BHARTIYA SKILL DEVELOPMENT UNIVERSITY
SCHOOL OF MANUFACTURING SKILLS
3rd SEMESTER, 3rd In-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3002
Course Name: Advanced Hand Skill
Time (Minutes): 60
Maximum Marks: 20 Marks

Instructions:

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

Section-A **(05 x 01 = 05)**

1. What is meant by Hand Skill?
   a) Work with machine
   b) Work without machine
   c) Work only with file
   d) None of the above
2. For 'wood' which type of wedge angle is needed?
   a) Small wedge angle
   b) Medium wedge angle
   c) Large wedge angle
   d) None of the above
3. How many cutting edges does chisel have?
   a) 4
   b) 3
   c) 2
   d) 1
4. What would be the procedure for reaming process?
   a) Drill – core drill – reamer
   b) Spot drill – drill – csk – reamer
   c) Spot drill – drill – csk – core drill – reamer
   d) None of the above

5. What will be the sum of wedge angle, relief angle and rake angle?
   a) Less than 90°
   b) More than 90°
   c) Equal to 90°
   d) None of the above

Section- B **(03 x 02 = 06)**

6. What will happen if the size of relief angle is decreased?
7. Why there should always be a punch before drill?
8. Write the applications of filing.

Section- C **(03 x 03 = 09)**

9. Define the following ;
   a) Drilling **b)** Reaming **c)** Tapping **d)** CSK
10. Write the differences between the 'cut file' and 'milled file'.
11. What occupational safety should be considered during sawing?

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Course Code: SMS3002
Time (Minutes): 60

Course Name: Advanced Hand Skill
Maximum Marks: 20 Marks

Instructions:

1. Attempt all questions.
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5. Section C contains 03 Questions. Each question carries 3 Marks.

Answer – Sheet

Section-A (05 x 01 = 05)

1. What is meant by Hand Skill?

   Ans. (b) Work without machine

2. For 'wood' which type of wedge angle is needed?

   Ans. (a) Small wedge angle

3. How many cutting edges does chisel have?

   Ans. (d) 1

4. What would be the procedure for reaming process?

   Ans. (c) Spot drill – drill – csk – core drill – reamer

5. What will be the sum of wedge angle, relief angle and rake angle?

   Ans. (c) Equal to 90°

Section- B (03 x 02 = 06)

6. What will happen if the size of relief angle is decreased?

   Ans. If the size of the relief angle is decreased then the friction between the tool and the work piece will be more and due to this may be tool become damage and surface quality will be poor.

7. Why there should always be a punch before drill?

   Ans. Punch is used to guide the drill in drilling operation.

8. Write the applications of filing.

Ans. The applications of filing are –

Flat surfaces, square and parallel surfaces, radii, fits, complex contours.

Section- C (03 x 03 = 09)

9. Define the following ;

a) Drilling **b)** Reaming **c)** Tapping **d)** CSK

Ans. a) Drilling – It is a process of making hole onto the work piece.

b) Reaming – It is a process of enlarging a hole with high surface quality and within tolerance of 10 – 20 microns.

c) Tapping – It is a process of making internal thread with a special tool named 'tap'.

d) CSK – It is a process of making chamfer on a hole.

10. Write the differences between the 'cut file' and 'milled file'.

Ans. Differences between cut file and milled file are –

Cut file – cut files are made by chiseling notches into the file face. This results in a file with a negative rake angle and a scraping effect. Therefore cut files are preferred for hard materials.

Milled file – milled files are made by milling the cutting edge into the file face. Files with milled teeth have a positive rake angle, and therefore cut better than cut files. Milled files are especially suited for use on soft materials.

11. What occupational safety should be considered during sawing?

Ans. Occupational safety during sawing –

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

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3rd SEMESTER, 3rd In-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3004
Course Name: Advance Measuring
Time (Minutes): 60
Maximum Marks: 20 Marks

Instructions:

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

Section-A **(5X1=5 Marks)**

1. CMM is an instrument used for:
   a) Dimensional measurement of the engineering parts
   b) Geometrical tolerances of the parts
   c) Both above
   d) None of above
2. Cartesian coordinate system consists of:
   a) Mutually perpendicular 3 axes
   b) Direction of the axes
   c) Origin of the axes
   d) All the above
3. Convert 2.54 km into mm.
   a) $2.5X10^{6}$
   b) $2.5X10^{5}$
   c) $2.5X10^{7}$
   d) $2.5X10^{-4}$
4. Following is not a form of error.
   a) Circularity
   b) Concentricity
   c) Flatness
   d) Cylindricity
5. Concentricity symbol is:

a)

b)

c)

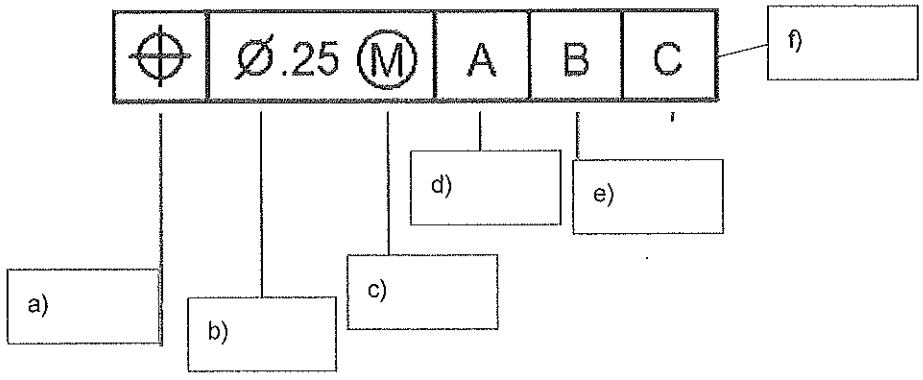
(d) None of the above

Section- B (3X2=6 Marks)

6. Define MMC and LMC with examples.
7. Draw symbols of the following given tolerances;
   a) Cylindricity
   b) Parallelism
   c) Symmetry
   d) Position
8. Define datum.

Section- C (3X3=9 Marks)

9. Fill in the box:



10. State the full form of the following given abbreviations.
    a) OEM
    b) UCC
    c) SPA
11. Define different types of TP20 module and probe head.

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SCHOOL OF POLYMECHANIC SKILLS
3RD SEMESTER, 3RD IN-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3004 **Course Name**: Advance Measuring
Time (Minutes): 60 **Maximum Marks**: 20

Section- A **(1X5=5 Marks)**

1. CMM is an instrument used for:
   Ans. c) Both above
2. Cartesian coordinate system consists of:
   Ans. d) All the above
3. Convert 2.54 km into mm.
   Ans. 25,40,000
4. Following is not a form error.
   Ans. b) Concentricity
5. Concentricity symbol is:
   Ans. a)

Section- B **(2X3=6 Marks)**

6. Define MMC and LMC with example. (1X2=2 Marks)

   Ans. **MMC**, is a feature of size symbol that describes the condition of a feature or part where the maximum amount of material (volume/size) exists within its dimensional tolerance.

   If it is a hole or internal feature: MMC = smallest hole size

   LMC, is a feature of size symbol that describes a dimensional or size condition where the least amount of material (volume/size) exists within its dimensional tolerance.

   If it is a hole or internal feature: LMC =Largest hole size

Answer Key

7. Draw symbol of given tolerances: (0.5x4=2 Marks)

Ans.

a)

b)

c)

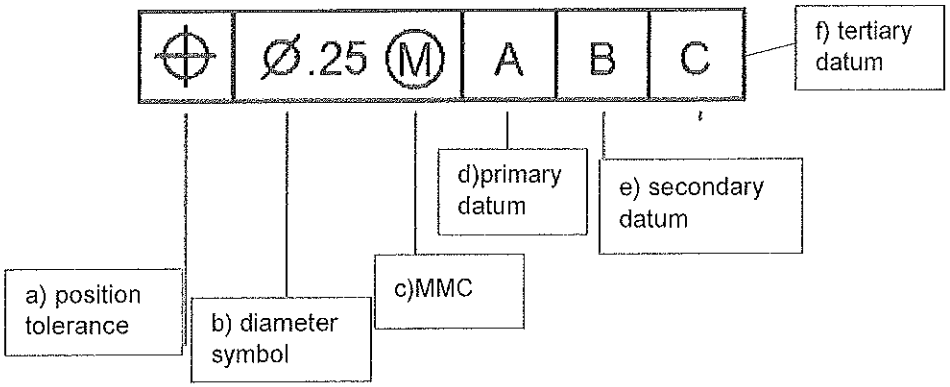
d)

8. Define datum. (2x1=2 Marks)

Ans. A theoretically exact geometric reference (such as planes, straight lines, etc.) to which toleranced features are related.

Section- C (3X3=9 Marks)

9. Fill in the box: (0.5x6=3 Marks)



10. State the full form of given: (1X3=3 Marks)

Ans.

a) OEM-original equipment manufacturer
b) UCC-universal CMM controller
c) SPA-servo power amplifier

11. Define different types of TP20 module and probe head. (0.5x6=3 Marks)

Ans. PROBE HEAD

- Manual head
- Motorized head
- Fixed head

TP20 MODULE

- Light force
- Standard force
- Medium force

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SCHOOL OF MANUFACTURING SKILLS
3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3001
Course Name: Advanced Conv. Manufacturing
Time (Minutes): 90
Maximum Marks: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section-A **(1x10=10 Marks)**

1. Which type of abrasive is used for the structural steel?
   a) Diamond
   b) Boron nitride
   c) Aluminum oxide
   d) Silicon carbide

2. Which one of the types of wears is caused due to fluctuations in temperature?
   a) Edge fractures
   b) Thermal cracks
   c) Edge build -up
   d) Chips & splinters

3. What is the designation for hardness grade range A-D of an abrasive tool?
   a) Soft
   b) Extremely soft
   c) Hard
   d) Very hard

4. RF abbreviation is used for which one of the following bond types?
    a) Vitrified
    b) Resinoid
    c) Metal
    d) Fiber reinforced

5. What is the range of abrasive grainsize number for medium designation in grinding wheel?
    a) 10 to 24
    b) 30 to 60
    c) 70 to 220
    d) Over 220

6. What is coolant concentration percentage for grinding?
    a) 10%
    b) 12%
    c) 5%
    d) 15%

7. What is the Normal Clearance angle in Tool?
    a) 8 -10°
    b) 6-8°
    c) 4-6
    d) 5-7°

8. Which tool is used for making corner radius?
    a) T- slot cutter
    b) Ball nose cutter
    c) Dove tail cutter
    d) Shell end mill cutter

9. What is the R.P.M for slit cutter?
    a) 500-600
    b) 1100-1200
    c) 200-300
    d) 800-1000

10. Type 'H' milling cutters are used to cut materials:
    a) Soft & stringy
    b) Hard & tough

Section- B (4x5=20 Marks)

11. Explain the form of teeth?
12. What is Milling? Explain different types of Milling?
13. Write the name of different types of gear?
14. Explain any four types of tool wear?

