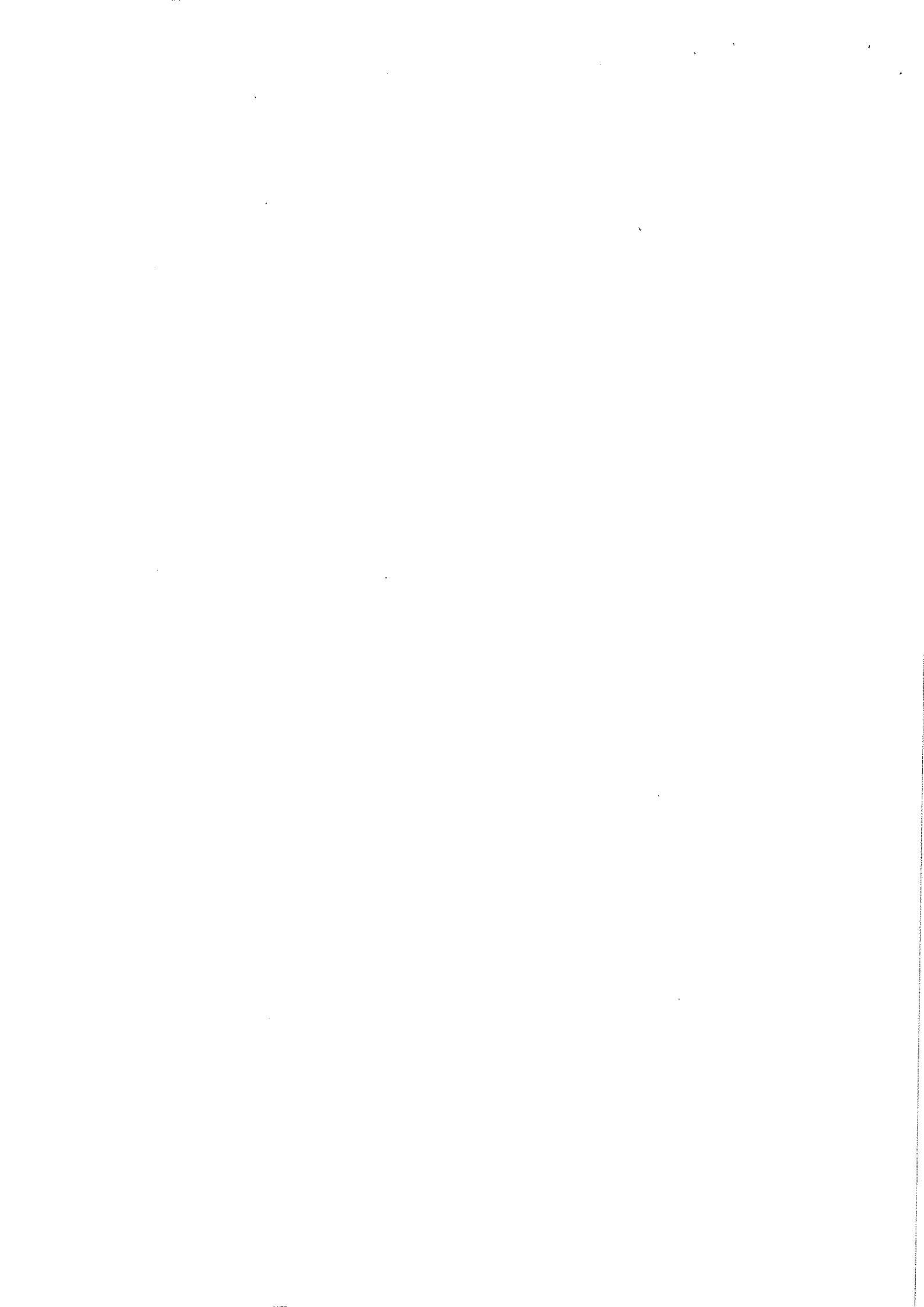
Q.8: What is the designation for this weld position?



- a. Horizontal Position
- b. V-position
- c. **Flat position**
- d. longitudinal position

Q.9: What generates heat, in oxy-fuel welding?

- a. **Flame**
- b. Arc
- c. Plasma
- d. friction energy



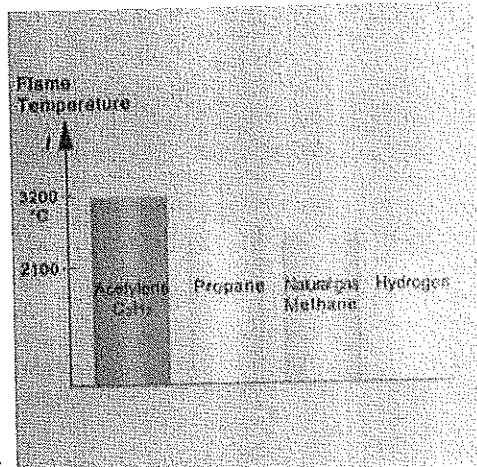
Q.10: Where oxygen and acetylene mixes to each other?

- a. In cylinders
- b. In flashback arrestor
- c. In hose pipe
- d. In torch

Section – B

04X04 = 16 Marks

Q.11. Write short note on fuel gases for oxy-acetylene welding.



