Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1101 **Time: 1 Hour**

Course Name: Assembly & Measuring **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 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 **05X1= 5 Marks**

1. Which measuring instruments can be used to measure internal diameter of 20.015 mm?
   a. Digital Vernier callipers
   b. Micrometer.
   c. Hole test Micrometer
   d. Plug gauge
2. Which one of the examples of form gauge?
   a. Feeler gauge
   b. Micrometre
   c. Vernier Depth gauge
   d. None of these
3. Which one of the following is not a part of a micrometer?
   a. Thimble
   b. spindle
   c. probe
   d. Anvil
4. Teeth are parallel to axis of shaft in:
   a) Helical gear
   b) Spur gear
   c) Bevel gear
   d) Herringbone gear

Registration No.: .....

5. Flat belts are used in:
   a) Bicycles
   b) Belt conveyor
   c) Synchronizing cam and crankshaft
   d) Vacuum cleaner

Section- B **02X3= 6 Marks**

6. What is the difference between accuracy and precision?

7. Explain any two conditions for using studs.

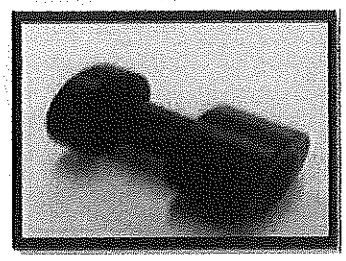
8. Which factors should we consider to select measuring tool?

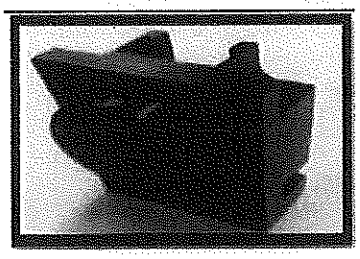
Section- C **03X3= 9 Marks**

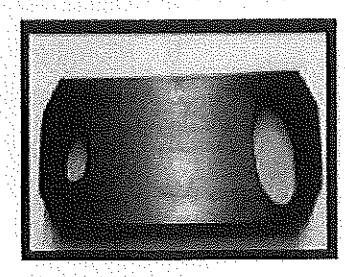
9. Explain different types of errors in measurement.

10. Describe any three types of keys with diagrams.

11. Write the name of the following Assembly parts:







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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1101

Course Name: Assembly & Measuring

Time: 1 Hour

Max. Marks: 20

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1. Attempt all questions.
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3. Section A contains 05 Questions. Each question carries 1 Marks.
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Section – A

05X1= 5 Marks

1. Which measuring instruments can be used to measure internal diameter of 20.015 mm?

   Ans. Hole test Micrometer

2. Which one of the example of form gauge?

   Ans. Feeler gauge

3. Which one of the following is not a part of a micrometer?

   Ans:- Probe

4. Teeth are parallel to axis of shaft in

   Ans Spur gear

5. Flat belts are used in?

   Ans. Belt conveyor

Section- B

02X3= 6 Marks

6. What is the difference between accuracy and precision?

Ans. Accuracy is how close a measured value is to the actual (true) value.

Precision is how close the measured values are to each other.

7. Explain any two conditions for using studs.

Ans:- (1) one of the parts is thick enough to accommodate threaded hole.

(2) The material of the part with threaded hole Hs sufficient strength to ensure durable thread.

(3) the part which required frequently assembly and dismantling.

Registration No.: .....

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

Ans:- (1) Tolerances of given size.

(2) Range of given dimension.

(3) Availability of measuring instruments.

(4) Time consumption in measurements.

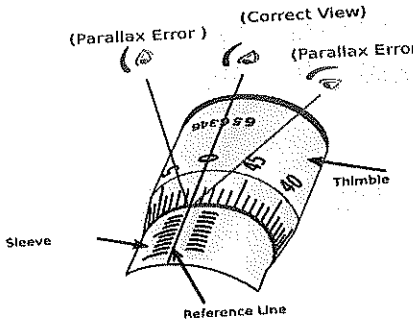
Section- C **03X3= 9 Marks**

9. Explain different types of errors in measurement.

Ans:- Error - it is the difference between measured value and true value

Types of Error

A. **Parallax Error** –Parallax error is the shift in apparent position of an object due to different viewing position. When we have to take reading from an instrument or do some measurements then different viewing position will give different readings leading to an error. This could be removed by keeping our eyes in front of the thing to be viewed.