Section- C (10x2=20 Marks)

15. Calculate number of teeth to be cut out if gear blank diameter is 156 mm & module of disc cutter is 3mm.
16. Explain different types of milling machines.

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SCHOOL OF MANUFACTURING SKILLS
3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3001 **Course Name**: Conventional Turning
Time (Minutes): 90 **Maximum Marks**: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section-A **(10x1=10 Marks)**

1. Which type of chips will occurred while cutting ductile material?
   a) Continuous chips
   b) Shear Chips
   c) Tear Chips
   d) None of the above
2. Thread angle of buttress thread is……
   a) 29°
   b) 33°
   c) 30°
   d) 60°
3. What is the use of tailstock in turning?
   a) Supporting long shaft
   b) Drilling
   c) A & B Both
   d) Grooving
4. Why do we use coolant?
   a) To increase tool life
   b) To improve the surface finish of the work piece
   c) To reduce the surface temperature of the work piece
   d) All of the above
5. What is the formula for minimum depth of cut?

a) 3/2rd of Nose radius
b) 4/3rd of Nose radius
c) 1/3rd of Nose radius
d) 2/3rd of Nose radius

6. Under which condition tear chips can be formed?
   a) Using a large depth of cut, low cutting speed.
   b) Using a small depth of cut, high cutting speed
   c) Using medium depth of cut high cutting speed
   d) None of the above
7. Which thread is capable to bear heavy load in both directions?
   a) Acme threads
   b) Butters thread
   c) BSW threads
   d) BSP threads
8. Which one is the bilateral tolerance?
   a) 10.0.1
   b) 10±0.1
   c) 10+0.1
   d) All of Above
9. For interrupted turning we take _____ angle of inclination.
   - Positive
   - Negative
10. Chip breakers should produce _____ chip forms.
   - Favorable
   - Unfavorable

Section- B **(04x05= 20 Marks)**

11. Give appropriate reasons for centering of turning tools before machining? (with a sketch)
12. What are the advantages does a negative angle of inclination for the tool holder have?
13. Define different types of thread by their thread cross-section.
14. Define Average roughness value (Ra) and Average maximum height of the profile (Rz). Which value is greater for the same surface roughness?

Section- C **(02x10=20 Marks)**

15. Calculate theoretical surface roughness during turning if corner radius is 0.6 mm and feed rate is 0.4 mm and also define Ra & Rz.
16. Explain at least 5 components of lathe machine.

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3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3001 **Course Name**: Advance Conv. Manufacturing
Time (Minutes): 90 **Maximum Marks**: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section-A **(10x1=10 Marks)**

1. Which type of chips will occurred while cutting ductile material?
   Ans. (A) Continuous chips
2. Thread angle of buttress thread is.....
   Ans. (B) 33°
3. What is the use of tailstock in turning?
   Ans. (C) A & B Both
4. Why do we use coolant?

   Ans. (D) All of the above
5. What is the formula for minimum depth of cut?
   Ans. (D) 2/3rd of Nose radius.
6. Under which condition tear chips can be formed?

   Ans. Using a large depth of cut, low cutting speed.
7. Which thread is capable to bear heavy load in both directions?
   Ans. (A) Acme thread.
8. Which one is the bilateral tolerance?

   Ans. (B) 10±0.1
9. For interrupted turning we take _____ angle of inclination.
   -- Positive
   - Negative

   Ans. Negative

10. Chip breakers should produce _____ chip forms.

- Favorable
- Unfavorable

Ans. Favorable

Section- B (04x05= 20 Marks)

11. Why do we do centering of turning tools before machining? (with a sketch)

Ans. Procedure of making center drill:-

(1) According to drawing select the center drill
(2) Mount it in drill chuck.
(3) Calculate the RPM.
(4) Insert it in work piece when taper will start. Measure the Actual diameter.
(5) Use formula

$$\sqrt{3}\left[\frac{\text{Required diameter- Actual diameter}}{2}\right]$$

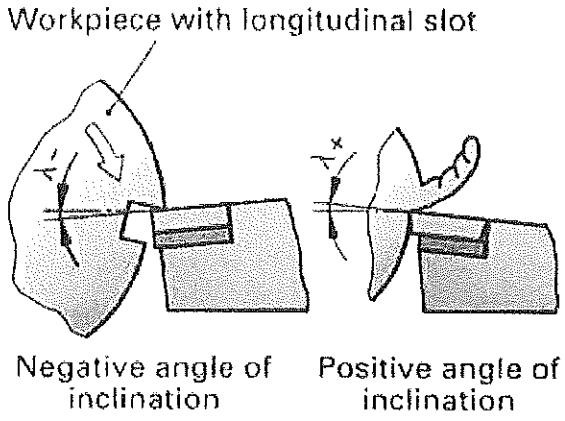
(6) Calculate the distance, and put center drill inside the work piece calculated distance with the help of tail stock.

12. What advantages does a negative angle of inclination for the tool holder have?

Ans.

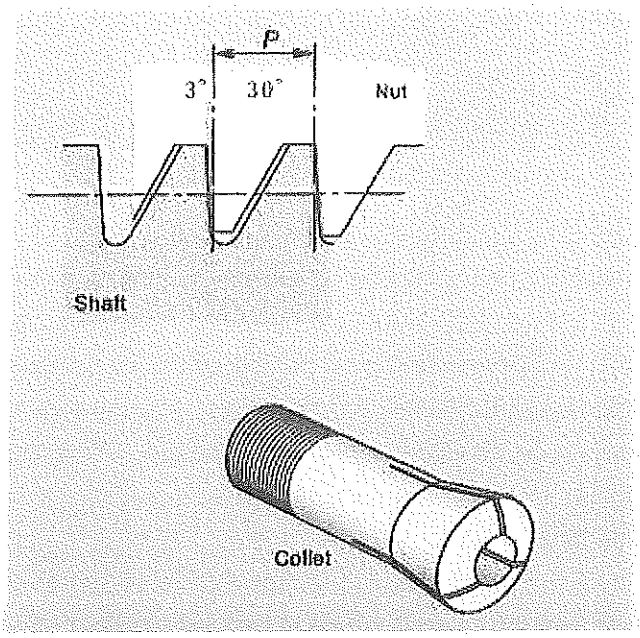
Advantages:-

a) It should guide the chip towards workpiece Surface.
b) It helps in interrupted Turning on Lathe.
c) It displaces the initial contact between workpiece and tool away from the cutting edge.



13. Define buttress thread by their thread cross-section.

Ans.



Cross Section

Buttress Thread

Buttress threads have a non-symmetrical thread cross section with a 33° thread angle.

They are used as adjustment threads where a heavy, one-sided load is present.

This is the case, for example, with collets on lathes or milling machines.

14. Define Average roughness value (Ra) and Average maximum height of the profile (Rz). Which value is greater for the same surface roughness?

Ans.

R_a= Mean Peak to Valley Height

The Mean Peak to Valley Height (R_a) is the mean of all deviations in the roughness profile from the median line. It is given in Microns.

R_Z= Averaged peak to valley Height

The Averaged peak to valley Height is mean figure obtained from five successive individual Sections. For this purpose an assessment length (l_e) divided up into five equal measurement section. This distance between highest and lowest profile point is then measured for each section. This distance is referred to as the individual peak to valley height (Z). The formula for calculating the mean peak to valley height is as follow

R_Z= 1/5 (Z_1+Z_2+Z_3+Z_4+Z_5).

For same surface roughness R_Z value is greater.

Section- C (02x10=20 Marks)

15. Calculate the theoretical surface roughness during turning if corner radius is 0.6 mm and feed rate is 0.4 mm and also define Ra & Rz.

Ans. $R_{th} = f^2 / 8. r_e$

$= 0.4 / 8 \times 0.6mm$

$= 0.033mm = 33\mu m$

R_a = The Mean Peak to Valley Height (R_a) is the mean of all deviations in the roughness profile from the median line.

R_Z = The Averaged peak to valley Height is mean figure obtained from five successive individual Sections. For this purpose an assessment length (l_e) divided up into five equal measurement section. This distance between highest and lowest profile point is then measured for each section. This distance is referred to as the individual peak to valley height (Z).

16. Explain at least 5 components of lathe machine.

Ans.

1.) **Lathe bed** – The lathe bed is fixed to the lathe frame and made of grey cast iron which is extremely rigid and vibration free.

2.) **Head stock** – The headstock is used to transmit working energy to the work piece.

3.) **Tailstock** – The tailstock serves as a steady for long work piece and is also used for holding tools.

4.) **Saddle**- The longitudinal slide runs on the guide ways of the lathe bed. It can move by hand or through lead screw or feed shaft.

5.) **Cross Slide**- The cross slide is driven by threaded spindle. For transverse movement cross slide is required.

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WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3001
Time (Minutes): 90

Course Name: Advance Conv. Manufacturing
Maximum Marks: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Marks.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section-A (1x10=10 marks)

1. Which type of abrasive is used for the structural steel? 1 mark
   Ans. (c) Aluminum oxide

2. Which one of the types of wears is caused due to fluctuations in temperature? 1 mark
   Ans. (b) Thermal cracks and (d) chips & splinters

3. What is the designation for hardness grade range A-D of an abrasive tool? 1 mark
   Ans. (b) Extremely soft

4. RF abbreviation is used for which one of the following bond types? 1 mark
   Ans.(d) Fiber reinforced

5. What is the range of abrasive grainsize number for medium designation in grinding wheel? 1 mark
   Ans. (b) 30 to 60

6. What is coolant concentration percentage for grinding? 1 mark
   Ans.(c) 5%

7. What is the Normal Clearance angle in Tool? 1 mark
   Ans.(b) 6-8°

8. Which tool is used for making corner radius? 1 mark

Ans.(b) ball nose cutter

9. What is the R.P.M for slit cutter? 1 mark

Ans. (c) 200-300

10. Type 'H' milling cutters are used to cut materials: 1 mark

Ans. (b) Hard & tough

Section- B **(5x4=20 marks)**

11. Explain the form of teeth? 5 marks

Ans. Two types of teeth are commonly used:

Involute teeth:

- Generally used teeth form.
- Flexibly used for limited change in center distance.
- Easy to manufacture because face and flank are generated in single curve.
- Pressure angle is constant.