Fuel Gases

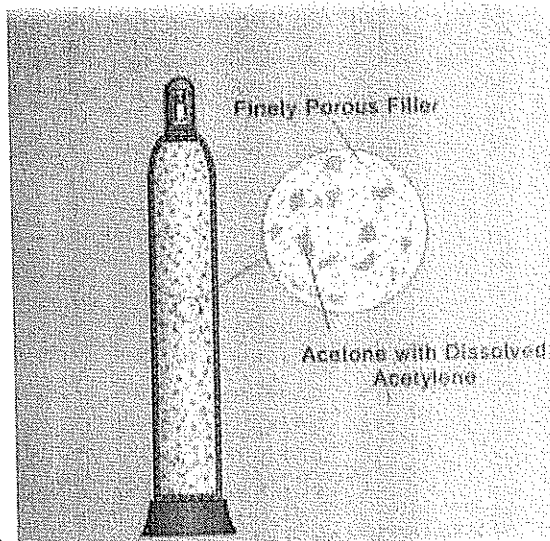
The flame temperatures required for welding can only be reached by burning the fuel gas with pure oxygen.

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.

Ans.

Q.12: Write short note on acetylene cylinder in oxy-acetylene welding.



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.

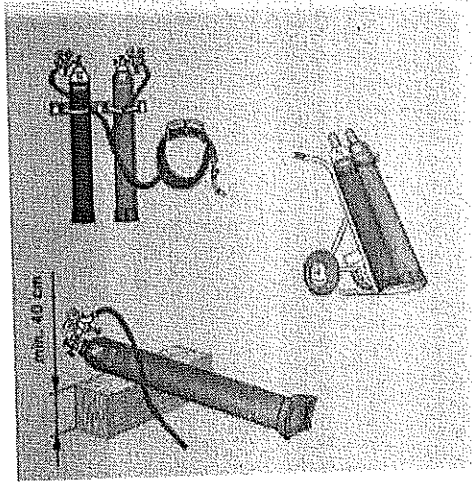
In this way, it is possible to safely charge the cylinders to pressures up to 19 bars.

Ans.



Q.13: What are the occupational safety for oxy-acetylene welding?

Ans.

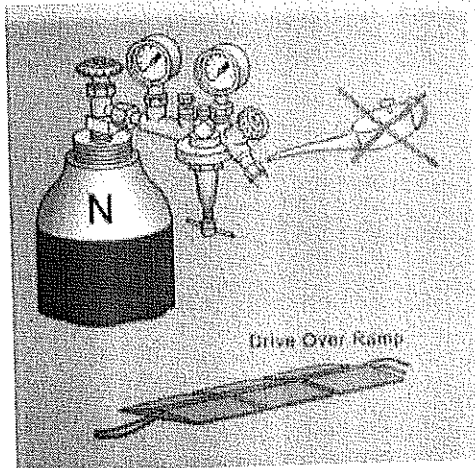


Occupational Safety

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.



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.

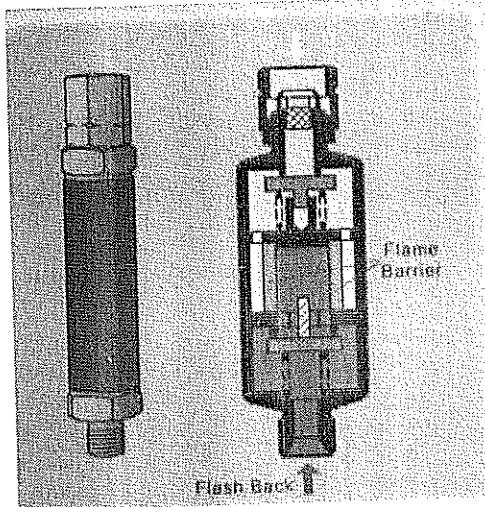
- Protect gas cylinders against heat, frost, and impacts.

- Ensure good work place ventilation.

- Protect hoses against sparks, hot work piece particles and being driven over by vehicles.

Q.14: What is control valve? Write short note on control valve use.

Ans.



Control Valve

Every gas hose must be equipped with a check valve, the so-called, control valve.

It ensures that the gas can only flow in one direction.

In addition, the control valve has a barrier made of sintered metal, which intercepts torch flash backs before they can reach the cylinder.



Q.15: What is weld seam inspection? Explain in detail destructive and non-destructive weld seam inspection procedures.

Ans. . Inspecting the quality of weld seam by destructive and non-destructive process is weld seam inspection.

Weld Seam Inspection procedures:

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

Breaking Test: A diagram showing a hammer striking a weld joint.

Tension Test: A diagram showing a weld joint being pulled apart by a force F .

Bend Test: A diagram showing a weld joint being bent around a block by a force F .

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 mechanically 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.

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.

Liquid Penetrant Procedure: A diagram showing a liquid being applied to a crack in a weld.

Ultrasonic Testing: A diagram showing an ultrasonic probe connected to a control unit.

X-Ray Inspection: A diagram showing an X-ray source and a detector positioned around a weld joint.

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.

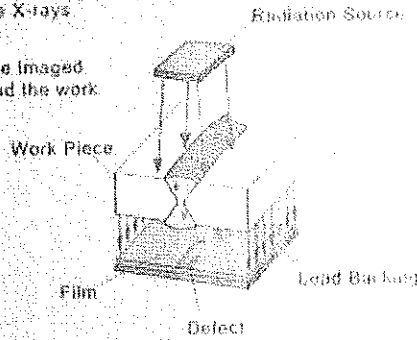
After drying, a white powder is applied which makes the red color visible.



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.



