BHARTIYA SKILL DEVELOPMENT UNIVERSITY
SCHOOL OF POLYMECHANIC SKILLS
1st SEMESTER, 2nd IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1001_B
Course Name: Handskills
Time (Minutes): 60
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

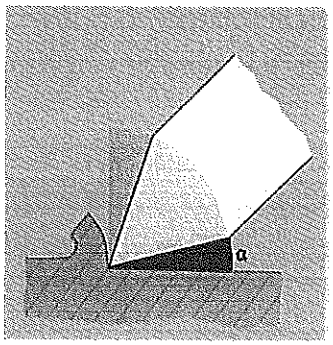
Section- A

1. When the tool wedge will penetrate deeper into the work piece?
   a) When the work piece material is harder than the tool material
   b) When a tool is used of large wedge angle
   c) When the work piece material is softer than the tool material
   d) When less force is applied on the tool
2. A wedge angle β should always be chosen:
   a) As large as possible
   b) As small as possible, but as large as necessary
   c) As large as possible, but as small as necessary
   d) As small as possible
3. In which process we can't define the cutting-edge geometry?
   a) Chiseling
   b) Drilling
   c) Sawing
   d) Grinding
4. Which one is not the part of chip formation process?
   a) Compression
   b) Tension
   c) Shearing
   d) Sliding

5. Which chisel is used in making cavities and slots?
    a) Flat chisel
    b) Cape chisel
    c) Web chisel
    d) Round nose chisel
6. After scribing, base plate is to be used as a base for hammering or layout punching.
    a) True
    b) False
7. Layout punch marks are used as... **(More than one Option)**
    a) Start point for drills
    b) Check marks for scribed lines
    c) Locating points for scribing tools (e.g. divider)
    d) To measure the distance between drills
8. Which one is the correct order of reaming process?
    a) Drill > CSK > Reamer
    b) Spot Drill > Drill > Core Drill > Reamer
    c) Spot Drill > Drill > CSK > Core Drill > Reamer
    d) Spot Drill > Drill > Reamer
9. What is the correct formulae for Blind Tap if thickness of work piece is H and dia of tap is D?
    a) H + 0.3D + 3
    b) H + 0.3D + 0.7D + 3
    c) H + 0.5D + 5
    d) H + 0.5D + 3
10. At what angle filing should be done?
    a) 20°
    b) 30°
    c) 40°
    d) 50°

Section- B

11. The size of the relief angle α influences the _____ between the relief surface of the cutting wedge and the resulting surface of the work piece.

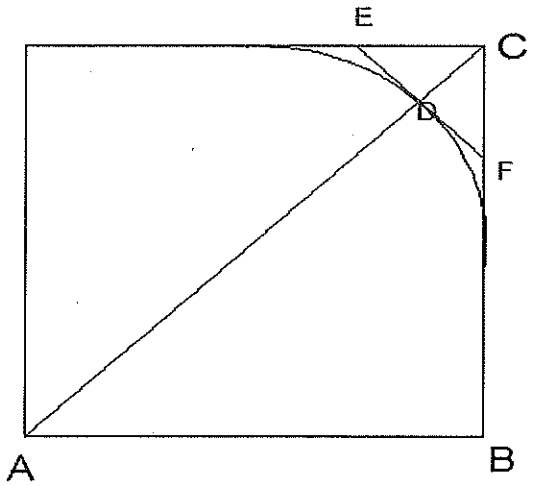


12. The height of the vise is correct when the distance between your elbow and the upper edge of the vise is _____ to _____cm.

13. Why sheet metal is not scribed by hard material?
14. Define the following in one line –
    (1) Drilling
    (2) Reaming
    (3) Tapping
    (4) Deburring
15. Write the difference between counter sinking and counter bore with figure?
16. Write five applications of filing?

Section C

17. Explain the chip formation process.
18. Derive the formulae of chamfer CF = CE for radius 'R', where AB = BC = AD = R.



19. Describe 'free cutting' in 'sawing' with figures? Which types of saw blade can make free cut.

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Course Code: A-POL1001_B
Time (Minutes): 60

Course Name: Handskills
Maximum Marks: 20

Section- A (0.5x10=5 Marks)

1. When the tool wedge will penetrate deeper into the work piece? 0.5 Mark
   Ans. When the work piece material is softer than the tool material
2. A wedge angle β should be always chosen that is – 0.5 Mark
   Ans. As small as possible, but as large as necessary
3. In which process we can't define the cutting-edge geometry? 0.5 Mark
   Ans. Grinding
4. Which one is not the part of chip formation process? 0.5 Mark
   Ans. Tension
5. Which chisel is used in making cavities and slots? 0.5 Mark
   Ans. Web chisel
6. After scribing, base plate is to be used as a base for hammering or layout punching. 0.5 Mark
   Ans. False
7. Layout punch marks are used as – (Multiple choice question) (0.16x3=0.5 Mark)
   Ans.
   1. Start point for drills
   2. Check marks for scribed lines
   3. Locating points for scribing tools (e.g. divider)
8. Which one is the correct order of reaming process? (0.1x5=0.5 Mark)
   Ans. Spot Drill > Drill > CSK > Core Drill > Reamer
9. What is the correct formulae of tap depth for Blind Tap if thickness of work piece is H and dia. of tap is D?
   Ans. H + 0.5D + 3 (0.16x3=0.5 Mark)
10. At what angle filing should be done? (0.5 Mark)
    Ans. 20°

Answer Key

Section- B (1x6=6 Marks)

11. The size of the relief angle α influences the _____between the relief surface of the cutting wedge and the resulting surface of the work piece. (1 Mark)

Ans. Friction

12. The height of the vise is correct when the distance between your elbow and the upper edge of the vise is _____to _____cm. (0.5x2=1 Mark)

Ans. 5, 10

13. Why bend edges on sheet metal is not scribed by hard material? (1 Mark)

Ans. When a sheet metal is scribed by a hard material then a v-notch of very small size is formed, and when it is bent then the scribed sheet metal would break along the scribed line.

14. Define the following in one line – (0.33x3=1 Mark)

Ans.

(1) Drilling – Drilling is the operation of producing circular hole in the work piece by using a rotating cutter called Drill.

(2) Reaming – Reaming is accurate way of sizing and finishing the pre-existing hole, Accuracy of 5 micron can be achieved.

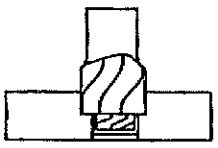
(3) Tapping – Tapping is the process by which internal threads are formed, it is performed by hand or machines.

15. Write the difference between counter sink and counter bore with figure? (0.5x2=1 Mark)

Ans.

Counter Sink – Special angle cone shaped enlargement at the end of the hole to accommodate the screws. Cone angles of 60° , 90° , 120° etc.

Counter Bore – This operation uses a pilot to guide the cutting action to accommodate the heads of bolts.



Counter Boring

Countersinking

16. Write five the applications of filing? (02x5=1 Mark)

Ans. Filing is specially well suited for the production of –

(1) Flat surfaces

(2) Square and parallel surfaces

(3) Radii

(4) Fits

(5) Complex contours

Section C (3x3=9 Marks)

17. Explain the chip formation process. (What and its phases) (1x3=3 Marks)

Ans. In a metal removal process, excess metal is removed in the form of 'chips'. Chip formation can be divided into three phases –

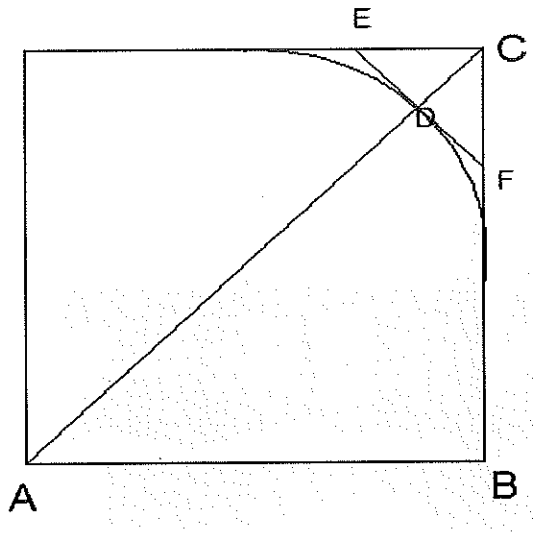
(1) Compression – When a tool comes in contact with the work piece, the work piece material compressed at a certain limit.