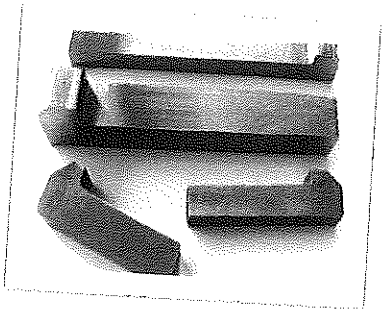
B. **Tilt Error** - This error occurs due to having play between slider and beam. When we applied excessive force on slider to clamp the work piece then slider may displace from it's original position this lead to error in measuring instruments. To avoid this error, we should apply limited force on jaws.

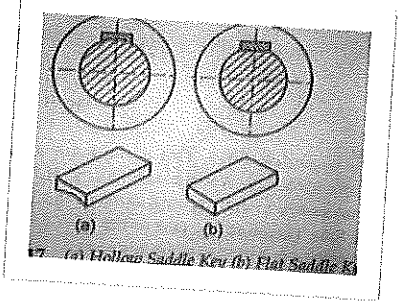
C. **Cocking Error**- when we measure the distance between reference face and measuring face of the work piece or measuring instruments then the reference faces and measuring faces of workpiece and measuring instrument should be parallel if it is not then it will show wrong value.

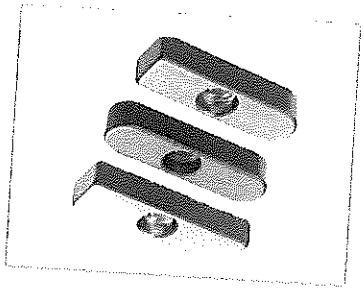
D. **Dirt or Burrs Error** –it is caused by dirt and burr on the work piece and measuring instruments.

10. Describe any three types of keys with diagrams.

Ans:-

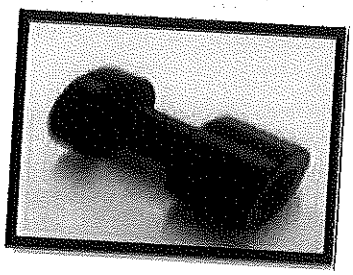


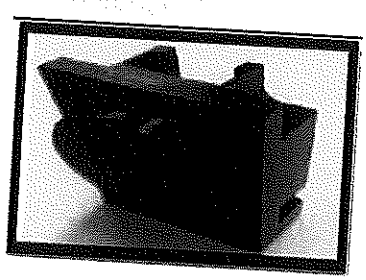


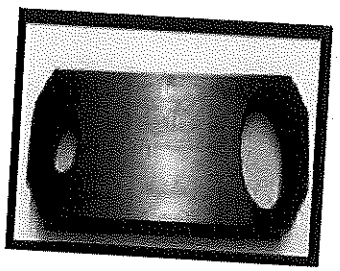


Sunk Key	**Saddle key**	**Feather Key**
A sunk key is a key in which half the thickness of the key fits into the keyway on the shaft and the remaining half in the keyway on the hub. A *parallel key* is the sunk key which is uniform in width as well as height throughout the length of the key	A saddle 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.	A parallel key which is either fixed to the shaft or to the hub and which permits relative axial movement between them

11. Write the name following Assembly parts:







Screw	**Shifting Casing**	**Shackle**
It is used to set the vertical alignment of shaft in assembly	It is having a guide way for guide screw	It is a link which connect the fork joint with guide bolt.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1102 **Time: 1 Hour**

Course Name: Hand Skill **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 05 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 **01X5= 5 Marks**

1. 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
2. What is the application of the anvil plate?
   a) To support the work piece for scribing
   b) To use as a base plate
   c) To measure the angle
   d) None of the above
3. Which one is not a part of file?
   a) Face length
   b) Tang
   c) Bow
   d) Handle
4. Point angle of a twist drill is (degree)?
   a) 45
   b) 115
   c) 118
   d) 90
   e) None of the above

Registration No.: .....

5. Jaw protectors can be made of?
    a) Plastic
    b) High speed steel
    c) ceramics
    d) None of the above

Section- B **02X3= 6 Marks**

6. Write the types of saw cut with figures.
7. What do you understand by TPI?
8. Which working rules must be observed while sawing?

Section- C **03X3= 9 Marks**

9. Write the formula of cutting speed .Also define its nomenclature with its unit. If cutting speed is 70 m/min and tool diameter is 5.5 mm then calculate the RPM.
10. Describe free cutting in sawing. Explain various types of saw blades on the basis of free cutting with the help of diagrams.
11. Write short notes on the following:
    a) Reaming b) scribing c) Reference plane d) Circular saw

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1102 **Time: 1 Hour**

Course Name: Hand Skill **Max. Marks: 20**

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5. Section C contains 03 Questions. Each question carries 3 Marks.