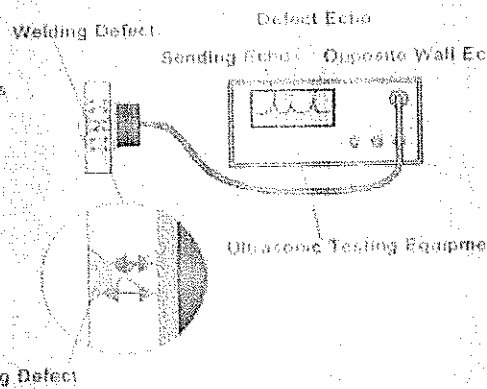
Ultrasonic Testing

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.



Q.16: Explain all plate-to-plate welding positions.

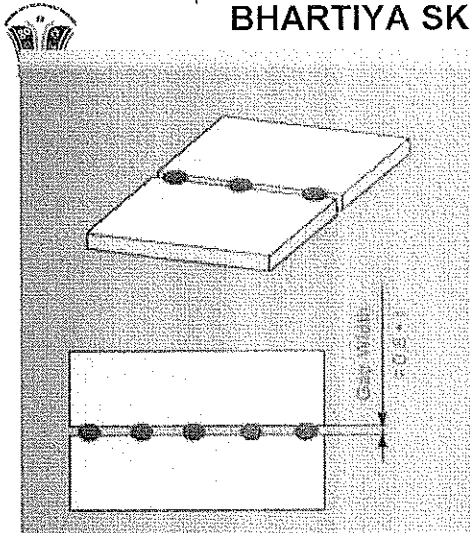
Ans.

	Abbreviation	Designation	Main Position: Description
	1G	Horizontal Groove	Seam center line vertical, flat welding, top layer up
	2F	Horizontal Fillet	Horizontal welding, top layer up
	3G (up)	Vertical Groove (up)	Vertical up welding
	3F (down)	Vertical Fillet (down)	Vertical down welding
	2G	Horizontal Groove	Seam center line horizontal, horizontal welding
	4G	Overhead Groove	Horizontal welding, seam center line vertical, top layer down
	4F	Overhead Fillet	Horizontal welding, overhead, top layer down
	1F	Horizontal Fillet	Horizontal welding, seam center line vertical, top layer up

Q.17: Explain Tacking process with examples.

Ans.





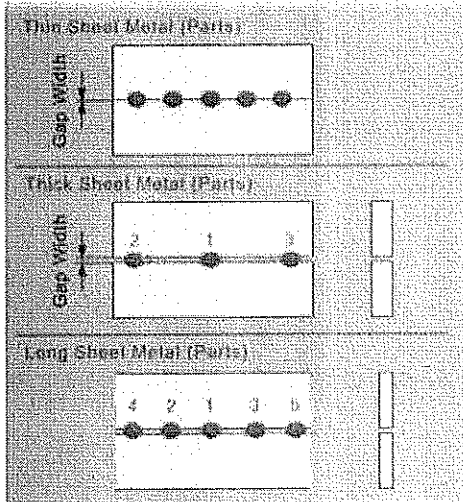
Tacking

To prevent the work pieces from shifting, they are joined together at several places with weld spots.

This procedure is known as tacking.

Tacking is performed in several steps.

- Align work pieces with consistent gap width.
- Gap width = $\frac{\text{Metal thickness}}{2}$
- Clamp work pieces.
- Join pieces with weld spots.



Examples

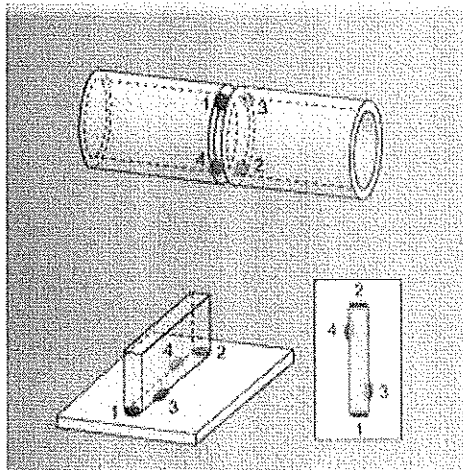
The gap width, the tack spacing and the tack order are determined by, among other things, the thickness of the work piece.

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.



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.

Q.18: What is welding defects? Explain inner and outer weld defects. (Three each)

Ans. Welding Defects can be defined as the irregularities formed in the given weld metal due to wrong welding process or incorrect welding patterns, etc.

External Welding Defects:

1. Weld Crack
2. Undercut





3. Porosity
4. Overlap
5. Crater

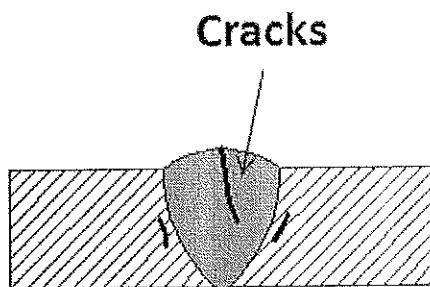
Internal Welding Defects:

1. Incomplete Fusion
2. Necklace cracking
3. Incompletely filled groove or incomplete penetration

External Welding Defects

1. Weld Crack

This is the most unwanted defect of all the other welding defects. Welding cracks can be present at the surface, inside of the weld material or at the heat affected zones.

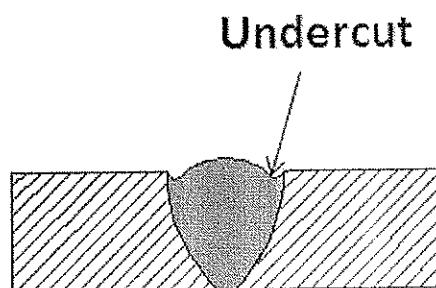


Crack can also appear at different temperatures:

Hot Crack – It is more prominent during crystallization of weld joints where the temperature can rise more than 10,000-degree Celsius.