(2) Shearing –This compressed material wants to be free so a relative motion will come there between the compressed material and rest of work piece material. Due to this, two parallel forces in opposite direction get started working. These two forces are shear force and the process is shearing.

(3) Sliding – Moving out of the chips from the work piece after cut.

18. Derive the formulae of chamfer CF = CE for radius 'R', where AB = BC = AD = R. (3 Marks)

Ans. The chamfer value for the radius R is CF (=CE)



As given in question: AB = BC = AD = R

So, in triangle ABC, angle C and A is of 45°

$AC^2 = AB^2 + BC^2 = R^2 + R^2 = 2R^2$

$AC = R\sqrt{2} = R \times 1.414 = 1.414R$

$AC = AD + CD \rightarrow CD = AC - AD \rightarrow CD = 1.414R - R = 0.414R$

In triangle FDC –

Angle D is of 90°, C is of 45°, so angle F is also of 45°

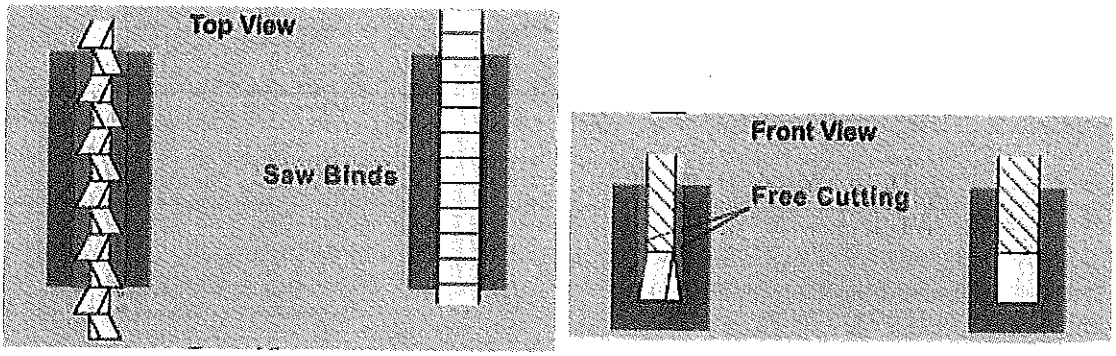
Then, $CF^2 = FD^2 + CD^2 \rightarrow (0.414R)^2 + (0.414R)^2$

$CF = 0.414R\sqrt{2} = 0.414R \times 1.414 = 0.5853R$

$CF \approx 0.6R$

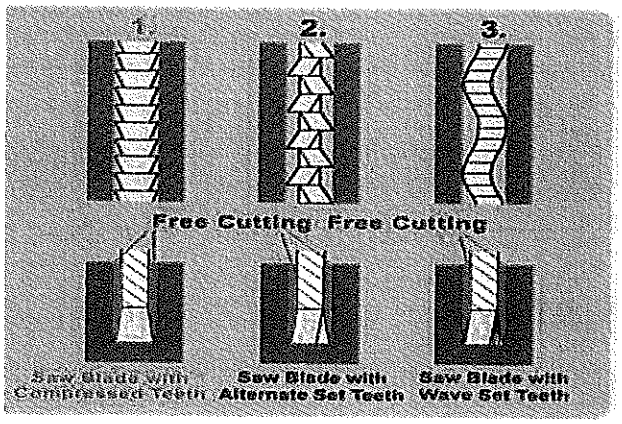
19. Describe 'free cutting' in 'sawing' with figures? Types of saw blade can be made to cut free. (3 Marks)

Ans. During sawing, if the saw blade cuts the work piece material without binding then the cutting is called free cutting. For free cutting the 'kerf' must be wider than the thickness of the blade, if this is not the case the saw blade will bind.



Three types of saw blade can be made to free cut –

(1) Compression of the teeth
(2) Alternation of the teeth
(3) Wave setting of the teeth



lade can be made to cut free.

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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1002_B
Time (Minutes): 60

Course Name: Conv. Milling
Maximum Marks: 20

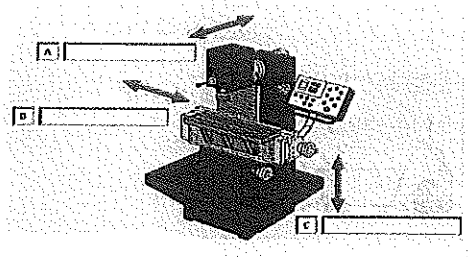
Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

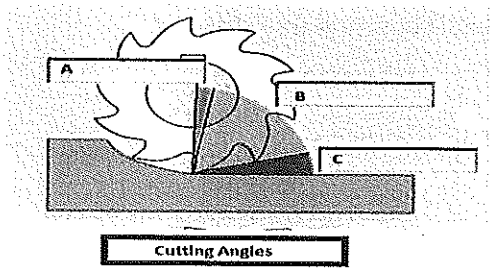
Section- A

1. Rake angle is the angle which is useful for...
    a) Cutting the work peace
    b) Coolant Flow
    c) Chip Removal
    d) Surface Finish
    e) Heat Transfer
2. What is the Normal Clearance angle in Tool...?
    a) 8 -10°
    b) 6-8°
    c) 4-6°
    d) 5-7°
3. During Rough Milling, high Cutting Forces arise. Here axial and radial angle must be...
    a) Positive
    b) Negative
4. What is another name for Up Milling...?
    a) Conventional Milling
    b) Climb Milling

5. What are the types of Milling Process used for position of the cutting edge in use...? **(More than one Option)**
   a) Down Milling
   b) External Milling
   c) Internal Milling
   d) Peripheral Milling
   e) End Milling
   f) Face Milling
   g) Up Milling
6. What is the R.P.M for Edge Finder...?
   a) 100-200
   b) 200-300
   c) 400-600
   d) 1000-1200
7. Please identify the Feed Axis
   a) Transverse
   b) Longitudinal
   c) Vertical



8. Identify various cutting angles in a tool Geometry.
   a) Relief angle α
   b) Wedge angle β
   c) Rake angle Y

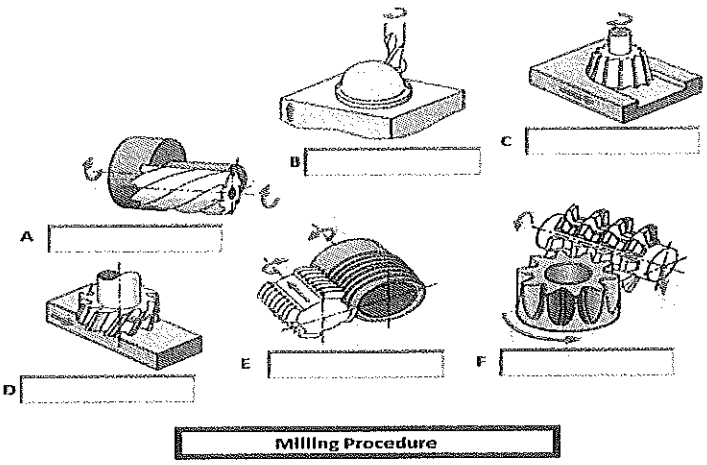


9. Fill in the blanks
   a) Small
   b) Large

		Classification W	Classification H
Number of Teeth	A		
Chip Space	B		
Helix Angle	C		