Cycloidal teeth:

- Used in clock & watches.
- Cannot be used for flexible center distance.
- Difficult to manufacture because face and flank are generated in two different curves.
- Pressure angle is not constant.

12. What is Milling? Explain different types of Milling? 5 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

13. Write the name of different types of gear? 5 marks

Ans. 1. spur gear

2. Bevel gear

3. Helical gear

4. Herringbone gear

5. Rack & pinion

14. Explain any four type of tool wear? 5 marks

Ans. 1. flank wear: -flank wear is the most common type of wear on the cutting edges of the milling cutter .it is caused by the friction between the tool flank and the workpiece.

2.crater wear: -crater wear occurs when the tool temperature is too high. Crater wear is the loss of carbon in the tool cutting edges as a result of overheating during the cutting process.

3.edge fracture: -if indexable cutter inserts of insufficient strength are used, edge fracture result from the impact stress that develops.

4.thermal cracks: -the expansion and contraction resulting from frequent changes temperature cause the cutting material to fatigue and give rise to thermal cracks in the cutting edges.

5.chips and splinters: -excessive cutting pressure, fluctuating temperature and insufficient cutter insert strength cause chipping and splintering.

6.edge build -up: -edge build -up forms on the cutting edge from the bonding of small pieces of material on the tool flank when the cutting speed is too low and the material is too strong.

Section- C **(10x2=20 marks)**

15. Calculate number of teeth to be cut out if gear blank diameter is 156 mm & module of disc cutter is 3mm.

Ans.given

Blank diameter or outer diameter, Do=156 mm,

Module, m =3mm

No of teeth, z=?

We know that, outer diameter, $D_o=(z+2)\ m$

So, $z= (D_o / m)-2$

$= (156/3)-2$

$= 52-2$

$= 50$ teeth are to be cut

16. Explain the different types of milling machines?

Ans. **Universal milling machine**: -Because universal milling machines have both a horizontal and vertical spindle, they can be employed as horizontal or vertical milling machines. Due to its versatile design which includes a pivoting or sliding milling head, a tilting, rotating and pivoting milling table, as well as other special equipment.

Plano milling machine: -Plano milling machine do not have a vertical adjustable table. The milling table only moves along the longitudinal axis. The milling head is used for cross feed and height adjustment. thus, Plano-milling machine are highly suited for large, long, high and heavy workpieces.

Drilling and milling machine:-Drilling and milling machine are used for workpieces that are both very large and vary heavy. Overall heights of 8m and 15m travel lengths are not uncommon. These machines facilitate long feed strokes.

Horizontal milling machine:-on a horizontal milling machine, the milling spindle is positional horizontal. a steady with an adjustable support bearing enables the milling cutter to shift axially. It is used to mill longer workpiece with uniform surface profiles.

Vertical milling machine:-on a vertical milling machine, in contrast to horizontal milling machines, the milling spindle is positioned vertically. The milling head pivots and the milling cutter can be adjusted vertically with in the milling head.

CNC milling machine: -CNC=computerized numerical control typically have a three-axis-continuous-path-control. Each axis is driven by its own feed drive through a direct sensing measuring path system. The axes have backlash-free ball-type liner drives. The auto-mated tool exchange requires a quick -release clamping fixture for steep-angle taper tools or hollow-shank taper tools with electro -hydraulic control.

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3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3002
Time (Minutes): 180

Course Name: Advanced Hand Skill
Maximum Marks: 100 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 20 Questions. Each question carries 1 Mark.
4. Section B contains 06 Questions. Each question carries 5 Marks. (In total 8 questions Attempt only 6)
5. Section C contains 05 Questions. Each question carries 10 Marks.

Section-A (20 x 01 = 20)

1. How many cutting edges are there in a drill?
   a) 1
   b) 2
   c) 3
   d) 4
2. What would be the procedure for tapping process?
   a) Drill – tap
   b) Drill – core drill – tap
   c) Drill – csk – tap
   d) Spot drill – drill – csk – tap
3. What would be the 'tap depth' formula for 'blind tap' if thickness of work piece is H and tap dia is d?
   a) H + 0.3d + 3
   b) H + 0.5d + 3
   c) H + 0.7d + 3
   d) H + d + 3
4. What is the use of knife edge ruler?
   a) To check 90°
   b) To check parallelism
   c) To check flatness
   d) None of the above

5. 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
6. Rake angle will be negative –
    a) When wedge angle become less
    b) When the sum of relief angle and clearance angle is more than 90°
    c) When the sum of relief angle and clearance angle is less than 90°
    d) None of the above
7. Which chisel is used in making lubricating grooves?
    a) Flat chisel
    b) Web chisel
    c) Cape chisel
    d) Round nose chisel
8. Hole making is the application of filing;
    a) True
    b) False
9. Which one is not the application of chamfer?
    a) To ease lead during fitting
    b) To reduce the risk of cut injuries on the work piece edges
    c) To make work piece edges esthetically pleasing
    d) None of the above
10. What would be the sum of wedge angle, rake angle and relief angle?
    a) Equal to 90°
    b) Less than 90°
    c) More than 90°
    d) None of the above
11. What is the use of web chisel?
    a) To clean up weld seams
    a) To chisel narrow flat keyways
    b) To make cavities and slots
    c) None of the above
12. V-block is used for which type of work piece?
    a) Round work piece
    b) Flat work piece
    c) Cubical work piece
    d) None of the above

13. Spot drill is always used before drill because:
    a) It reduces the pressure
    b) It increases the size of drill
    c) It guides the drill
    d) None of the above

14. For M8 (tap) what diameter of drill should be done?
    a) 6.6 mm
    b) 6.7 mm
    c) 6.8 mm
    d) 6.9 mm

15. What would be the tolerance range of reamer?
    a) 5 – 10 microns
    b) 10 – 15 microns
    c) 10 – 20 microns
    d) 15 – 20 microns

16. At what RPM 'edge finder' should be run during taking zero?
    a) 300 – 400
    b) 400 – 500
    c) 500 – 600
    d) 600 – 700

17. Which one is not the soft jaw material?
    a) Wood
    b) Plastic
    c) Mild steel
    d) Aluminum

18. Which one can't measure the flatness of a surface?
    a) Try square
    b) Knife edge ruler
    c) Vernier height gauge
    d) None of the above

19. What is the formula of chamfer for radius R?
    a) 0.5 R
    b) 0.6 R
    c) 0.7 R
    d) 0.8 R

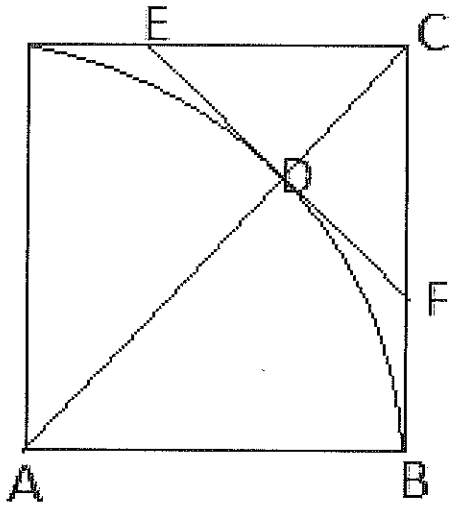
20. During clamping of saw blade, the cutting teeth should be in which direction?
    a) In forward direction
    b) In backward direction
    c) Neither in forward nor in backward direction
    d) None of the above

Section- B (Attempt Any 6 questions) **(06 x 05 = 30)**

21. Write the types of saw cut with figures.
22. Write the difference between cut file and milled file.
23. Draw bench vise and label its parts.
24. What occupational safety should be considered during filing?
25. Why sheet metal is not scribed by any hard material than the sheet metal's material?
26. Explain the chip formation process with a sketch.
27. What is reference plane/line? Explain it with a sketch.
28. Why wedge angle should always be as small as possible but as large as necessary?

Section- C **(05 x 10 = 50)**

29. Define the followings:
    a) Drilling **b)** Reaming **c)** Tapping **d)** CSK
30. What is a chisel? Explain its type with applications.
31. Derive the formulae of chamfer (CF = CE) for radius 'R', where AB = BC = AD = R for radius R.



32. Describe free cutting in sawing. Explain various types of saw blades with the help of diagrams.
33. Write the formula of cutting speed and define its nomenclature with its unit. If cutting speed is 70 m/min and tool diameter is 5.5 mm then calculate the RPM.

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SCHOOL OF MANUFACTURING SKILLS
3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3002
Time (Minutes): 180

Course Name: Advanced Hand Skill
Maximum Marks: 100 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 20 Questions. Each question carries 1 Mark.
4. Section B contains 06 Questions. Each question carries 5 Marks. (In total 8 questions Attempt only 6)
5. Section C contains 05 Questions. Each question carries 10 Marks.

Answer - Sheet

Section-A **(20 x 01 = 20)**

1. How many cutting edges are there in a drill?
   Ans. (b) 2
2. What would be the procedure for tapping process?
   Ans. (d) Spot drill – drill – csk – tap
3. What would be the 'tap depth' formula for 'blind tap' if thickness of work piece is H and tap dia is d?
   Ans. (b) H + 0.5d + 3
4. What is the use of knife edge ruler?
   Ans. (c) To check flatness
5. What happens if the size of clearance angle / relief angle becomes very less?
   Ans. (a) The friction will be more and the surface quality will be bad
6. Rake angle will be negative –
   Ans. (d) None of the above
7. Which chisel is used in making lubricating grooves?
   Ans. (d) Round nose chisel
8. Hole making is the application of filing;
   Ans. (b) False
9. Which one is not the application of chamfer?
   Ans. (d) None of the above
10. What would be the sum of wedge angle, rake angle and relief angle?
    Ans. (a) Equal to 90°

11. What is the use of web chisel?

Ans. (c) To make cavities and slots

12. V-block is used for which type of work piece?

Ans. (a) Round work piece

13. Spot drill is always used before drill because:

Ans. (c) It guides the drill

14. For M8 (tap) what diameter of drill should be done?

Ans. (c) 6.8 mm

15. What would be the tolerance range of reamer?

Ans. (c) 10 – 20 microns

16. At what RPM 'edge finder' should be run during taking zero?

Ans. (b) 400 – 500

17. Which one is not the soft jaw material?

Ans. (c) Mild steel

18. Which one can't measure the flatness of a surface?

Ans. (c) Vernier height gauge

19. What is the formula of chamfer for radius R?

Ans. (b) 0.6 R

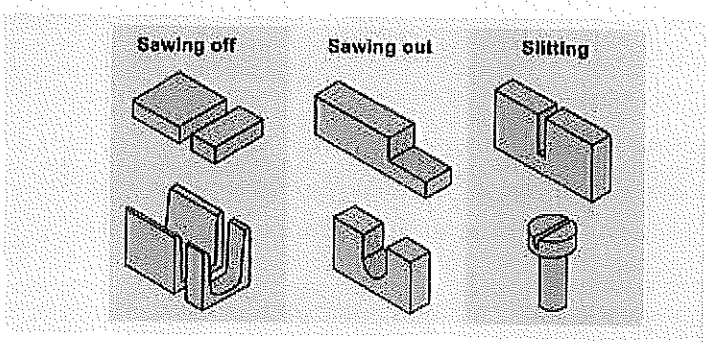
20. During clamping of saw blade, the cutting teeth should be in which direction?