Cold Crack – This type of crack occurs at the end of the welding process where the temperature is quite low. Sometimes cold crack is visible several hours after welding or even after few days.

2. Undercut

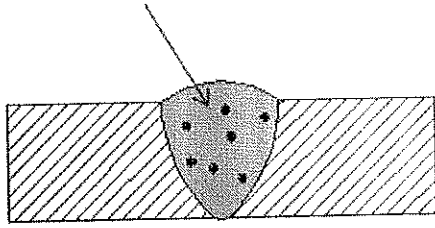


When the base of metal melts away from the weld zone, then a groove is formed in the shape of a notch, then this type of defect is known as Undercut. It reduces the fatigue strength of the joint.

3. Porosity



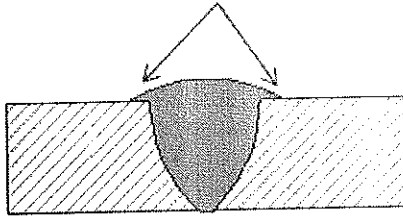
Porosity



Porosity in the condition in which the gas or small bubbles gets trapped in the welded zone.

4. Overlap

Overlap



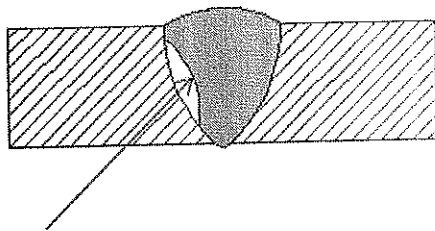
When the weld face extends beyond the weld toe, then this defect occurs. In this condition the weld metal rolls and forms an angle less than 90 degrees.

5. Crater

It occurs when the crater is not filled before the arc is broken, which causes the outer edges to cool faster than the crater. This causes a stress and then crack is formed.

Inter

1. Incomplete Fusion



Incomplete Fusion

Incomplete fusion occurs when the welder does not accurately weld the material and the metal pre solidifies which leads to a gap which is not filled with the molten metal.

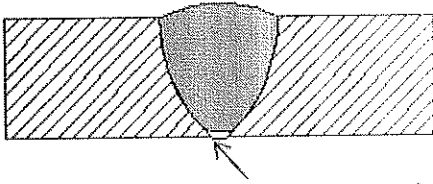
2. Necklace Cracking



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It occurs in the use of electron beam welding where the weld does not penetrate properly. Therefore, the molten metal does not flow into the cavity and results in a cracking known as "Necklace Cracking".

3. Incompletely Filled Groove or Incomplete Penetration



Incomplete Penetration

These defects occur only in the butt welds where the groove of the metal is not filled completely. It is also called as incomplete penetration defect.



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Registration No.:

School of Metal Construction Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, I-Semester,
End-Sem. Examination

Course Code: MCS1107

Course Name: Elementary drawing understanding

Time: 2 Hours

Max. Marks: 50

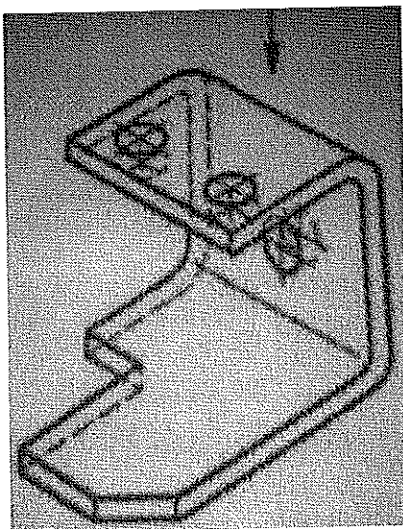
Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 05 Questions. Each question carries 1 Marks.
4. Section B contains 03 Questions. Each question carries 2 Marks.
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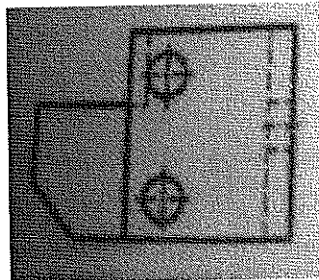
Section – A

10X01 = 10 Marks

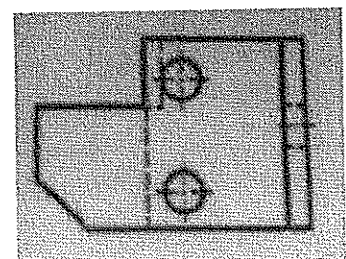
1. Continuous thin wavy line is use for showing _____
 - a) Dimension lines
 - b) Extension lines
 - c) Short break lines
 - d) Long break lines
2. What kind of dimensioning system exist?
 - a) Aligned system & Directional system
 - b) Unidirectional system & Aligned system
 - c) Parallel & Perspective
 - d) Perpendicular or horizontal.
3. Which is the correct top view (arrow side) of the represented body?