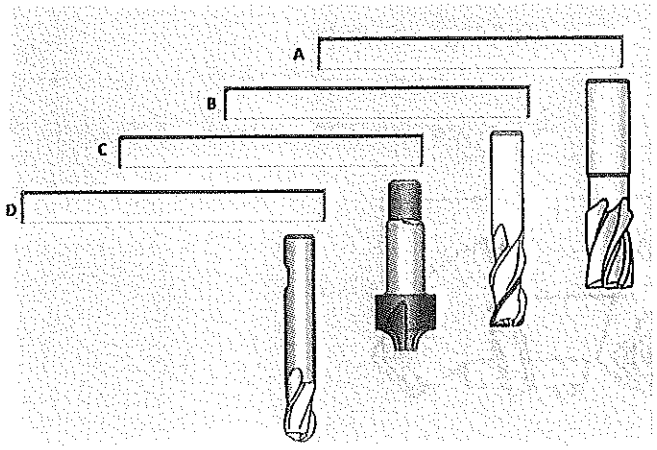
10. Please Match the Milling Procedure shown in the picture

a) Face Milling
b) Circular Milling
c) Helical Milling
d) Hobbing
e) Profile Milling
f) Contour Milling

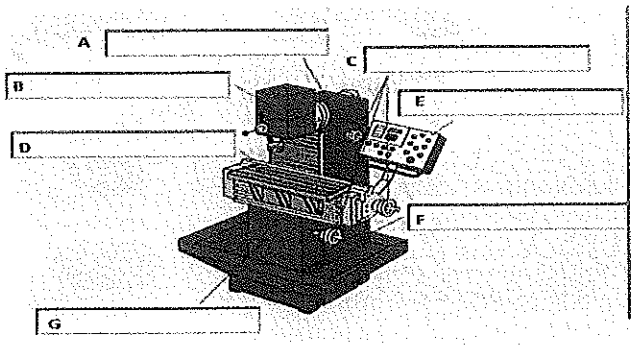


Section- B

11. Write any 2 differences between Up Milling and Down Milling.
12. Name the cutters



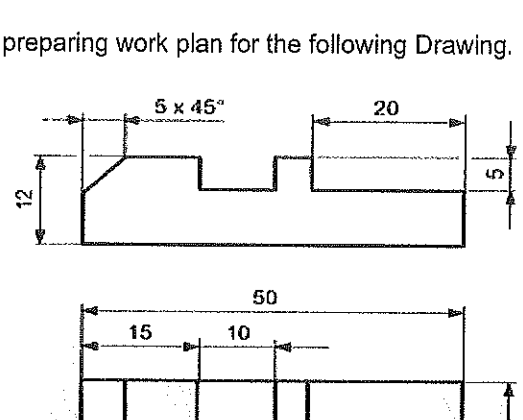
13. Name the following Parts



14. Wedge angle is the angle between _____ and _____.
15. Write any 2 types of Wear?
16. Define Grinding.

Section- C

17. What is Milling? Explain different types of Milling.
18. Describe the Steps to calculate R.P.M for ⌀63 Face mill with V_c= 400 and also calculate its Feed Rate with feed per tooth 0.1.
19. Describe the steps for preparing work plan for the following Drawing.



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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: A-POL1002_B
Time (Minutes): 60

Course Name: Conv. Milling
Maximum Marks: 20

Section- A (0.5x10=5 Marks)

1. Rake angle is the angle which is useful for... 0.5 Mark
   Ans. Chip Removal
2. What is the Normal Clearance angle in Tool...? 0.5 Mark
   Ans. 6°-8°
3. During Rough Milling, high Cutting Forces arise. Here axial and radial angle must be... 0.5 Mark
   Ans. Negative
4. What is another name for Up Milling...? 0.5 Mark
   Ans. Conventional Milling
5. What are the types of Milling Process used for position of the cutting edge in use...? 0.16x3=0.5 Mark
   Ans. Peripheral milling, end milling and face milling
6. What is the R.P.M for Edge Finder...? 0.5 Mark
   Ans. 400-600
7. Please identify the Feed Axis 0.16x3=0.5 Mark
   Ans. A) Transverse
   B) Longitudinal
   C) Vertical
8. Identify various cutting angles in a tool Geometry. 0.16x3=0.5 Mark
   Ans. a) Rake Angle
   b) Wedge Angle
   c) Relief angle
9. Fill in the blanks 0.16x3=0.5 Mark
   Ans. a) Small and Large
   b) Large and Small
   c) Large and Small

Answer Key

10. Please Match the Milling Procedure shown in the picture — 0.5 Mark

Ans. a) Circular Milling
b) Profile Milling
c) Contour Milling
d) Face Milling
e) Helical Milling
f) Hobbing

Section- B — (1x6=6 Marks)

11. Write any 2 differences between Up Milling and Down Milling. — 0.5x2=1 Marks

Ans. Up Milling- Cutter Rotates against direction of feed
It has the tendency to lift the work piece
Down Milling- The cutter rotates with the direction of feed
It has the tendency to dig into the work piece

12. Name the cutters — 0.25x4=1 Marks

Ans. a) Standard Shank Type Milling Cutter
b) Key Way Milling Cutter
c) Corner Rounding End mill
d) Ball End Mill

13. Name the following Parts — 0.14x7=1 Marks

Ans. a) Milling Head
b) Main Drive
c) Hand wheel
d) Machine Table
e) Digital Read Out (D.R.O)
f) Machine Column and Base
g) Knee

14. Wedge angle is the angle between _____ and _____. — 0.5x2=1 Marks

Ans. Face and Tool Flank

15. Write any 2 types of Wear? — 0.5x2=1 Marks

Ans. Flank Wear and Crater Wear

16. Define Grinding. — 1 Marks

Ans. Grinding is a metal removal procedure that produces work piece surface with close tolerance and high surface quality.

Section- C

(3x3=9 Marks)

17. What is Milling? Explain different types of Milling. 1x3=3 Marks

Ans. Milling is a material removal process in which we use geometrically define cutting edges. It advances in X, Y& Z directions with good precision

Types of milling

Conventional milling: - in this process the feed motion runs contrary to the cutting motion of the milling cutter. The cutting edges slides over the work piece surface and cut into the material at the interface with high pressure .it is also known as **up milling.**

Down milling: - in this process the work piece feed motion operates in the same direction as the cutting motion of the milling cutters. the cutting edge cut abruptly into the surface of the work piece and make the largest cut right at the beginning. it is also known as climb milling

18. Describe the Steps to calculate R.P.M for ⌀63 Face mill with V_c= 400 and also calculate its Feed Rate with feed per tooth 0.1. 1.5x2=3 Marks

Ans. $V_c = \pi DN / 1000$

$400 = 3.14 \times 63 \times N / 1000$

$N = 400 \times 1000 / 3.14 \times 63$

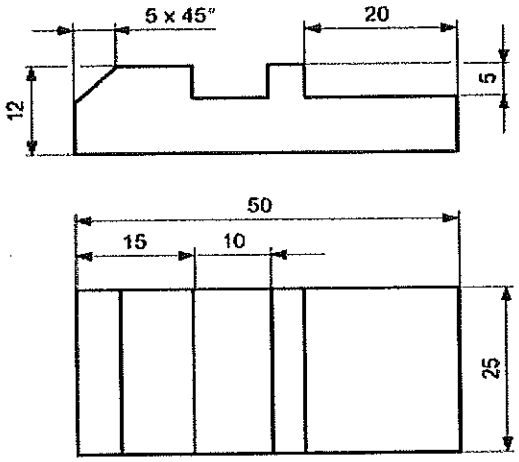
$N = 2022\ min^{-1}$

$F_Z = N \times Z \times f_z$

$= 2022 \times 6 \times 0.1$

$= 1213.2$ m/min.

19. Describe the steps for preparing work plan for the following Drawing. 3 Marks



Answer Key

Ans.