Ans. (a) In forward direction

Section- B (Attempt Any 6 questions) **(06 x 05 = 30)**

21. Write the types of saw cut with figures.

Ans. There are three types of saw cuts –



22. Write the difference between cut file and milled file.

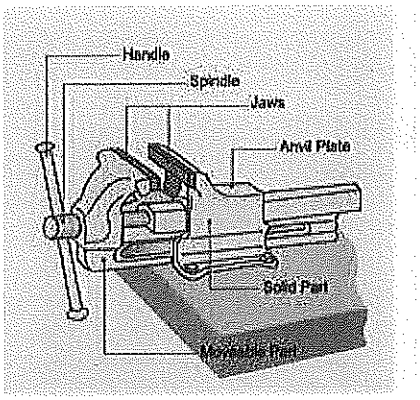
Ans.

Cut file – cut files are made by chiseling notches into the file face. This results in a file with a negative rake angle and a scraping effect. Therefore, cut files are preferred for hard materials.

Milled file – milled files are made by milling the cutting edge into the file face. Files with milled teeth have a positive rake angle, and therefore cut better than cut files. Milled files are especially suited for use on soft materials.

23. Draw bench vise and label its parts.

Ans.



24. What occupational safety should be considered during filing?

Ans. During filing, pay special attention to the following:

a) The work piece must be tightly clamped in the vise.

b) Check for a solid seating of the file handle.

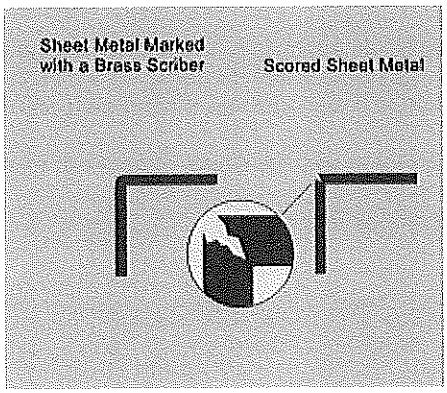
c) Damaged file handles are to be replaced immediately.

d) Remove fie chips with the chip brush, not with your fingers.

e) Deburr the work piece on all sides.

25. Why sheet metal is not scribed by any hard material than the sheet metal's material?

Ans. Because, if sheet metal is scribed by any hard material then a v-shaped notch will occur on the sheet and sheet is bent from that scribing line, the scored sheet metal would break along the scribed line.



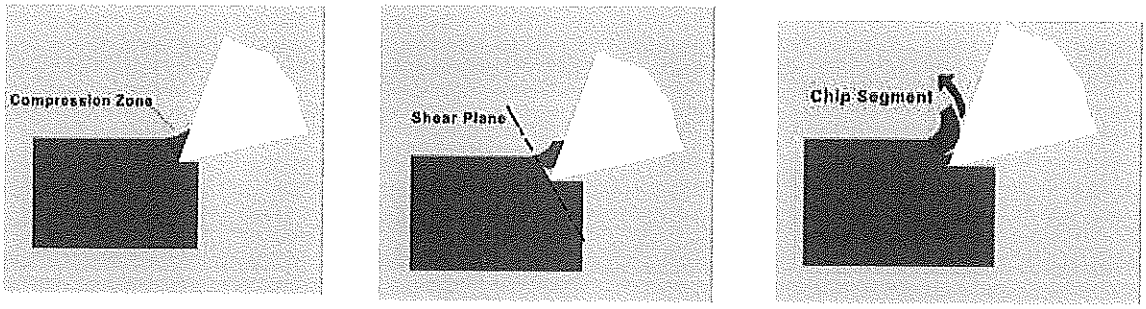
26. Explain the chip formation process with a sketch.

Ans. Chips formation process can be divided into mainly three phases:

a) Compression – when tool come in contact with the raw material then the material is started compressing and it compresses at a certain limit.

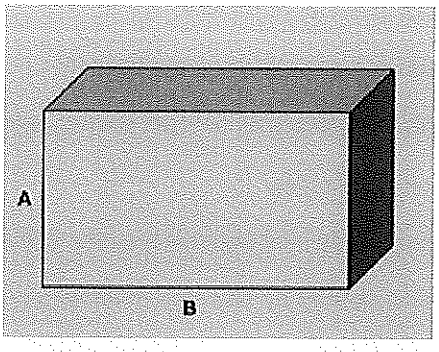
b) Shearing – when chips want to shift from its position due to tool load then a friction force starts working and so that there are two forces and these forces are in opposite direction and parallel, this process is shearing.

c) Sliding – in this process chip just slides through the rake angle of the tool.



27. What is reference plane/line? Explain it with a sketch.

Ans. Reference plane/line works as a origin, means when any plane/line is considered as reference then that plane/line becomes zero for the measuring process.



In this sketch the red color lines works as reference lines and all the value will be measured from this red lines.

28. Why wedge angle should always be as small as possible but as large as necessary?

Ans. Because, If tool's wedge angle is very less so it can penetrate deeper more easily but the chances of breaking the tool is also more so for a particular type of material there should always be a required wedge angle so that it can not break during penetration.

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Section- C (05 x 10 = 50)

29. Define the followings:

Ans.

a) Drilling – It is a process of making hole onto the work piece.

b) Reaming – It is a process of enlarging a hole with high surface quality and within tolerance of 10 – 20 microns.

c) Tapping – It is a process of making internal thread with a special tool named 'tap'.

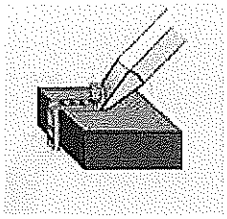
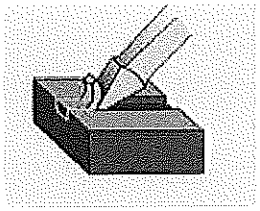
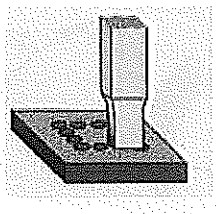
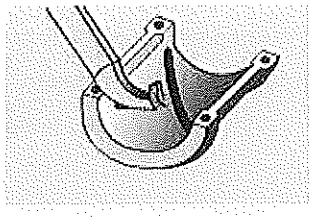
d) CSK – It is a process of making chamfer on a hole.

30. What is a chisel? Explain its type with applications.

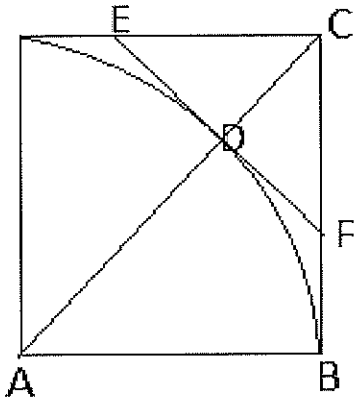
Ans. Chisel is the simplest form of the metal removal tools. Cold chisels are manufactured out of tool steel. In addition, the chisel's cutting wedge is hardened.

Types of chisel –

a) Flat chisel – the flat chisel is used to work on flat surfaces and to clean up weld seams.
b) Cape chisel – the cape chisel is used mainly to chisel narrow, flat keyways.
c) Web chisel – it is used in making cavities and slots.
d) Round nose chisel – it is used to make lubricating grooves.

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



Ans. In triangle ABC –

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

$$AC = \sqrt{(AB^2 + BC^2)} = \sqrt{(R^2 + R^2)} = \sqrt{2R^2} = R\sqrt{2} = 1.414R$$

Since, $AC = AD + DC$; $DC = AC - AD = 1.414R - R = 0.414R$

In triangle CDF –

Since DC and DF are equal,

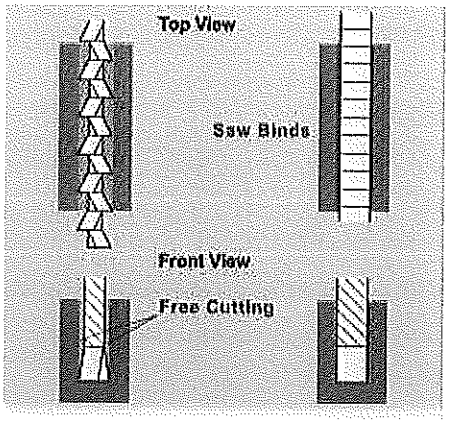
Hence, $CF^2 = DC^2 + DF^2 = 0.414R^2 + O.414R^2$

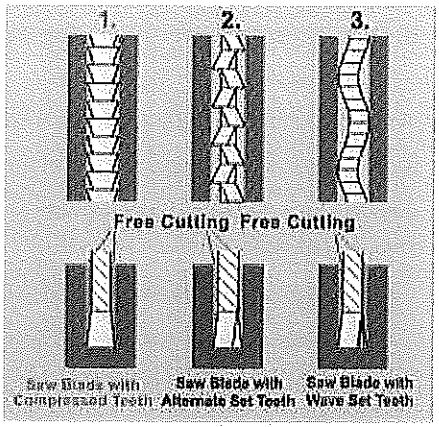
$CF = \sqrt{(0.414R^2 + 0.414R^2)} = 0.414R\sqrt{2} = 0.414R \times 1.414$

$CF = 0.58R$

32. Describe free cutting in sawing. Explain various types of saw blades with the help of diagrams.

Ans. To prevent the saw blade from binding, the kerf must be wider than the thickness of the saw blade. If this is not the case, the saw blade will bind. Therefore the saw blades are designed so that they cut themselves free.