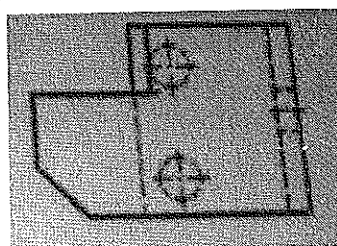
a)



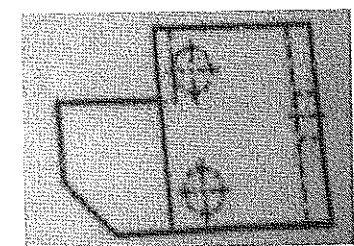
c)

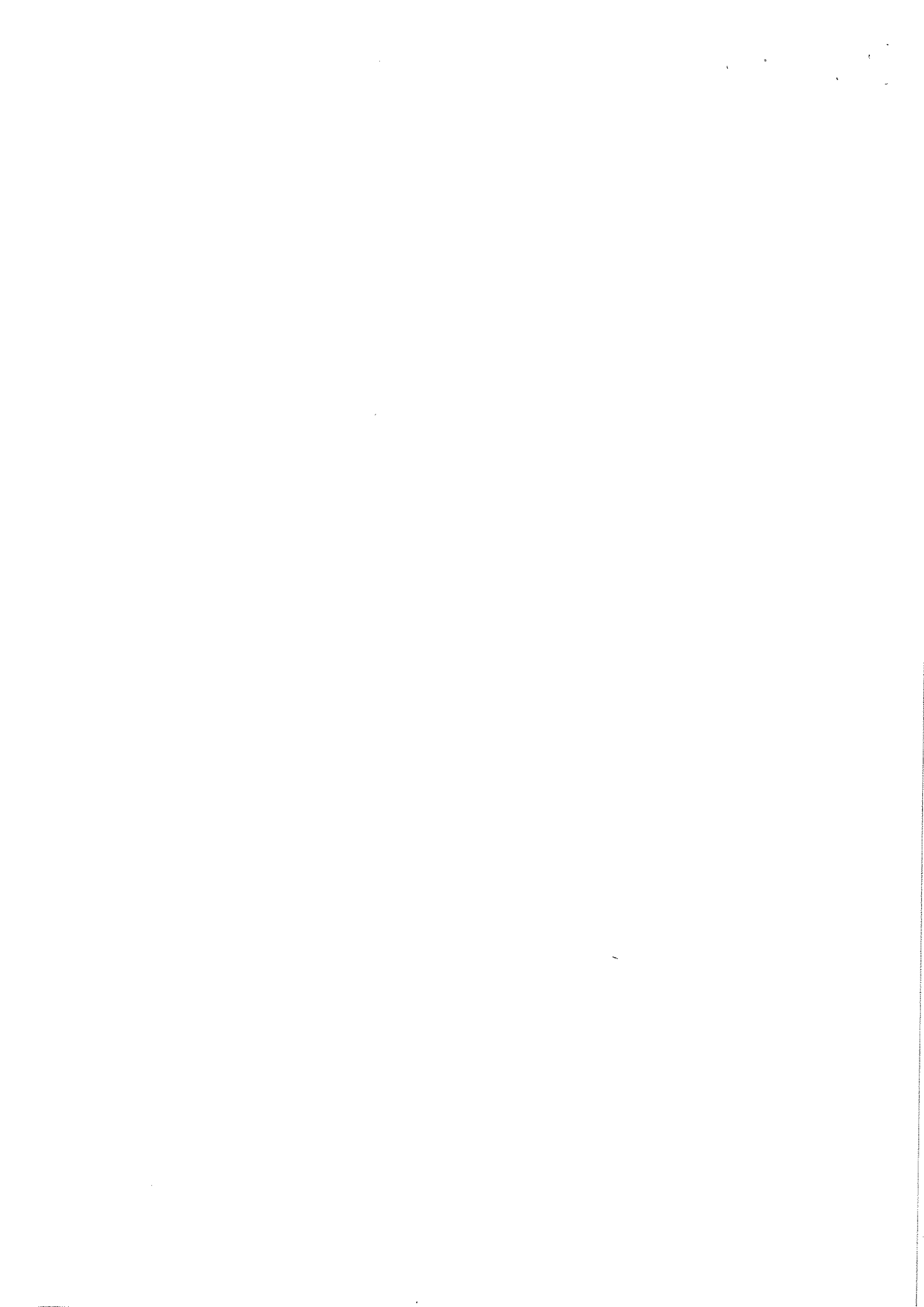


b)


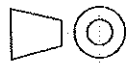


d)







4. Which one is not a type of orthographic drawing?
- a) General drawing c) Perspective drawing
b) Exploded drawing d) Component drawing
5.  This is a _____ symbol.
- a) Straightness c) Symmetry
b) Rectangularity d) Flatness
6. Which are the following detail not belonging to the title box?
- a) Bill of material c) Scale
b) Date of drawing d) Legal owner of the drawing
7. In perspective projection the object is placed at _____.
- a) Infinity distance c) Finite distance
b) Out of visible range d) Not clearly says
8.  This symbol shows angle projection.
- a) 1st angle c) 4th angle
b) 2nd angle d) 3rd angle
9. In first angle projection object kept in which quadrant?
- a) First quadrant c) Second quadrant
b) Third quadrant d) Fourth quadrant
10. Which view is belongs to the orthographic projection?
- a) Isometric view c) Oblique view
b) Multi-view d) All of them

Section – B

04X04 = 16 Marks

Q11. What do you mean by engineering drawing?

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

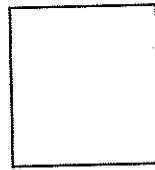
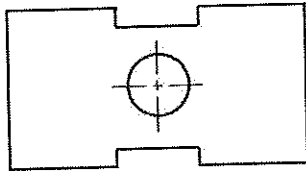
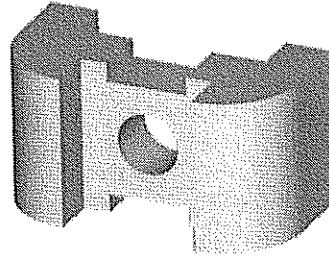
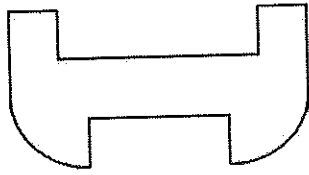
Q13. Why we don't make drawing in second or fourth angle projection?