OPERATION WORK PROCESS	TOOL	CUTTING VELOCITY	RPM
Drawing reading and material verification	-------		
Sizing 50 x 25 x 12	Facemill dia 63	400	2000
Step 20 x 5	Shoulder mill dia 63	400	2000
Slot 10 x 5	Slot drill dia 10	80	2200
Chamfer 5 x 45^0	Facemill dia 63	400	2000

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Course Code: POL1003_B
Time (Minutes): 60

Course Name: Assembly
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Marks.
4. Section B contains 06 Questions. Each question carries 1 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A

1. Fastener with a head and straight threaded shank, used with a nut is called-
   a) Screw
   b) Bolt
   c) Stud
   d) Set screw
2. Thin annular shaped metal disk is called-
   a) Nut
   b) Washer
   c) Stud
   d) Bolt
3. When there is heavy thrust load, we use-
   a) Ball Bearing
   b) Roller Bearing
   c) Self-Aligning Bearing
   d) Roller Thrust Bearing
4. When there is no place to accommodate nuts, we use-
   a) Bolt
   b) Stud
   c) Cap screws
   d) Washer

5. Castle nut is also known as-
    a) Locknut
    b) Jam nut
    c) Nut
    d) Slotted nut
6. For a properly lubricated chain, efficiency is from-
    a) 70-80%
    b) 90-92%
    c) 80-90%
    d) 96-98%
7. Belt use for synchronizing cam and crankshaft-
    a) Round belt
    b) Timing belt
    c) Flat belt
    d) V-belt
8. When correctly tensioned, these belts have no slippage-
    a) Round belt
    b) Flat belt
    c) Timing belt
    d) V-belt
9. Teeth are parallel to axis in-
    a) Helical gear
    b) Spur gear
    c) Bevel gear
    d) Herringbone gear
10. When there is some misalignment between axis of shaft and housing, we use-
    a) Ball bearing
    b) Roller bearing
    c) Self-aligning bearing
    d) Deep groove ball bearing

Section- B

11. Grease is a semisolid substance composed of _____ and _____.
12. Define Oil Seal.
13. Non-metallic gaskets are made up of _____, _____, _____ or _____.

14. Define Studs.

15. _____ can be used instead of key to prevent relative motion between the hub and shaft in small power transmissions.

16. V-belts have a _____ cross section.

Section- C

17. Explain any three advantages of flat belts over v-belts.
18. Discuss any three types of keys.
19. Explain three functions of bearing.

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Course Code: A-POL1003_B
Time (Minutes): 60

Course Name: Assembly
Maximum Marks: 20

Section- A (0.5x10=5 Marks)

1. Fastener with a head and straight threaded shank, used with a nut is called- 0.5 Mark
   Ans. Bolt
2. Thin annular shaped metal disk is called- 0.5 Mark
   Ans. Washer
3. When there is heavy thrust load, we use- 0.5 Mark
   Ans. Roller Thrust Bearing
4. When there is no place to accommodate nuts, we use- 0.5 Mark
   Ans. Cap Screws
5. Castle nut is also known as- 0.5 Mark
   Ans. Jam Nut
6. For a properly lubricated chain, efficiency is from- 0.5 Mark
   Ans. 96-98%
7. Belt use for synchronizing cam and crankshaft- 0.5 Mark
   Ans. Timing Belt
8. When correctly tensioned, these belts have no slippage- 0.5 Mark
   Ans. Timing Belt
9. Teeth are parallel to axis in- 0.5 Mark
   Ans. Spur Gear
10. When there is some misalignment between axis of shaft and housing, we use- 0.5 Mark
    Ans. Self- Aligning Bearing

Section- B (1x6=6 Marks)

11. Grease is a semisolid substance composed of _____ and _____. 0.5x2= 1 Mark

    Ans. Grease is a semisolid substance composed of mineral oil and Soap.

Answer Key

12. Define Oil Seal. 1 Mark

Ans. Oil Seal is a mechanical device which is used to prevent leakage of fluid between two machine components.

13. Non-metallic gaskets are made up of _____, _____, _____ or _____. 0.25x4= 1 Mark

Ans. Non-metallic gaskets are made up of asbestos, cork, rubber or plastic.

14. Define Studs. 1 Mark

Ans. A stud is cylindrical rod threaded at both ends. One end is screwed into the tapped hole in one of the connecting parts. The other end receives a nut.

15. _____ can be used instead of key to prevent relative motion between the hub and shaft in small power transmissions. 1 Mark

Ans. Set screw can be used instead of key to prevent relative motion between the hub and shaft in small power transmissions.

16. V-belts have a _____ cross section. 1 Mark

Ans. V-belts have a trapezoidal cross section.

Section- C (3x3=9 Marks)

17. Explain any three advantages of flat belts over v-belts. 1x3=3 Marks

Ans. Advantages

a) Relatively cheap.
b) More efficient.
c) Can be used in dusty and abrasive environment.
d) Design is simple and inexpensive.
e) These can be used for longer distances, up to 15m

18. Discuss any three types of keys. 1x3=3 Marks

Ans. Types of keys.

a) A *parallel key* is the sunk key which is uniform in width as well as height throughout the length of the key.
b) *A taper key* is uniform in width but tapered in height. Taper keys are often provided with Gib-head to facilitate removal.
c) A saddle key is a key which fits in the keyway of the hub only. The power is transmitted by means of friction. Therefore, these keys are suitable for low power transmission as compared to sunk key.
d) Feather Key - A parallel key which is either fixed to the shaft or to the hub and which permits relative axial movement between them Elevators.

19. Explain three functions of bearing. 1x3=3 Marks

Ans. Functions of bearing.

a) It allows relative motion between two parts such as shaft and housing with minimum friction.

b) Supports shaft or axle and holds it in correct position.

c) Support the load.

1) Radial Load

2) Axial Load

3) Angular Load

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SCHOOL OF POLYMECHANIC SKILLS
1st SEMESTER, 2nd IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1004_B
Time (Minutes): 60

Course Name: Measuring
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A

1. Visual and tactile inspection is a type of?
    a) Subjective measurement.
    b) Sensory measurement.
    c) Both subjective and sensory.
    d) None of the above.
2. What is the use of Ratchet...?
    a) Fine movement.
    b) To limit the measuring force.
    c) Both fine movement and two limit the measuring force.
    d) None of these.
3. In what process, we get the numerical value...
    a) Measuring.
    b) Gauging.
    c) Subjective.
4. Which one is the correct measuring tool to measure the diameter of a shaft ...?
    a) Vernier Callipers.
    b) Micrometer.
    c) Snap Gauge.
    d) Plug Gauge.

5. Accuracy of a standards to calibrate a measuring instrument should be...
    a) 1/10th of least count of measuring instrument.
    b) Less than 1/10th of least count of measuring instrument.
    c) More than 1/10th of least count of measuring instrument.
    d) Maximum 1/10th of least count of measuring instrument.
6. Radius gauge is type of....
    a) Form gauge.
    b) Limit gauge.
    c) Dimensional gauge.
    d) Both form and limit gauge
7. Sensory inspection is a type of?
    a) Subjective measurement.
    b) Objective measurement.
8. 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.
9. Convert
    a) 1 cm^2 = ___mm^2
    b) 190µm = ___mm
10. Which of the following is the correct measuring tool to check the dimension (dia) of hole?
    a) Vernier caliper
    b) Ring gauge
    c) Plug gauge
    d) Snap gauge

Section- B

11. Write down the two application of Vernier calipers
12. Define least count.
13. Define repeatability?
14. The process to find out the error in a measuring instrument is called _____.
15. Write down at least two points to decide to select the formula to calculate the least count of measuring tool. Formula is L.C = MSD – VSD?
16. When measured value is close to true value we call it_____

Section- C

17. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.
18. Write down the steps to calibrate 25-50mm micrometer?
19. With the use of the measuring instrument having digital display, Write at least five advantages.