Free cutting types:

a) Compression of the teeth
b) Alternation of the teeth
c) Wave setting of the teeth

33. Write the formula of cutting speed and define its nomenclature with its unit. If cutting speed is 70 m/min and tool diameter is 5.5 mm then calculate the RPM.

Ans. The formula of cutting speed is –

$$Vc = \pi DN / 1000,$$

Where, Vc = cutting speed in m/min

D = diameter of tool/work piece in mm

N = RPM

With this formula, $70 = 3.14 \times 5.5 \times N / 1000$

$N = 4053$ rev/min

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SCHOOL OF MANUFACTURING SKILLS
3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3003 | **Course Name**: Electropneumatics
Time (Minutes): 90 | **Maximum Marks**: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section-A **(1X10 = 10 Marks)**

1. Which one of the following sensors/switches cannot be used in environments subjected to magnetic fields?

a) Reed switch
b) Inductive sensor
c) Capacitive sensor
d) Optical sensor

2. What is Electricity?

a) Rate of flow of electron
b) Force of attraction between unlike charges
c) The form of energy contained in an atom
d) The product of the voltage and current.

3. According to ohm's law:

a) Current is directly proportional to voltage
b) Voltage is inversely proportional to current
c) Current is directly proportional to resistance
d) Voltage is directly proportional to resistance

4. In a solenoid the core material is:

a) Plastic
b) Magnet
c) Copper
d) Ferro magnet

5. A _____gives a switching signal when objects pass at a close distance to it, or within rated sensing distance.

a) Proximity switch
b) Timer
c) Counter
d) Relay

6. Dynamo works on the phenomenon of:

a) Magnetism
b) Electromagnetism
c) Electromagnetic Induction
d) Kirchhoff's law

7. _____are required in control systems to effect time delay between work operations.

a) Counters
b) Relays
c) Timers
d) Reed switches

8. In an electrical circuit, direction of flow of electrons is from:

a) The positive to the negative terminal of the source
b) The negative to the positive terminal of the source
c) The higher resistance the lower resistance
d) None of above

9. The difference in charge between the two points is called _____.

a) Current
b) Voltage
c) EMF
d) Power

10. In series circuit, the _____will be same for all of the elements.

a) Current (b) Voltage
c) EMF (d) Power

Section- B **(5X4 = 20 Marks)**

11. What is a Push button? Explain three types of push buttons.

12. Write down three advantages and two disadvantages of reed switches.

13. Explain an elementary electrical circuit consisting of three essential elements with the help of a diagram.

14. Write down any five applications of Inductive sensors.

Section- C **(10X2 = 20 Marks)**

15. Describe relays and its principle. Also write down its five functions.

16. Explain three types of Proximity sensors.

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SESSION 2018-2019

Course Code: SMS3003 **Course Name**: Electropneumatics
Time (Minutes): 90 **Maximum Marks**: 50 Marks

Answer Key

Section-A **(1X10 = 10 Marks)**

1. Which sensor/switch cannot be used in environments subjected to magnetic fields. ***Max. Marks = 01***
a) Reed switch

2. What is Electricity? ***Max. Marks = 01***
c) The form of energy contained in an atom

3. According to ohm's law: ***Max. Marks = 01***
a) Current is directly proportional to voltage

4. In a solenoid the core material is: ***Max. Marks = 01***
d) Ferro magnet

5. A _____ gives a switching signal when objects pass at a close distance to it, or within rated sensing distance. ***Max. Marks = 01***
a) Proximity switch

6. Dynamo works on the phenomenon of: ***Max. Marks = 01***
c) Electromagnetic Induction

7. _____are required in control systems to effect time delay between work operations. ***Max. Marks = 01***
c) Timers

8. In an electrical circuit, direction of flow of electrons is from: ***Max. Marks = 01***
b) The negative to the positive terminal of the source

9. The difference in charge between the two points is called _____. ***Max. Marks = 01***
b) Voltage

10. In series circuit, the _____ will be same for all of the elements. ***Max. Marks = 01***
a) Current

Section- B

11. What is a Push button? Explain the three types of push buttons. ***Max. Marks = 2 + 3 = 05***

Ans. A push button is a switch used to close or open an electric control circuit. They are primarily used for starting and stopping of operation of machinery.

1. Normally open: When the button is pressed the moving switching element acts against the force of spring and closing the terminals. When the button is released the spring restores the contact to its original position.
2. Normally Close: When the button is pressed the moving switching element acts against the force of spring and opens the contact. The circuit is therefore interrupted. When the button is released the spring restores the contact to its original position.
3. Change over: When the button is pressed the normally closed contacts are separated and interrupt the circuit. The switching element closes another normally pen contacts, thus closing the circuit. When the button is released the spring restores the switching elements to its original positions.

12. Write down three advantages and two disadvantages of reed switches. ***Max. Marks = 3 + 2 = 05***

Ans. Advantages of reed switches are:

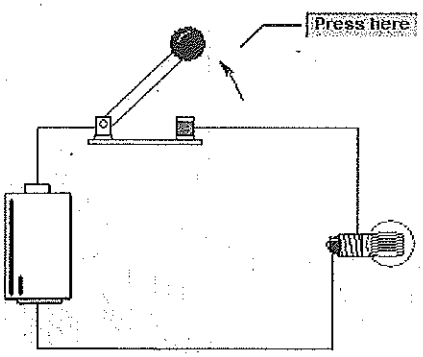
1. Reed switches are cheap
2. They have long service life
3. They have shorter switching time (in the order of 0.2 to 0.3 milli seconds)
4. They are compact and maintenance frees

Disadvantages

1. They cannot be used in environments subjected to magnetic fields (like resistance welding machine)
2. Closing of contacts in reed switch is not bounce free

13. Draw a diagram of an elementary electrical circuit consist of three essential elements. Explain them also.

Ans. ***Max. Marks = 2 + 3 = 05***



An electrical circuit consists always of a closed loop, with three essential elements:

- Power supply
  - The Power supply can be a battery, an accumulator or a generator which is the origin of the power supply to a wall plug. Without this component there is no electromotive force to move electrons.
- Load
  - The load can be a lamp, coil, or heating element etc. Without load, the connection between the two poles of the power supply with a wire would be a "short circuit". That is, the current would be the maximum capacity of the supply source and possibly so high that the connecting wire would heat up and melt.

- Switching element
  - A switching element or contact is required to interrupt the working of the load. It can be anywhere in the circuit. It opens or closes the circuit. A contact is called "open" when it makes no connection between its terminals and "closed" when this connection is made.

14. Write down any five applications of Inductive sensors. ***Max. Marks = 1 X 5 = 05***

- Sensing of end position of linear actuators like cylinders and semi rotary actuators.
- They are used to detect metallic pieces on conveyor i.e. presence or absence of work piece on conveyor.
- They are used in press to detect the end position.
- They are used to monitor drill breakage while drilling.
- They are also used as feedback devices in speed measuring devices.

Section- C

15. Describe relays and its principle. Also write down its five functions. ***Max. Marks = (2.5X2) + (1X5) = 10***

Ans. Relay is an electrically operated switch. It consists of a coil with an iron core and one or more contacts, switched by the magnetic field of the coil assembly. An electrical device, typically incorporating an electromagnet, which is activated by a current or signal in one circuit to open or close another circuit.

When the voltage is applied to the coil, an electric current flows through the coil; a magnetic field builds up and causes the armature to be pulled into the core of winding. The switching position is maintained as long as the voltage is applied. When the voltage is removed, the armature is restored to its original position by the return spring.

1. Changing from a N.C. to a N.O. contact (inversion)
2. Multiplying contacts from one to any reasonable number of contacts
3. Power Amplification
4. Voltage Change
5. Memory function

16. Explain three types of Proximity sensors. ***Max. Marks = 4 + (3X2) = 10***

Inductive sensors:

- Inductive sensor use currents induced by magnetic field to detect the nearby metal objects. The inductive sensor uses a coil or inductor to generate a high frequency magnetic field as shown in **Figure.**
- If there is a metal object near the changing magnetic field, current will flow in the object. This resulting current flow sets up a new magnetic field that opposes the original magnetic field.
- The net effect is that it changes the inductance of the coil in the inductive sensor. By measuring the inductance, the sensor can determine when a metal have been brought nearby.
- These sensors will detect any metals, when detecting multiple types of metal multiple sensors are used.
- In addition to metals, graphite also can be sensed. It is important to note that these work by setting up a high frequency field.
- If a target nears the field will induce eddy currents. These currents consume power because of resistance, so energy is in the field is lost, and the signal amplitude decreases.
- The detector examines filed magnitude to determine when it has decreased enough to switch.
- The sensors can detect objects a few centimetres away from the end.

Capacitive sensor:

- In the capacitive type, a moving object pass through an electrostatic field produced by the sensor.
- The change in circuit capacitance produces a switching signal.
- These sensors work well for insulators (such as plastics) that tend to have high dielectric coefficients, thus increasing the capacitance.
- But, they also work well for metals because the conductive materials in the target appear as larger electrodes, thus increasing the capacitance.

Optical (photoelectric) Sensor:

- A photoelectric sensor will give a switching signal when a pre-set level of light is received.
- These are used to detect the presence of moving objects such as the presence or absence of objects on conveyor system, a break in moving roll of material, a lack of or incorrect level of liquid in a bottle filling operation, detection of objects of a certain colour etc.
- The switching signal produced by a moving object can be fed into the electrical control circuit to provide a corrective action.

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3rd SEMESTER, END-SEMESTER EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
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Course Code: SMS3004
Time (Minutes): 90

Course Name: ADVANCE MEASURING
Maximum Marks: 50 Marks

Instructions:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Marks.
5. Section C contains 02 Questions. Each question carries 10 Marks.