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Q14. Give all necessary dimensions to the drawings given below:



Section – C

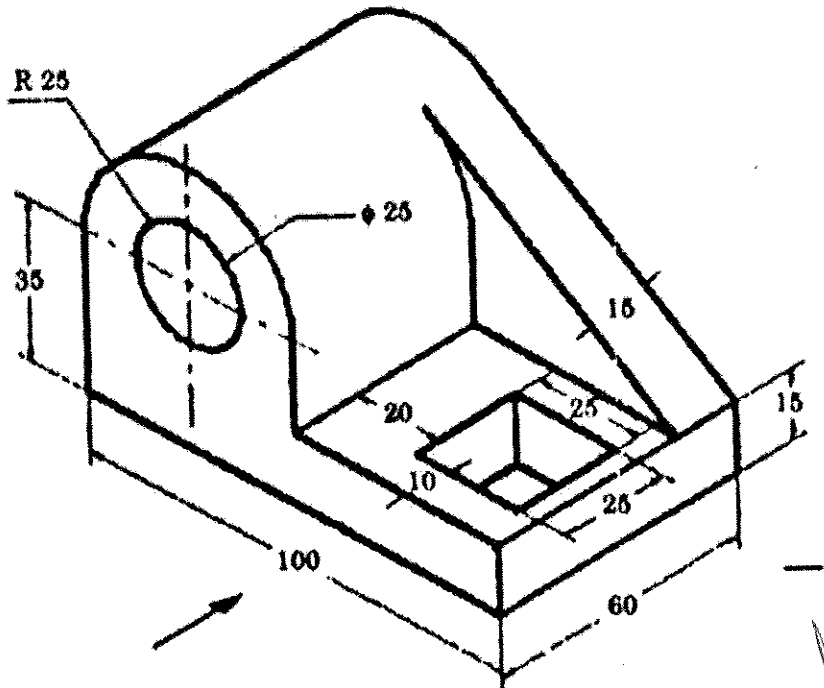
04X06 = 24 Marks

Q15. What do you mean by projection and its variables explain it with drawing?

Q16. Explain first and third angle projection.

Q17. Explain different types of Lines.

Q18. Draw the all multi-view of this drawing.



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Sol - A
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Registration No.:

School of Metal Construction Skills
Session: 2019-20 (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 contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 4 Questions. Each question carries 4 Marks.
5. Section C contains 4 Questions. Each question carries 6 Marks.

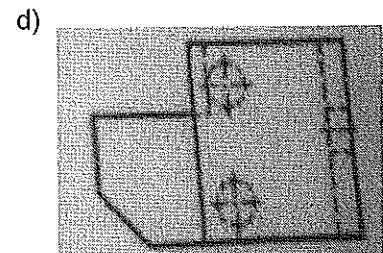
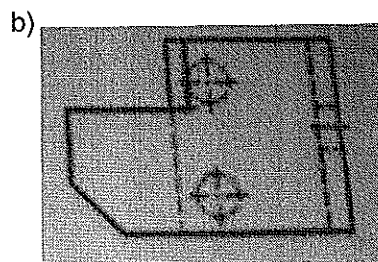
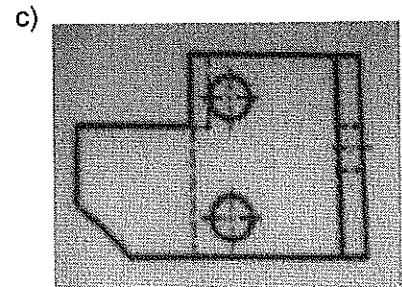
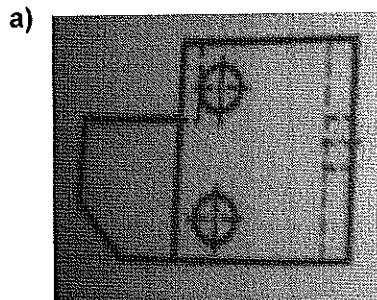
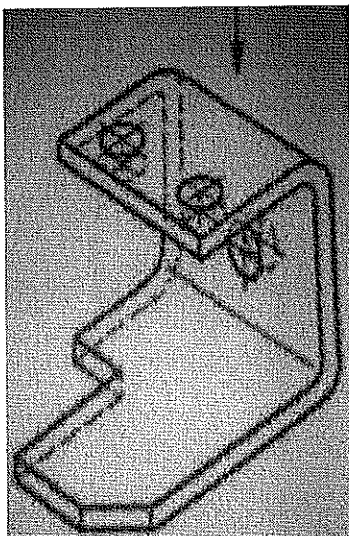
Section – A

10X01 = 10 Marks

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

2. What kind of dimensioning system exist?
a) Aligned system & Directional system
b) **Unidirectional system & Aligned system**
c) Parallel & Perspective
d) Perpendicular or horizontal.