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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: A-POL1004_B
Time (Minutes): 60

Course Name: Measuring
Maximum Marks: 20

Section- A (0.5x10=5 Marks)

1. Visual and tactile inspection is a type of? 0.5 Mark
   Ans. Both subjective and sensory.
2. What is the use of Ratchet...? 0.5 Mark
   Ans. Both fine movement and two limit the measuring force.
3. In what process, we get the numerical value... 0.5 Mark
   Ans. Measuring
4. Which one is the correct measuring tool to Measure the diameter of a shaft 0.5 Mark
   Ans. Micrometer
5. Accuracy of a standards to calibrate a measuring instrument should be... 0.5 Mark
   Ans. More than1/10th of least count of measuring instrument.
6. Radius gauge is type of.... 0.5 Mark
   Ans. Form gauge.
7. Sensory inspection is a type of? 0.5 Mark
   Ans. Subjective measurement.
8. Material of a measuring tool should be... 0.5 Mark
   Ans. Harder than the work piece.
9. Convert 0.25x2=0.5 Mark
   Ans. 10^{-4} mm^2
   Ans. 0.19 mm
10. Which of the following is the correct measuring tool to check the dimension (Ø) of hole? 0.5 Mark
    Ans. Plug gauge

Section- B (1x6=6 Marks)

11. Write down the two application of Vernier calipers. 0.5x2=1 Mark
    Ans.
    a) External measurement.
    b) Internal measurement
12. Define least count. 1 Mark
    Ans. The minimum value that can be measured with measuring instrument is called least count.

Answer Key

13. Write the type of cross-section views? 0.5x2=1 Mark

a) Half-section view.

b) Full-section view.

14. The process to find out the error in a measuring instrument is called _____. 1 Mark

Ans. Calibration

15. Write down at least two points to decide to select the formula to calculate the least count of measuring tool. Formula is L.C = MSD – VSD? 0.5x2=1 Mark

Ans.

i) Both main scale and secondary scale should be similar.

ii) MSD should be greater than VSD

16. When measured value is close to true value we call it_____ 1 Mark

Ans. Accuracy

Section- C (3x3=9 Marks)

17. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula? 3 Marks

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

18. Write any 5 precautions for the use of slip gauge? 0.6x5=3 Marks

i) Take it out only those gauges which is necessary.

ii) It should not fall even on the soft flor.

iii) Clean the measuring faces before using it.

iv) Use minimum block to make the dimension.

Apply Vaseline after using them.

19. With the use of the measuring instrument having digital display, Write at least five advantages.

Ans. 0.6x5=3 Marks

i) Easy to read.

ii) No skill required.

iii) No parallax error.

iv) Can be used as gauge

v) Reduce the measurement time

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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: A-POL1004_B
Time (Minutes): 60

Course Name: Measuring
Maximum Marks: 20

Section- A

(0.5x10=5 Marks)

1. Visual and tactile inspection is a type of? 0.5 Mark
   Ans. Both subjective and sensory.
2. What is the use of Ratchet...? 0.5 Mark
   Ans. Both fine movement and two limit the measuring force.
3. In what process, we get the numerical value... 0.5 Mark
   Ans. Measuring
4. Which one is the correct measuring tool to Measure the diameter of a shaft 0.5 Mark
   Ans. Micrometer
5. Accuracy of a standards to calibrate a measuring instrument should be... 0.5 Mark
   Ans. More than1/10^{th} of least count of measuring instrument.
6. Radius gauge is type of.... 0.5 Mark
   Ans. Form gauge.
7. Sensory inspection is a type of? 0.5 Mark
   Ans. Subjective measurement.
8. Material of a measuring tool should be... 0.5 Mark
   Ans. Harder than the work piece.
9. Convert 0.25x2=0.5 Mark
   Ans. 10^{-4} mm^2
   Ans. 0.19 mm
10. Which of the following is the correct measuring tool to check the dimension (Ø) of hole? 0.5 Mark
    Ans. Plug gauge

Section- B

(1x6=6 Marks)

11. Write down the two application of Vernier calipers. 0.5x2=1 Mark
    Ans.
    a) External measurement.
    b) Internal measurement

Answer Key

12. Define least count. 1 Mark

Ans. The minimum value that can be measured with measuring instrument is called least count.

13. Define repeatability? 1 Mark

Ans. It is the closeness of agreement between repeated measurement of the same thing carried out in the same place by the same person on same equipment in same way at similar time.

14. The process to find out the error in a measuring instrument is called _____. 1 Mark

Ans. Calibration

15. Write down at least two points to decide to select the formula to calculate the least count of measuring tool.

Formula is L.C = MSD – VSD? 0.5x2=1 Mark

Ans.

i) Both main scale and secondary scale should be similar.

ii) MSD should be greater than VSD

16. When measured value is close to true value we call it_____ 1 Mark

Ans. Accuracy

Section- C (3x3=9 Marks)

17. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula? 3 Marks

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

18. Write down the steps to calibrate 25-50mm micrometer? 0.6x5=3 Marks

Ans.

- Clean measuring and reference face of the micrometer.
- Take any standard which should be more accurate than the micrometer. (for exam slip gauge or standard specimen of 25mm or more than that)
- Clean the standard.
- Measure the standard's dimension.
- Reading of micrometer should be equal to the dimension of the standard.

19. With the use of the measuring instrument having digital display, Write at least five advantages.

Ans. 0.6x5=3 Marks

i) Easy to read.

ii) No skill required.

iii) No parallax error.

iv) Can be used as gauge

v) Reduce the measurement time

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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1005_B
Time (Minutes): 60

Course Name: Conv. Turning
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A

1. Tool life is influenced by... **(More than one Option)**
   a) Cutting Condition
   b) Tool itself
   c) Work piece
   d) Coolant lubricant used
2. Cooling lubricant are used to
   a) Increase tool life
   b) Centre the tool
   c) To increase friction for proper cutting
   d) None of above
3. We use large wedge angle when machining.
   a) Hard material
   b) Ductile material
   c) Brittle material
   d) None of these
4. Tear chips are formed when
   a) Using large DOC, low cutting speed and large feed rate
   b) Using large DOC, large cutting speed and small feed rate
   c) Using small DOC, large cutting speed and large feed rate
   d) Using small DOC, small cutting speed and small feed rate

5. Continuous chips are formed when applied
    a) High cutting speed with large rake angle.
    b) Low cutting speed with large rake angle.
    c) High cutting speed with low rake angle.
    d) Low cutting speed with high rake angle.
6. Surface of turned components depends on. **(More than one Option)**
    a) Rounding of all corners
    b) Cutting speed
    c) Feed of lathe tool
    d) All of above
7. Does cooling lubricant have chemically inert properties.
    a) True.
    b) False.
8. We make spigot on work piece to prevent
    a) Slipping in
    b) Friction
    c) Wear
    d) Bending
9. What should we add in composition of material to avoid continuous chips?
    a) Chromium
    b) Nickel
    c) Manganese
    d) Sulphur
10. Which type of chips gives best surface finish?
    a) Shear chips
    b) Tear chips
    c) Continuous chips
    d) None of these

Section- B

11. Write the formula for minimum depth of cut.
12. Write the formula for maximum feed rate.
13. Which angle mainly influences chip formation?
14. Name the type of thread used in lead screw?
15. In a 3 start thread if pitch is 1.5 then lead should be _____.
16. The peak to valley distance between the highest and lowest point on the surface being examined is known as _____.