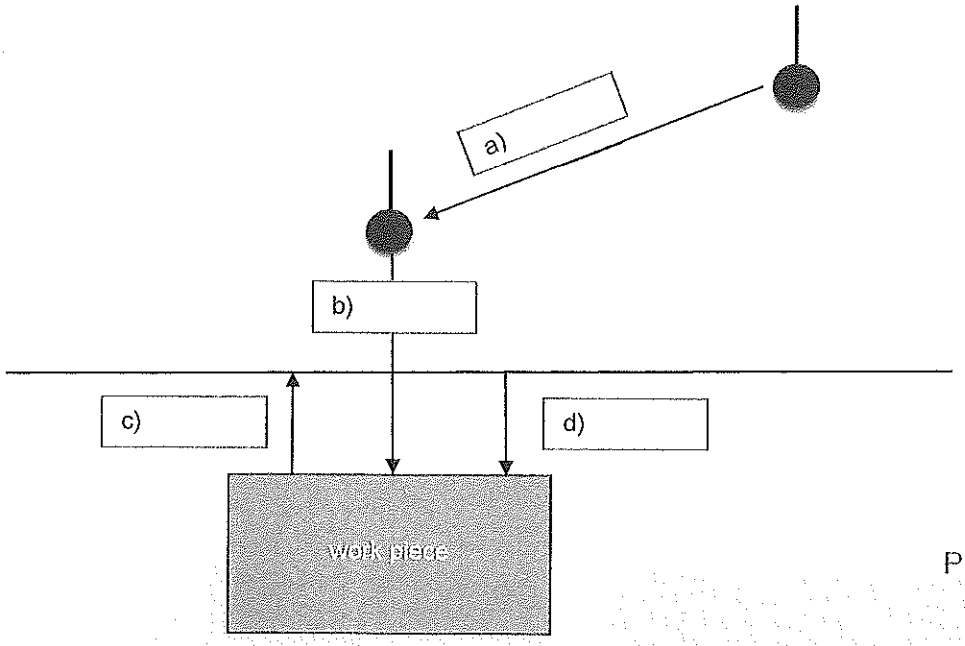
Section-A (10X1= 10 Marks)

1. Maximum material condition of an island means:
   a) Minimum size of island
   b) Maximum size of island
2. A circle element is measured with minimum points:
   a) One
   b) Two
   c) Three
   d) Cannot say
3. Which one of the is not a point element:
   a) Point
   b) Sphere
   c) Cylinder
   d) Circle
4. Six degree of freedom means:
   a) Freedom of rigid body in space in rotation.
   b) Freedom of rigid body in space in linear.
   c) Rigid body cannot move until an external force as per newton's law of inertia.
   d) Freedom of rigid body in space in rotation and linear.
5. If a vertical solid cone is cut by horizontal plane the top view of the frustum looks as:
   a) Cone
   b) Cylinder
   c) Point
   d) Circle

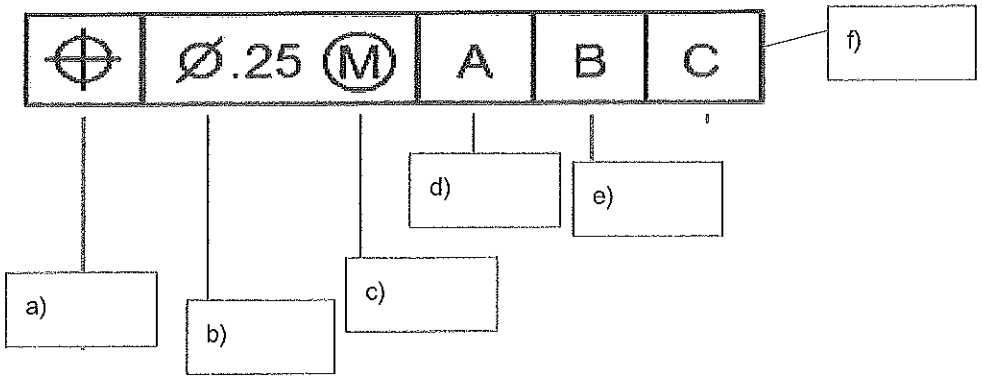
6. If a plane and straight line intersect it forms a geometry of:
    a) Hole
    b) Cylinder
    c) Point
    d) Ellipse
7. Normally measurements should be carried out in temperature of:
    a) 19° centigrade.
    b) 20° centigrade.
    c) 21° centigrade.
    d) Natural and constant temperature.
8. Any inspection process is affected by:
    a) Person
    b) Methodology of inspection
    c) Measurement standard
    d) All the above
9. Which probe head we are using in CMM?
    a) Fixed type
    b) Motorized type
    c) Manual Type
    d) All of the above
10. Maximum length range for TP20SF with steel extension and stylus is
    a) 40
    b) 18.7
    c) 20
    d) None of the above

Section- B **(4X5=20 Marks)**

11. Fill in the box:



12. Fill in the box



13. Define tolerances:

    a) Cylindricity

    b) Flatness

    c) Concentricity

    d) Position

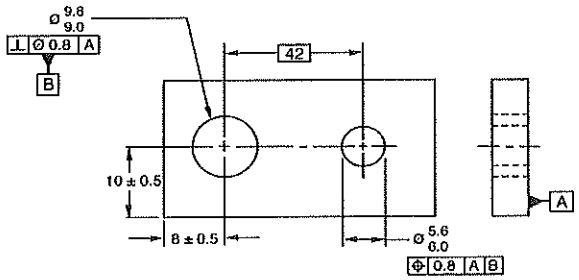
    e) Profile

14. Name the parts of CMM.

Section- C **(2X10=20 Marks)**

15. Draw PROBE HEAD assembly.

16.



a) The basic dimension given in the drawing is.....

b) ..... is the secondary datum.

c) The position of dia. 5.6 hole is given from.....

d) In position tolerance ⌖ Ø symbol before 0.8 value is missing:

- TRUE
- FALSE

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3RD SEMESTER, END-SEMESTER EXAMINATION
SUMMER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3004
Time (Minutes): 90

Course Name: Advanced Measuring
Maximum Marks: 50

Section- A **(1x10=10 Marks)**

1. Maximum material condition of an island means:
   Ans. b) Maximum size of island
2. A circle element is measured with minimum points:
   Ans. c) Three
3. Following is not a point element.
   Ans. c) Cylinder
4. Six degree of freedom means:
   Ans. d) Freedom of rigid body in space in rotation and linear.
5. If a vertical solid cone is cut by horizontal plane the top view of the frustum looks as:
   Ans. d) Circle
6. If a plane and straight line intersects it forms a geometry of:
   Ans. c) Point
7. Normally measurements should be carried out in temperature of:
   Ans. b) 20 degree centigrade.
8. Any inspection process is affected by:
   Ans. d) All the above
9. Write types of angle of MH20i
   Ans. twist (A) and rotate (B)
10. Maximum length range for TP20SF with steel extension and stylus is.....
    Ans. 40 mm

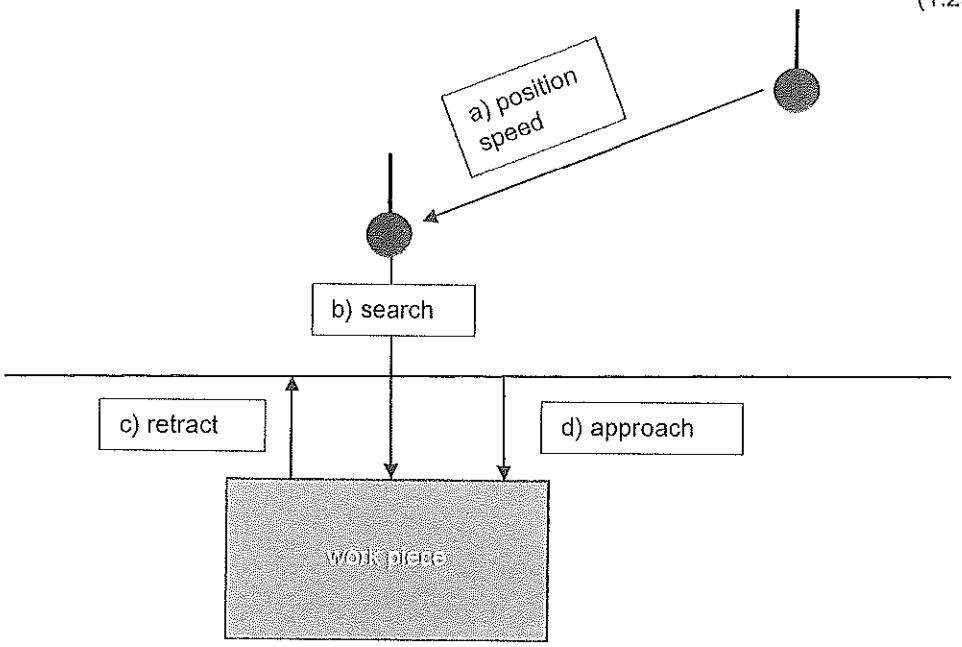
Answer Key

Section- B

(4X5=20 Marks)

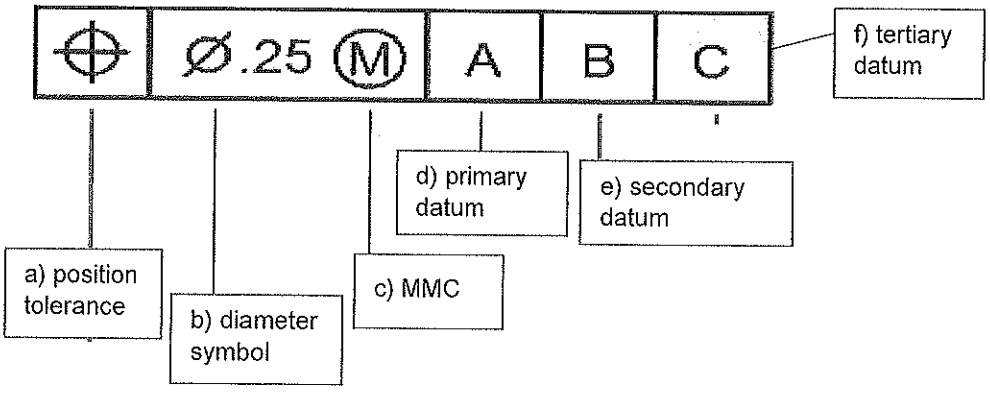
11. Fill in the box

(1.25X4=5 Marks)



12. Fill in the box

(0.83X6=5 Marks)



Answer Key

13. Define tolerances: (1X5=5 Marks)

Ans.

a) Cylindricity - Cylindricity is a 3-Dimensional tolerance that controls the overall form of a cylindrical feature to ensure that it is round enough and straight enough along its axis.

b) Flatness - flatness tolerance defines a zone between two parallel planes within which a surface must lie.

c) Concentricity - concentricity is a complex tolerance used to establish a tolerance zone for the median points of a cylindrical or spherical part feature.

d) Position - position is a versatile tolerance that can be used to control location, coaxiality, orientation or axis offset of a part feature or axis.

e) Profile - Profile of a surface describes a 3-Dimensional tolerance zone around a surface, usually which is an advanced curve or shape.