3. Which is the correct top view (arrow side) of the represented body?







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4. Which one is not a type of orthographic drawing?
- a) General drawing c) **Perspective drawing**
b) Exploded drawing d) Component drawing
5.  This is a _____ symbol.
- a) Straightness c) Symmetry
b) Rectangularity d) **Flatness**
6. Which are the following detail not belong to the title box?
- a) **Bill of material** c) Scale
b) Date of drawing d) Legal owner of the drawing
7. In perspective projection the object is placed at _____.
- a) Infinity distance c) **Finite distance**
b) Out of visible range d) Not clearly says
8.  This symbol shows _____ angle projection.
- a) 1st angle c) 4th angle
b) 2nd angle d) **3rd angle**
9. In first angle projection object kept in which quadrant?
- a) **First quadrant** c) Second quadrant
b) Third quadrant d) Fourth quadrant
10. Which view is belongs to the orthographic projection?
- a) Isometric view c) Oblique view
b) Multi-view d) **All of them**
c)

Section – B

04X04 = 16 Marks

Q11. What do you mean by engineering drawing and why we need drawings?


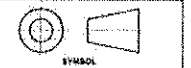


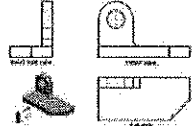

Ans: - Drawing is a graphical means of expressions of technical details without the barrier of a language. Engineering drawing is the universal language for engineer.

Reasons for technical drawings.

- Information exchange
- Efficient communication
- A picture (a drawing) says more than thousand words
- Clear up misunderstandings
- Technical documentation

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

Ans: -

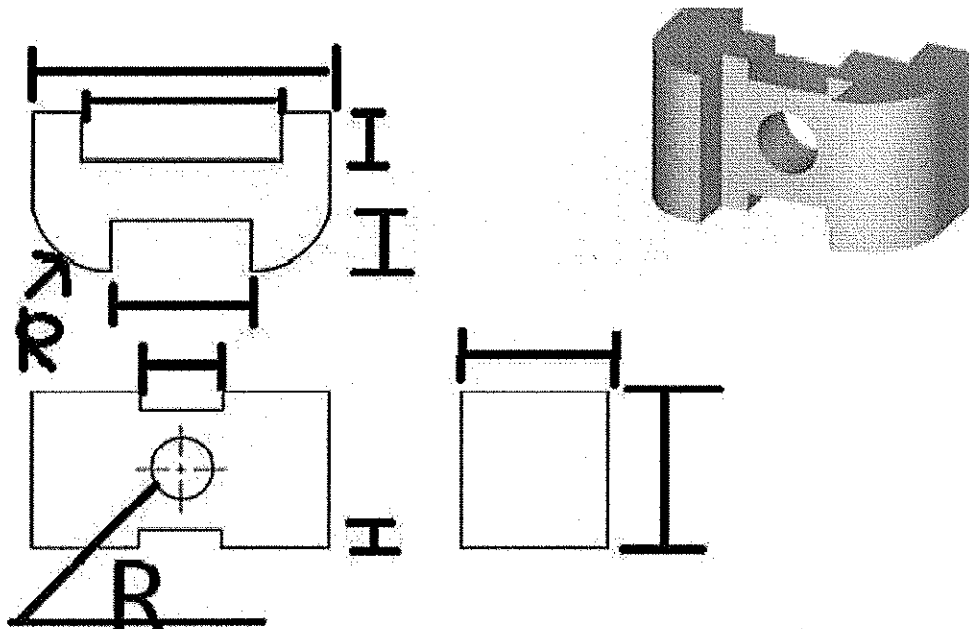
First Angle Projection	Third Angle Projection
The object is imagined to be in first quadrant.	The object is imagined to be in third quadrant.
The object lies between the observer and plane of projection.	The plane of projection lies between the observer and object.
The plane of projection is assumed 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. Why we not make drawing in second or fourth angle projection?

Ans: - Because of overlapping of front and top views 2nd and 4th angle projections are not used. First and third angle projection systems are recommended for orthographic projections. And it's also very complicated

Q14. Give all necessary dimensions to the drawing.

Ans: -





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Section – C

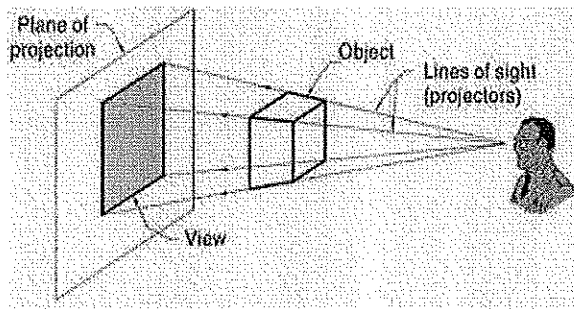
04X06 = 24 Marks

Q15. What do you mean by projection and its variables explain it with drawing?

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".

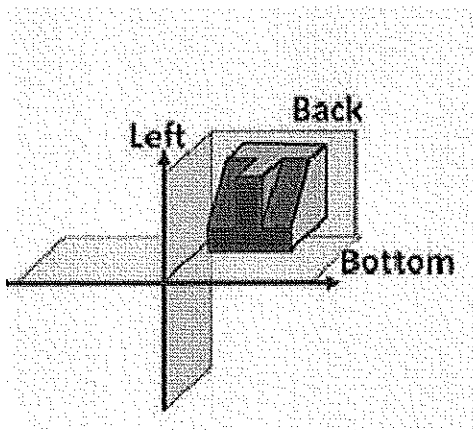
There are two variables.

- Line of sight
- Plane of projection.

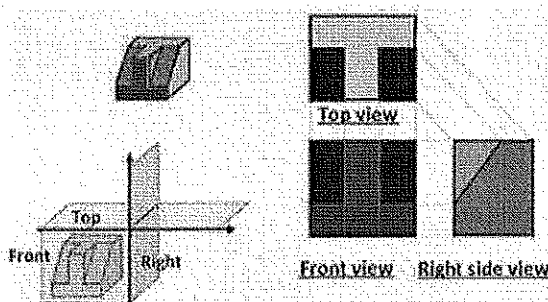


Q16. Explain first and third angle projection.