Section- C

17. Explain appropriate reason for centering of turning tool before machining? (with the help of sketch)?
18. Explain Toughness, Hardness, Brittleness, Ductility & density of material.
19. For M12x1.5 thread, calculate the following: -

    a) Thread depth.
    b) V depth.
    c) Major diameter.
    d) Minor diameter.
    e) Chamfer

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SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: A-POL1005_B
Course Name: Conv. Turning
Time (Minutes): 60
Maximum Marks: 20

Section- A (0.5x10=5 Marks)

1. Tool life is influenced by... 0.5 Mark
   Ans. All are correct.
2. Cooling lubricant are used to 0.5 Mark
   Ans. Increase tool life.
3. We use large wedge angle when machining. 0.5 Mark
   Ans. Hard material.
4. Tear chips are formed when 0.5 Mark
   Ans. Using large depth of cut, low cutting speed and large feed rate.
5. Continuous chips are formed when applied 0.5 Mark
   Ans. High cutting speed with large rake angle.
6. Surface of turned components depends on. 0.5 Mark
   Ans. All of above.
7. Does cooling lubricant have chemically inert properties. 0.5 Mark
   Ans. True.
8. We make spigot on work piece to prevent 0.5 Mark
   Ans. Slipping in.
9. What should we add in composition of material to avoid continuous chips? 0.5 Mark
   Ans. Sulphur.
10. Which type of chips gives best surface finish? 0.5 Mark
    Ans. Continuous Chips.

Section- B (1x6=6 Marks)

11. Write the formula for minimum depth of cut. 1 Mark
    Ans. 2/3rd of nose radius of tool.
12. Write the formula for maximum feed rate. 1 Mark
    Ans. ½ of nose radius of tool.
13. Which angle mainly influences chip formation? 1 Mark
    Ans. Rake angle.
14. Name the type of thread used in lead screw? 1 Mark
    Ans. Acme thread.

Answer Key

15. In a 3 start thread if pitch is 1.5 then lead should be ____ 1 Mark

Ans. 4.5

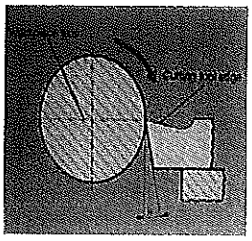
16. The peak to valley distance between the highest and lowest point on the surface being examined is known as ____ 1 Mark

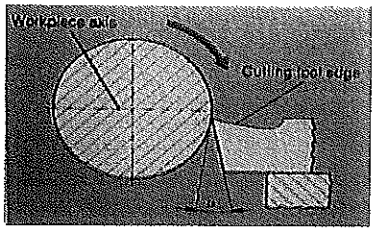
Ans. Rt.

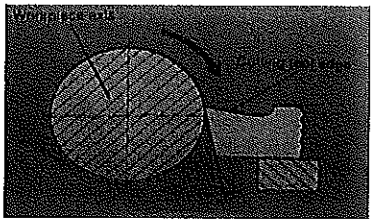
Section- C **(3x3=9 Marks)**

17. Explain appropriate reason for centering of turning tool before machining? 3 Marks

Ans.







If tool is above Centre then clearance angle increases which in result increase tool friction due to which heat is generated and tool can melt.

If tool is below Centre, then rake angle decreases and clearance angle decreases which in result increase the impact force on the tool by which toll can break.

That's why centering of tool is very important before machining to maintain high accuracy with low accident risk.

18. Explain Toughness, Hardness, Brittleness, Ductility & density of material. 0.6x5=3 Marks

Ans. **Toughness**: - Ability of material to absorb energy and plastically deform without fracturing or amount of energy per unit volume that material can absorb before rupturing.

Hardness: - Resistance of material to deformation, indentation or penetration.

Ductility: - Solid materials ability to deform under tensile stress often characterized by materials ability to stretch into wire.

Brittleness: - Material when subjected to stress, it breaks without significant deformation.

Density of material: - It is mass per unit volume of material.

19. For M12x1.5 thread, calculate the following: - 0.6x5=3 Marks

    a) Thread depth.
    b) V depth.
    c) Major diameter.
    d) Minor diameter.
    e) Chamfer.

Ans. a): - Thread depth: - 0.614xpitch= 0.614x1.75= 1.0745mm

1.0745x2=2.15mm. (Diametrically)

b): - V depth: - 0.866xpitch= 0.866x1.75=1.515mmm

c): - Major diameter: -Nominal dia.- 10%of pitch= 12 - 0.17= 11.83mm

d): - Minor diameter: -Major dia. – thread depth = 11.83 – 2.15= 9.68mm

e): - Chamfer: - {(Major dia. – Minor dia.)/2} + 0.5 = 1.5745mm.

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1st SEMESTER, 2nd IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1006_B
Time (Minutes): 60

Course Name: Pneumatics
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A

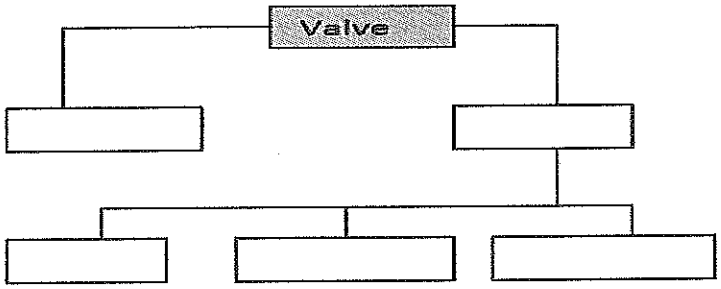
1. The Fluid use to transmit power in Pneumatics is-
    a) Air
    b) Water
    c) Oil
    d) Liquid
2. A hydraulic system operates at a pressure up to-
    a) 10-12 bar
    b) 7-8 bar
    c) 400 bar
    d) 700 bar
3. Fluid power system is based on-
    a) Bernoulli's principle
    b) Gas law
    c) Avogadro's law
    d) Pascal law
4. The Function of Tank is to-
    a) maintain a pressure range
    b) drain water content
    c) prevents from pressure fluctuation
    d) remove dust particles from air

5. When PV=Constant, if we increase the volume then pressure will-
    a) Remains constant
    b) Decrease
    c) Increase
    d) none of these
6. In Isochoric process, at constant volume-
    a) Pressure is directly proportional to temperature
    b) Pressure is inversely proportional to temperature
    c) Temperature is proportional to volume
    d) Volume is directly proportional to pressure
7. Which compressor is used as portable compressor?
    a) Diaphragm compressor
    b) Single stage piston compressor
    c) Screw compressor
    d) Vane compressor
8. What type of Refrigerant we are using in our Dryer?
    a) R22
    b) R34a
    c) R134a
    d) R34
9. What is L in FRL unit-
    a) Lubricant
    b) Liquid
    c) Lubricator
    d) Lubrication
10. OR element is also known as-
    a) Dual pressure valve
    b) Shuttle valve
    c) Flow control valve
    d) Memory valve

Section- B

11. Vane type actuators have the angle of rotation of _____, _____ and _____.
12. Which double acting cylinder is used where space is constraint.
13. Draw the symbol of Single acting and Double acting cylinder.
14. Define Compressor.
15. In poppet valves, the flow is controlled by _____or _____ lifting.

16. Fill in the blanks:



Section- C

17. Explain Bernoulli's principle. Also write the equation.
18. Differentiate between Pneumatics & Hydraulics.
19. A 20mm diameter piston is lifting 30kg block of material. If the piston lifts 3 blocks of material at once. Then calculate the required pressure in bar.