14. Name parts of CMM. (0.55X9=5 Marks)

Ans.

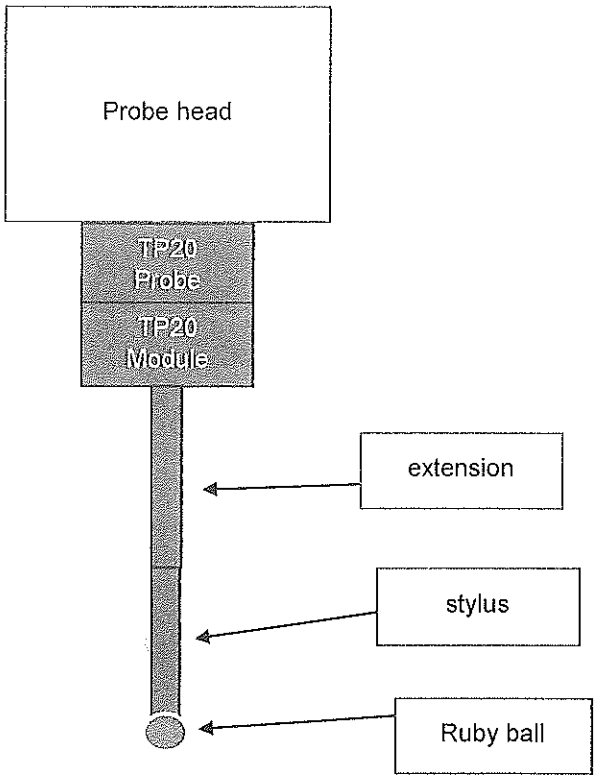
- Granite Structure
- Servo motor
- Air Bearings
- Probe Heads
- Probes
- Styli
- Controller
- Software
- Measuring scales (Each axis)

Section- C

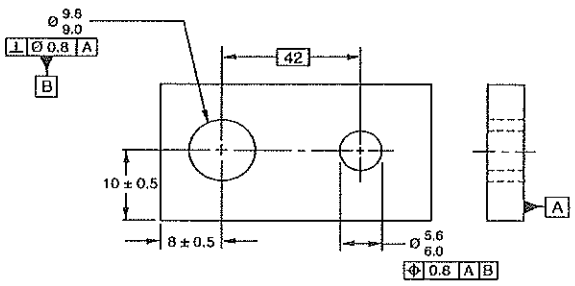
(2X10=20 Marks)

15. Draw PROBE HEAD assembly. (1.67X6=10 Marks)

Ans.



16. (2.5X4=10 Marks)



Ans.

a) 42
b) Hole 9.8/9.0
c) Top plane and side plane
d) True

Answer Key

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3rd SEMESTER, SECOND IN- SEM. EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3005
Time (Minutes): 90

Course Name: CNC Milling
Maximum Marks: 50

Instructions:

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

Section- A (10X1=10)

1. Edge finder is used to:
   a) Cut the material
   b) Take the reference point X and Y direction
   c) Take the reference point in Z direction
   d) Take the reference point in X, Y and Z direction
2. CNC Stands for:
   a) Computer numerical control
   b) Computerized numerical control
   c) Computer numerically control
   d) Both a & b
3. What is the full form of MCU?
   a) Manufacturing control unit
   b) Multipoint control unit
   c) Machine control unit
   d) None of the above
4. ATC stand for:
   a) Automatic Tool Control
   b) Automatic tool changer
   c) Automatic turret control
   d) None of the above

5. A Coordinate system in which the point is specified in a plane by a pair of coordinates which are signed distance to the point from two perpendicular lines, measured in same unit length is known as
   a) Polar Coordinate system
   b) Cartesian coordinate system
   c) Point coordinate system
   d) All of the above

6. The machining process of using rotary cutters to remove material from a workpiece by advancing (or *feeding*) the cutter into the workpiece at a certain direction is called
   a) Turning
   b) Milling
   c) Both a&b
   d) None of the above

7. G02 is named as:
   a) Linear interpolation
   b) Circular interpolation Clockwise
   c) Circular Interpolation Anti clockwise
   d) None of the above

8. G90 is named as:
   a) Absolute Coordinate
   b) Incremental Coordinate
   c) Feed in mm/rev
   d) Feed in mm/min

9. Which operations can be performed on Vertical Milling Machine?
   a) Facing
   b) Drilling
   c) Tapping
   d) All of the above

10. When the tool moves from one point location to another specified point, generally to do hole operations such as drilling, boring, reaming, tapping and punching, is which type of control system?
   a) Continuous path control System
   b) Point to Point Control System
   c) Both a&b
   d) None of the above

Section- B

(4X5=20)

11. What is Machine Coordinates?

12. which color code is used to show Mild Steel?

13.Calculate the Spindle RPM and Feed in mm/min for the given data:

Tool- Facemill ϕ50 with 5 insert

Vc= 200 m/min

Feed per tooth= 0.2 mm/rev.

14. What do you mean by continuous path system?

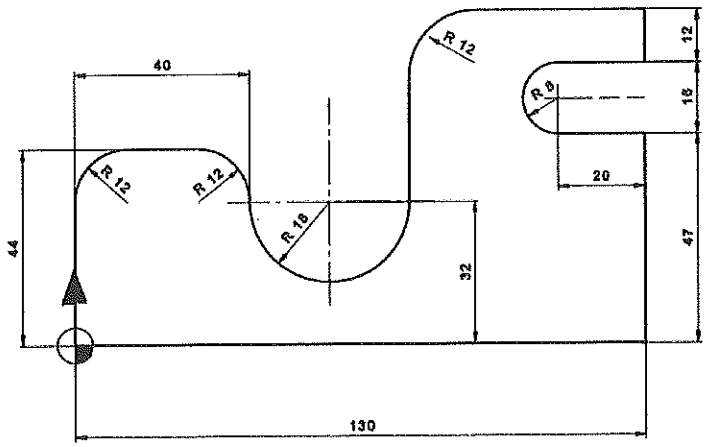
Section C

(2X10=20)

15. Write a program for the given drawing.

Total Depth: 5 mm

Depth of Cut: 0.5 mm



16. What are advantages and disadvantages of Down Milling (Climb Milling)?

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3rd SEMESTER, SECOND IN- SEM. EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3005
Time (Minutes): 90

Course Name: CNC Milling
Maximum Marks: 50

Instructions:

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

Section- A (10X1=10)

1. Edge finder is used to:
   a) Cut the material
   b) Take the reference point X and Y direction
   c) Take the reference point in Z direction
   d) Take the reference point in X, Y and Z direction

Ans: b

2. CNC Stands for:
   a) Computer numerical control
   b) Computerized numerical control
   c) Computer numerically control
   d) Both a & b

Ans: d

3. What is the full form of MCU?
   a) Manufacturing control unit
   b) Multipoint control unit
   c) Machine control unit
   d) None of the above

Ans: c

4. ATC stand for:
    a) Automatic Tool Control
    b) Automatic tool changer
    c) Automatic turret control
    d) None of the above

Ans: b

5. A Coordinate system in which the point is specified in a plane by a pair of coordinates which are signed distance to the point from two perpendicular lines, measured in same unit length is known as
    a) Polar Coordinate system
    b) Cartesian coordinate system
    c) Point coordinate system
    d) All of the above

Ans: b

6. The machining process of using rotary cutters to remove material from a workpiece by advancing (or *feeding*) the cutter into the workpiece at a certain direction is called
    a) Turning
    b) Milling
    c) Both a&b
    d) None of the above

Ans: b

7. G02 is named as:
    a) Linear interpolation
    b) Circular interpolation Clockwise
    c) Circular Interpolation Anti clockwise
    d) None of the above

Ans: b

8. G90 is named as:
    a) Absolute Coordinate
    b) Incremental Coordinate
    c) Feed in mm/rev
    d) Feed in mm/min

Ans: a

9. Which operations can be performed on Vertical Milling Machine?
    a) Facing
    b) Drilling
    c) Tapping
    d) All of the above

Ans: d

10. When the tool moves from one point location to another specified point, generally to do hole operations such as drilling, boring, reaming, tapping and punching, is which type of control system?
    a) Continuous path control System
    b) Point to Point Control System
    c) Both a&b
    d) None of the above

Ans: b

Section- B **(4X5=20)**

10. What is Machine Coordinates?

Ans: Distance Between Machine zero point and spindle Zero point.

11. which color code is used to show Mild Steel?

Ans: Blue

13.Calculate the Spindle RPM and Feed in mm/min for the given data:

Tool- Facemill ϕ50 with 5 insert

Vc= 200 m/min

Feed per tooth= 0.2 mm/rev.

Ans: : $N = \frac{Vc\ X\ 1000}{\pi x\ D} = \frac{200X1000}{3.14X50} = 1275$ RPM

Feed= Feed per tooth X N X Number of cutting insert

= 0.2X1275X5

= 1275 mm/min

14. What do you mean by continuous path system?

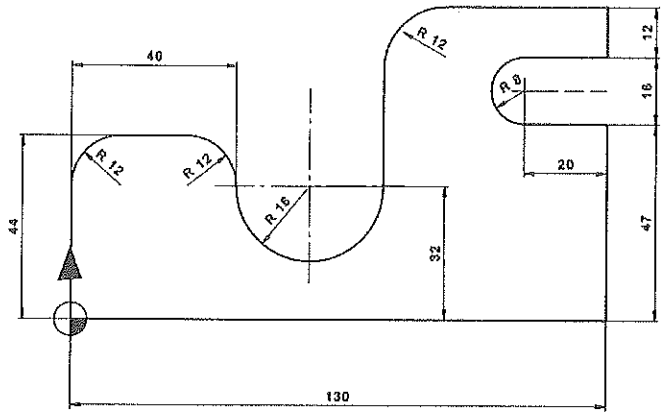
Ans: The continuous-path control system is more commonly known as the contouring system. Its function is to synchronize the axes of motion to generate a predetermined path, generally a line or a circular arc.