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.


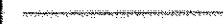
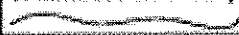


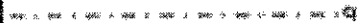



Third angle projection: - In this the object assumed to be in third quadrant. The plane of projection is placed b/w observer and object.

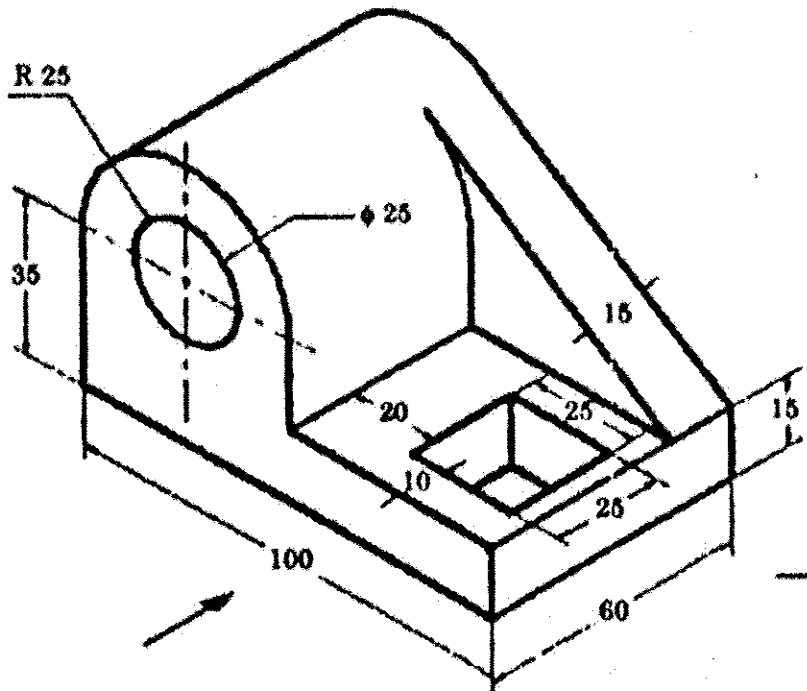


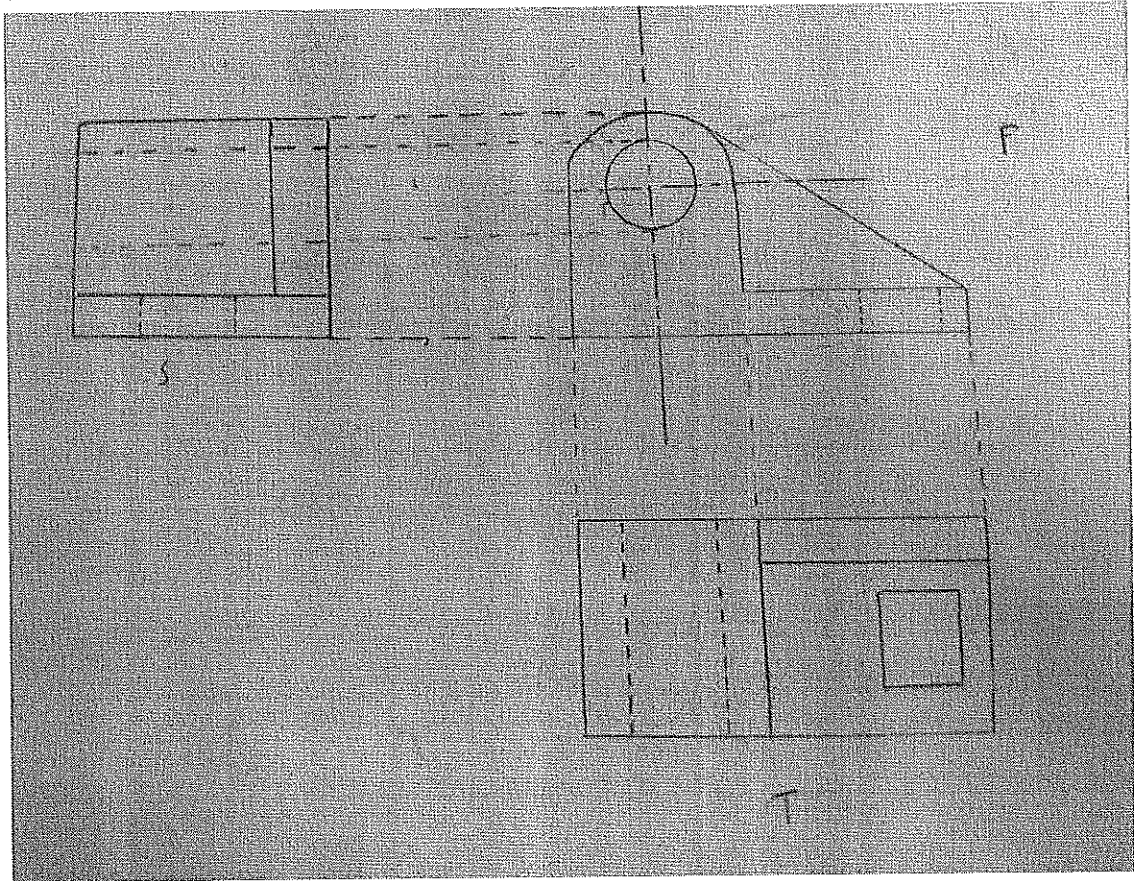
Q17. Explain different types of Lines.

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 1st angle projection.





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