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SESSION 2017-2018

Course Code: A-POL1606_B
Course Name: Pneumatics
Time (Minutes): 60
Maximum Marks: 20

Section- A

(0.5x10=5 Marks)

1. The Fluid use to transmit power in Pneumatics is- 0.5 Mark
   Ans. Air 0.5 Mark
2. A hydraulic system operates at a pressure up to-
   Ans. 700 bar 0.5 Mark
3. Fluid power system is based on-
   Ans. Pascal law 0.5 Mark
4. The Function of Tank is to-
   Ans. prevents from pressure fluctuation 0.5 Mark
5. When PV=Constant, if we increase the volume then pressure will-
   Ans. Decrease 0.5 Mark
6. In Isochoric process, at constant volume-
   Ans. Pressure is directly proportional to temperature 0.5 Mark
7. Which compressor is used as portable compressor?
   Ans. Diaphragm compressor 0.5 Mark
8. What type of Refrigerant we are using in our Dryer?
   Ans. R134a 0.5 Mark
9. What is L in FRL unit-
   Ans. Lubricator 0.5 Mark
10. OR element is also known as-
    Ans. Shuttle valve

Section- B

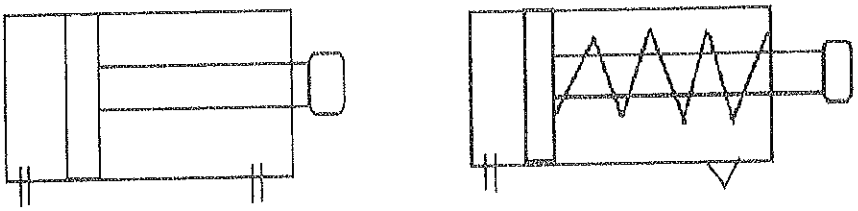
(1x6=6 Marks)

11. Vane type actuators have the angle of rotation of _____, _____ and _____. 0.33x3=1 Mark
    Ans. 90°, 180° and 270° 1 Mark
12. Which double acting cylinder is used where space is constraint.
    Ans. Telescope

Answer Key

13. Draw the symbol of Single acting and Double acting cylinder. 1 Mark

Ans.



14. Define Compressor. 1 Mark

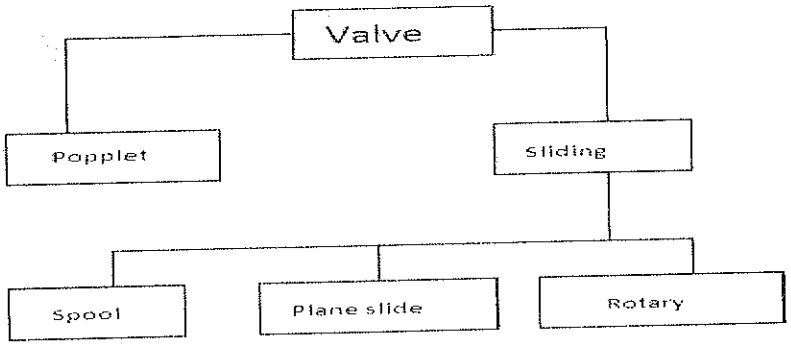
Ans. A compressor is a mechanical device that increases the pressure of a gas by reducing its volume. It converts power (using an electric motor, diesel engine, etc.) into potential energy stored in pressurized air.

15. In poppet valves, the flow is controlled by _____ or _____ lifting. 0.5x2=1 Mark

Ans. Disc or Plug

16. Fill in the blanks: 1 Mark

Ans.



Section- C

(3x3=9 Marks)

17. Explain Bernoulli's principle. Also write the equation. 1.5x2=3 Marks

Ans. Bernoulli's principle states that an increase in the speed of a fluid occurs simultaneously with a decrease in pressure or a decrease in the fluid's Potential Energy.

$$P_1 + \frac{1}{2}\rho V_1^2 + \rho g h_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho g h_2$$

18. Differentiate between Pneumatics & Hydraulics. 0.6x5=3 Marks

Ans.

S. No.	Hydraulic System	Pneumatic System
1.	It uses a pressurized liquid as a fluid	It uses compressed gas, usually air, as a fluid
2.	An oil hydraulic system operates at pressure up to 700 bar	A pneumatic system usually operates at 10–12 bar
3.	Generally designed as closed system	Usually designed as open system
4	Valve operations are difficult	Valve operations are easy
5	Heavier in weight	Lighter in weight
6	Pumps are used to provide pressurized liquids	Compressors are used to provide compressed gases
7	The system has fire hazards	The system is free from fire hazards
8	Automatic lubrication is provided	Special arrangements for lubrication

19. A 20mm diameter piston is lifting 30kg block of material. If the piston lifts 3 blocks of material at once. Then calculate the required pressure in bar. 3 Marks

Ans. $P = F/A$, $F = (30*3) *9.81$

$= 882.90$ N

$A = \pi/4*d^2$

$=\pi/4*(0.02)^2$

$=3.14*10^{-4}$

$P= 882.90 / 3.14*10^{-4}$

$P= 28.11$ bar

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1st SEMESTER, 2nd IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: POL1007_B
Course Name: Welding
Time (Minutes): 60
Maximum Marks: 20

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 0.5 Mark.
4. Section B contains 06 Questions. Each question carries 1 Mark.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A

1. What Is the most required thing in welding?
    a) Current
    b) Pressure
    c) Heat
    d) Electrode
2. What is the code for TIG Welding?
    a) 111
    b) 142
    c) 121
    d) 141
3. Tensile strength of electrode E6013 is...
    a) 430 MPa
    b) 470 MPa
    c) 520 MPa
    d) 490 MPa
4. What type of coating is found on electrode E7018?
    a) High Titania sodium
    b) High Titania potassium
    c) Low hydrogen sodium
    d) Low hydrogen potassium

5. The gap between the electrode and the work piece should be about?
    a) Electrode Diameter
    b) Core wire Diameter
    c) Electrode Diameter X 2
    d) Core wire Diameter X 1.5
6. What type of current does a welding transformer supply...?
    a) DC
    b) AC
    c) Both
7. MIG welding is always performed on .....current.
    a) DCSP
    b) AC
    c) DCRP
8. Wire feeding system is used for .....
    a) Control the gas supply
    b) Adjust the voltage
    c) control the wire speed
    d) control the welding speed
9. Electrode used in TIG welding is .....
    a) Consumable
    b) Non- consumable
10. Why must welders use a Welding Helmet
    a) To aid visibility
    b) To protect their eyes when removing slag
    c) To protect their eyes from flashes
    d) To offer protection from radiation

Section- B

11. Classify weld seam inspection procedure and name three process of each.
12. Write the steps for Tack Welding. (only name)
13. Write any three characteristics of electrode covering.
14. What do you mean by welding defect?
15. What is protective gear? Write name of four protective gears used in welding.
16. What is the use of contact tip?

Section- C

17. Describe the designation of Mild steel electrode in MMA. Explain what do you by E 6013 And E 7018.
18. Draw All types of welding position in AWS with their designation.
19. Draw the diagram of TIG welding Torch and explain the function of each part?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY
SCHOOL OF POLYMECHANIC SKILLS
1st SEMESTER, 2nd IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2017-2018

Course Code: A-POL1007_B
Course Name: Welding
Time (Minutes): 60
Maximum Marks: 20

Section- A **(0.5x10=5 Marks)**

1. What Is the most required thing in welding? 0.5 Mark
   Ans. Heat
2. What is the code for TIG Welding? 0.5 Mark
   Ans. 141
3. Tensile strength of electrode E6013 is... 0.5 Mark
   Ans. 430 MPa
4. What type of coating is found on electrode E7018? 0.5 Mark
   Ans. High titania potassium
5. The gap between the electrode and the work piece should be about? 0.5 Mark
   Ans. Core wire Diameter
6. What type of current does a welding transformer supply? 0.5 Mark
   Ans. AC
7. MIG welding is always performed on .....current. 0.5 Mark
   Ans. DCRP
8. Wire feeding system is used for ..... 0.5 Mark
   Ans. control the wire speed
9. Electrode used in TIG welding is ..... 0.5 Mark
   Ans. Consumable
10. Why must welders use a Welding Helmet 0.5 Mark
    Ans. To offer protection from radiation

Section- B **(1x6=6 Marks)**

11. Classify weld seam inspection procedure and name three process of each. 0.5x2=1 Mark
    Ans. Types of Weld Seam inspection:
    A) Destructive
    Bend Test, Break Test, Tensile Test
    B) Non-Destructive
    X Ray Test, Liquid penetration Test, Ultra sonic Test, Magnetic partical test, Visual Inspection, Eddy current Test

Answer Key

12. Write the steps for Tack Welding. (only name) 0.33x3=1 Mark

Ans. Steps are:

a. Aligning
b. Clamping
c. Tack

13. Write any three characteristics of electrode covering. 0.33x3=1 Mark

Ans. Characteristics of electrode covering:

a) Provide a protective atmosphere.
b) Stabilize the arc.
c) Provide a protective slag coating to accumulate impurities, prevent oxidation, and slow the cooling of the weld metal.
d) Reduce spatter.
e) Add alloying elements.
f) Affect arc penetration
g) Influence the shape of the weld bead.
h) Add additional filler metal.