Section C (2X10=20)

15. Write a program for the given drawing.

Total Depth: 5 mm

Depth of Cut: 0.5 mm



O0001;

G00 G90 G40 G80 G64 G94 F0;

T01 M06 (END MILL 16);

S2000 M03;

G43 H01 X-10 Y-10 Z50;

Z0;

M98 P100002;

G00 Z50;

X200 Y120 Z120;

M30;

O0002 (sub program);
G91 Z-1;
G90 G41 D21 X0
G01 Y44 R12;
X40 R12;
G03 X 76 Y32 R18;
G01 Y75 R12;
X130;
Y63;
X110;
G03 X110 Y47 R8;
G01 X130;
Y0;
X-10;
G40 X-10 Y-10;
M99;

16. What are advantages and disadvantages of Down Milling (Climb Milling)?

Ans: Advantages of Down Milling:

1. Down-milling is always preferred wherever the machine tool, fixture and workpiece will allow.
2. In peripheral down-milling, the chip thickness will decrease from the start of cut, gradually reaching zero at the end of cut. This prevents the edge from rubbing and burnishing against the surface before engaging in the cut.
3. The large chip thickness is advantageous, and the cutting forces tend to pull the workpiece into the cutter, holding the cutting edge in the cut.
4. Better surface finish
5. Tool blunting is less

Disadvantages of Down Milling:

1. Not suitable for roughing operation
2. Cycle time increases

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3rd SEMESTER, SECOND IN- SEM. EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3006
Time (Minutes): 90

Course Name: CNC Turning
Maximum Marks: 50

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Mark.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section- A (10X1=10)

1. What character do we use to skip any block in program?
   a) @
   b) %
   c) /
   d) #
2. NC Stand for:
   a) Numerically control
   b) Numerical Control
   c) Number control
   d) All of the above
3. Process of removing metal from the end of a workpiece to produce the flat surface in which tool moves perpendicular to the axis of the workpiece.
   a) Facing
   b) Turning
   c) Grooving
   d) Drilling
4. Which is a block code?
   a) G90
   b) G91
   c) G28
   d) G03

5. What is the code for Dwell time?
    a) G15
    b) G17
    c) G04
    d) G03
6. M03 is named as:
    a) Tool rotation Clockwise
    b) Tool Rotation Anti Clockwise
    c) Spindle Rotation Clockwise
    d) Spindle Rotation Anti Clockwise
7. M01 is named as:
    a) Coolant ON
    b) Coolant OFF
    c) Program End
    d) Optional Stop
8. G92 is named as:
    a) Speed Limit
    b) Cutting speed
    c) Spindle rotation
    d) Retract up to Start plane
9. What is the unit of Cutting Velocity?
    a) mm/min
    b) mm/rev
    c) m/min
    d) None of the above
10. Which is a model code?
    a) M03
    b) G02
    c) G04
    d) M13

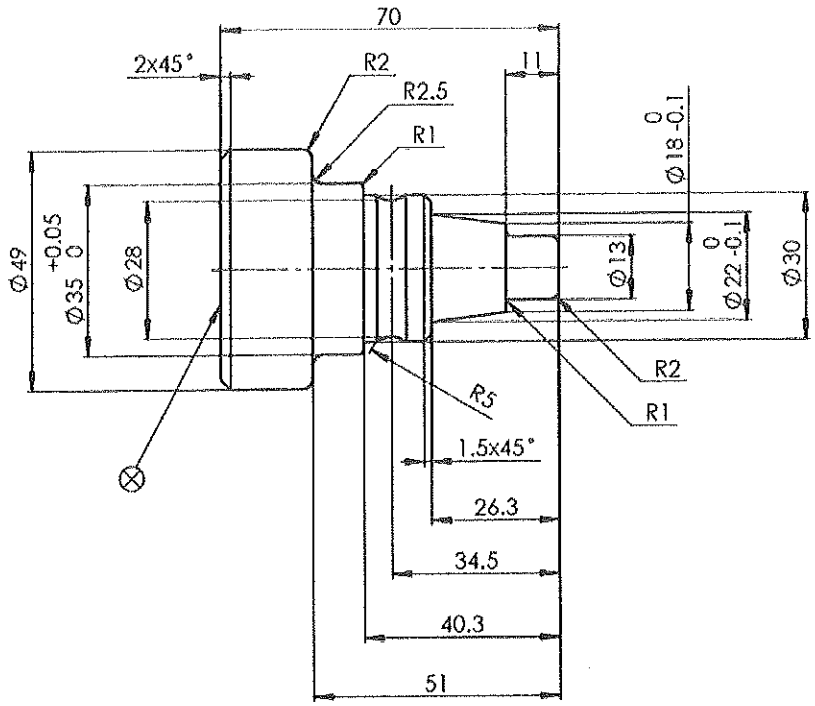
Section- B **(4X5=20)**

11. What is the use of Dry Run mode?
12. Describe G83 cycle for Turning with all parameters.
13. What do you mean by Block Code?
14. What will be the tool position number for left hand turning tool?

Section C

(2X10=20)

15. Write a program for the following drawing.



16. How the machining will be affected if rack angle increases?

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3rd SEMESTER, SECOND IN- SEM. EXAMINATION
WINTER SEMESTER, B.VOC. PROGRAM
SESSION 2018-2019

Course Code: SMS3006
Time (Minutes): 90

Course Name: CNC Turning
Maximum Marks: 50

Instructions:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 10 Questions. Each question carries 1 Mark.
4. Section B contains 04 Questions. Each question carries 5 Mark.
5. Section C contains 02 Questions. Each question carries 10 Marks.

Section- A

(10X1=10)

1. What character do we use to skip any block in program?
    a) @
    b) %
    c) /
    d) #

Ans: c

2. NC Stand for:
    a) Numerically control
    b) Numerical Control
    c) Number control
    d) All of the above

Ans: b

3. Process of removing metal from the end of a workpiece to produce the flat surface in which tool moves perpendicular to the axis of the workpiece.
    a) Facing
    b) Turning
    c) Grooving
    d) Drilling

Ans: a

4. Which is a block code?
    a) G90
    b) G91
    c) G28
    d) G03

Ans: c

5. What is the code for Dwell time?
    a) G15
    b) G17
    c) G04
    d) G03

Ans: c

6. M03 is named as:
    a) Tool rotation Clockwise
    b) Tool Rotation Anti Clockwise
    c) Spindle Rotation Clockwise
    d) Spindle Rotation Anti Clockwise

Ans: c

7. M01 is named as:
    a) Coolant ON
    b) Coolant OFF
    c) Program End
    d) Optional Stop

Ans: d

8. G92 is named as:
    a) Speed Limit
    b) Cutting speed
    c) Spindle rotation
    d) Retract up to Start plane

Ans: a

9. What is the unit of Cutting Velocity?
    a) mm/min
    b) mm/rev
    c) m/min
    d) None of the above

Ans: c

10. Which is a model code?

a) M03
b) G02
c) G04
d) M13

Ans: b

Section- B (4X5=20)

11. What is the use of Dry Run mode?

Ans: Dry run is a mode in which we can check the tool path quickly without spindle rotation.

12. Describe G83 cycle for Turning with all parameters.

Ans: G98/G99 G83 X Z P Q R F;

Where:

G98= Retract up to starting plane

G99= Retract up to Withdrawal plane;

X= Drilling position

Z= Drilling Depth

P= Dwell time in microsecond

Q= Depth per Cut in micron

F= feed in mm/rev

13. What do you mean by Block Code?

Ans: These code remain activated only in block in which it is being used.

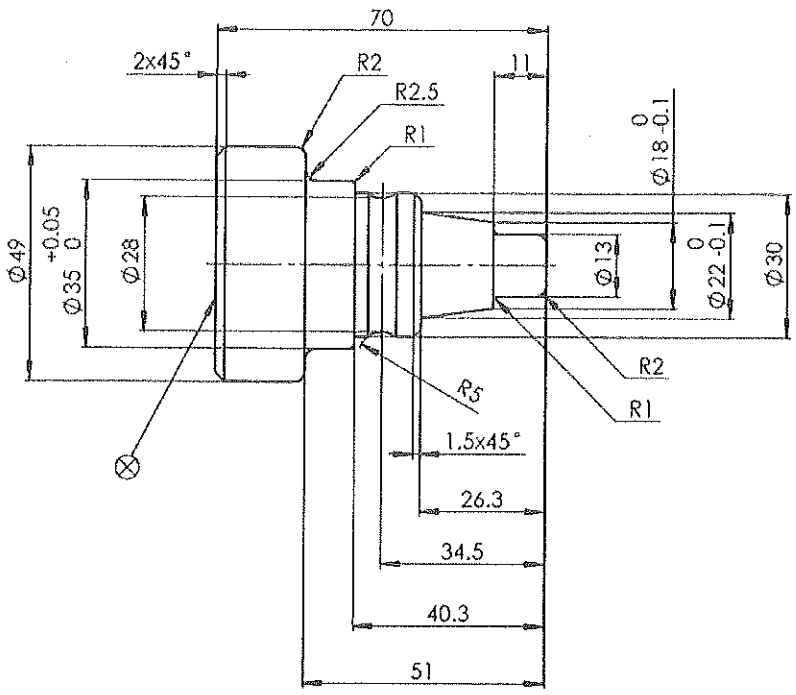
14. What will be the tool position number for left hand turning tool?

Ans: 3

Section C

(2X10=20)

15. Write a program for the following drawing.



O0001;

N5 G00 G90 G80 G40 G95 F0;

N10 T0202(LEFT 55);

N15 G92 S4000;

N20 G96 S200 M4;

N25 X50 Z1;

N30 G73 U0.5 R0.5;

N35 G73 P40 Q110 U0.1 W0.05 F0.2

N40 G00 X11;

N45 G01 Z0;

N50 X13 R1;

N55 Z-11;

N60 X22 Z-26.3;

N65 X30 C1.5;

N70 Z-31.3;

N75 G02 X28 Z-34.5 R5;

N80 G02 X30 Z- 37.7 R5;

N85 G01 Z-40.3;

N90 X35 R1;

N95 Z-51 R2.5;

N100 X49 R2;

N105 Z-54;

N110 X51;

G72 P40 Q110 F0.08;

G28 U0 W0;

M30;

16. How the machining will be affected if rack angle increases?

Ans: Rake angle is cutting edge angle that has a large effect on cutting resistance, chip disposal, cutting temperature and tool life.

Effect of rake angle:

1. Increasing rake angle in the positive (+) direction improves sharpness.
2. Increasing rake angle in the positive (+) direction decreases cutting power.
3. When to increase rake angle in negative (-) direction
    a) Hard workpieces
    b) When the cutting edge strength is required such as interrupted cutting.
4. When to increase rake angle in positive (+) direction
    a) Soft workpieces
    b) Workpiece is easy to machine
    c) When the workpiece or the machine have poor rigidity.