14. What do you mean by welding defect? 1 Mark

Ans. A welding defect is any flaw that compromises the usefulness of a weldment.

15. What is protective gear? Write name of four protective gears used in welding. 0.5x2=1 Mark

Ans. Accessories that are used to protect the person doing any kind of work. Protective gear used in welding:

a. Helmet
b. Gloves
c. Apron
d. Safety shoes
e. Safety glass
f. Ear plug
g. Nose mask (any Four)

16. What is the use of contact tip? 0.5x2=1 Mark

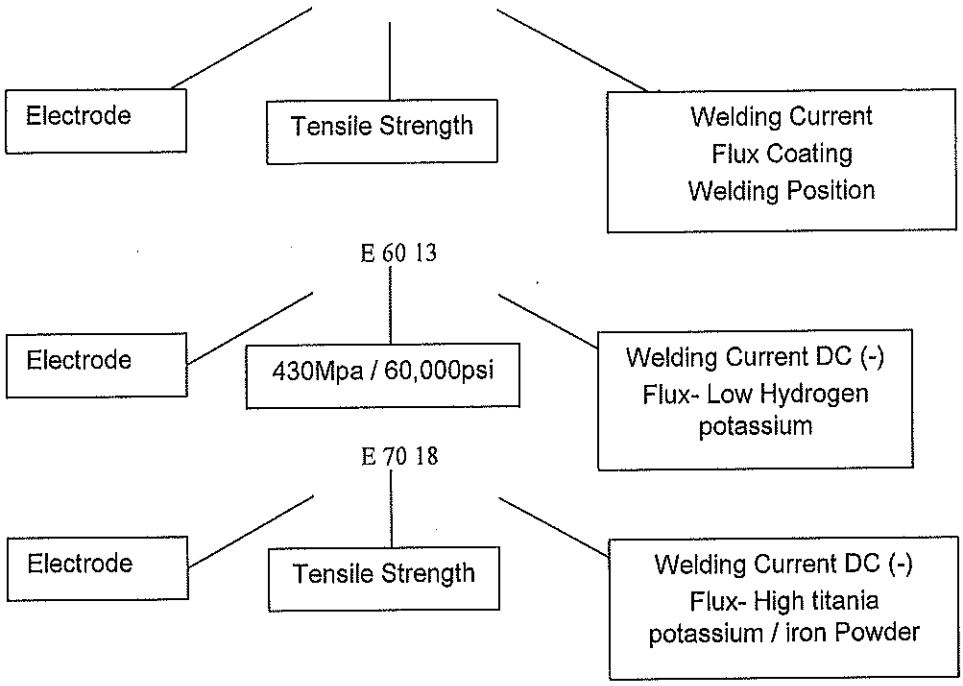
Ans. Uses Are:

a. Supplies the current to electrode wire, &
b. Stabilizes the arc

BSDU

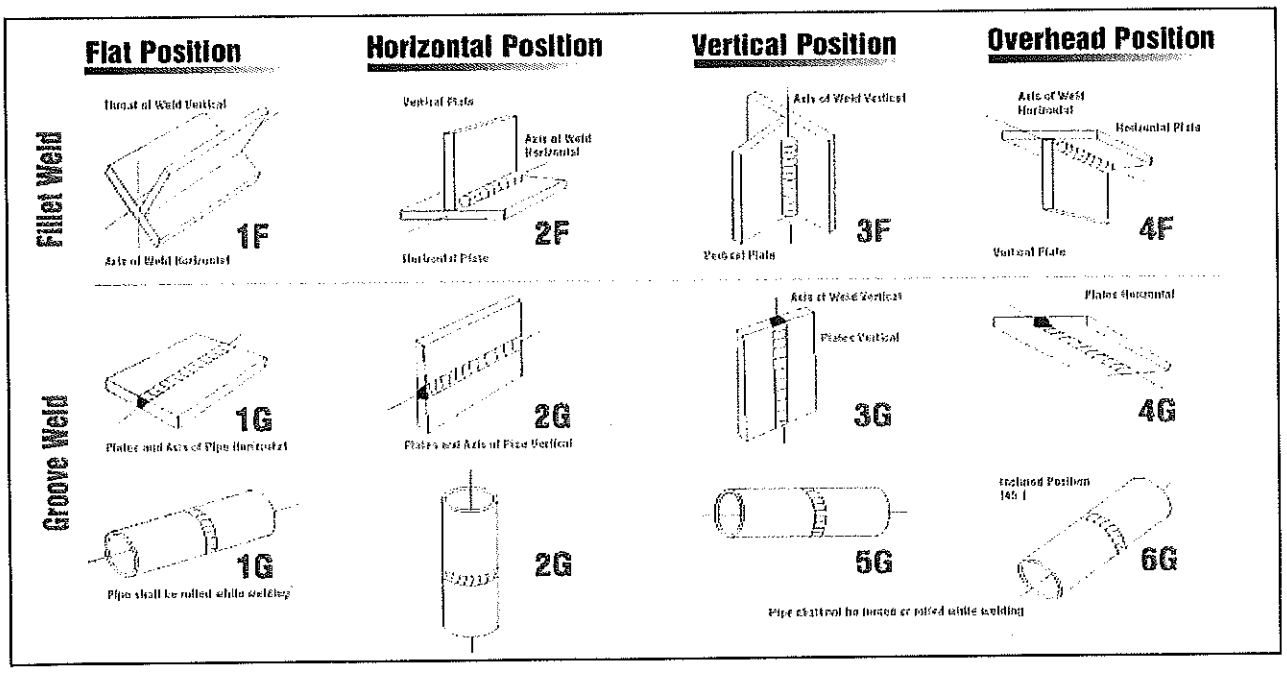
Section- C (3x3=9 Marks)

17. Describe the designation of Mild steel electrode in MMA. Explain what do you by E 6013 And E 7018.
Ans. 3 Marks



18. Draw All types of welding position in AWS with their designation. 3 Marks

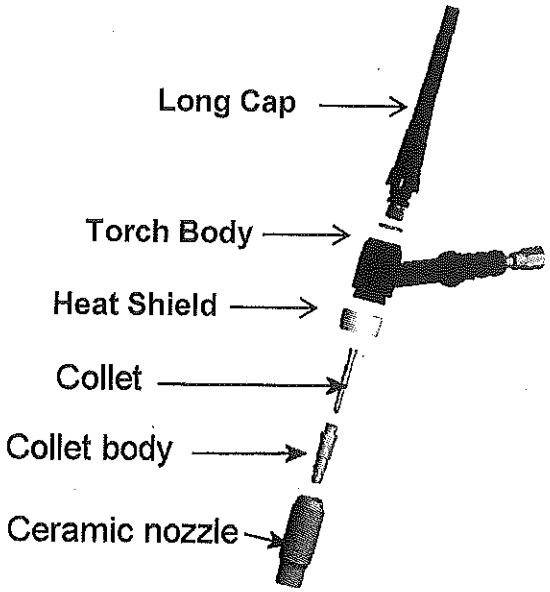
Ans.



Answer Key

19. Draw the diagram of TIG welding Torch and explain the function of each part? 3 Marks

Ans.



LONG CAP support electrode and provides some back pressure to avoid slipping of the tungsten electrode

TORCH BODY is used For handling accessories

HEAT SHIELD prevents torch body from the heat released during welding

COLLET directly hold the tungsten in place when you tighten the back cap and create the electrical contact

COLLET BODY screw into the TIG torch and accommodate various size tungsten and their respective

NOZZLE provides a given amount of shielding gas coverage to the weld pool