Section- A **01X5= 5 Marks**

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

Ans. a

2. What is the application of the anvil plate?

Ans. b

3. Which one is not a part of file?

Ans. b

4. Point angle of a twist drill is (degree)?

Ans. c

5. Jaw protectors can be made of?

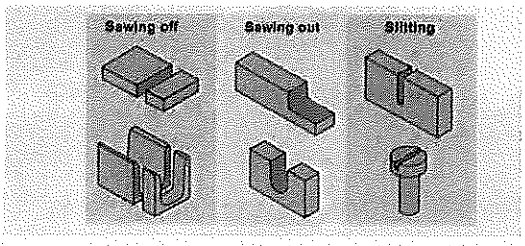
Ans. a

Section- B **02X3= 6 Marks**

6. Write the types of saw cut with figures.

Ans.

There are three types of saw cuts –

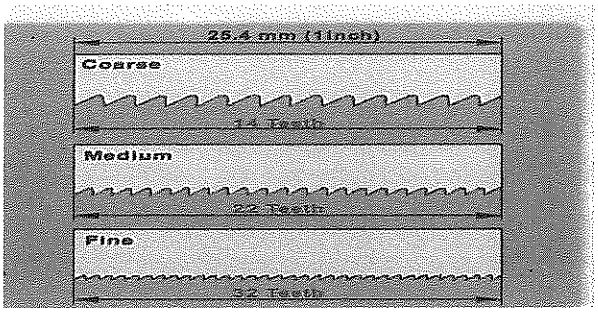


7. What do you understand by TPI.

Ans.

TPI stands for teeth per inch.

The teeth-per-inch has one of the biggest influences on cutting ability. Lower TPI are typically for softer materials, and Moderate TPI are for harder materials. And higher TPI are for the tubing or thin walled.



8. Which working rules must be observed when sawing?

Ans.

- choose suitable TPI saw blade according to work piece material
- saw blade must be tight properly
- scribing lines should be visible
- Before start the sawing, a notch must be made to guide the saw blade.
- Use light pressure. Start slow at the back edge of the work piece (in so doing, the saw is inclined slightly (about 10 degree).
- Don't twist the blade. Keep it perpendicular to your work.

Section- C **03X3= 9 Marks**

9. Write the formula of cutting speed .Also 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

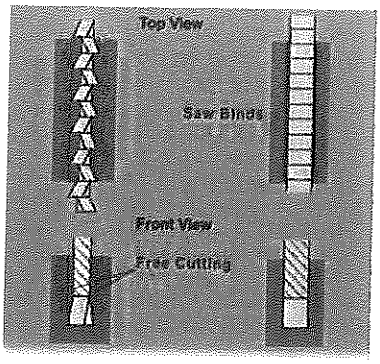
With this formula, $70 = 3.14 \times 5.5 \times N / 1000$

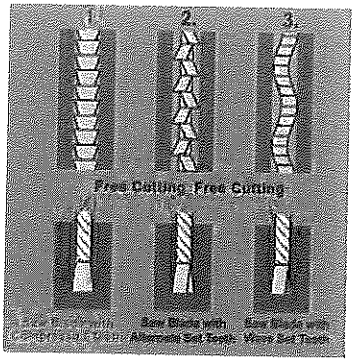
N = 4053 rev/min

10. Describe free cutting in sawing. Explain various types of saw blades on the basis of free cutting 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.





11. Write the short notes on following:

a) Reaming b) scribing c) Reference plane d) Circular saw

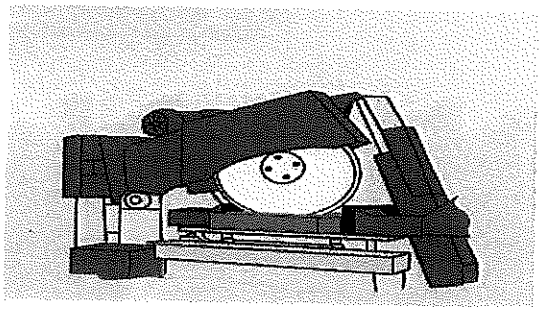
Ans.

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

b) Scribing- Scribing refers to the transferring the contours and dimensions onto the wok piece to be processed.

c) Reference plane-Reference plane is the plane on the behalf of it, all the drawing dimensions are measured. The point at which two reference plane intersect, is called reference point.

d) Circular saw- The circular saw blade cuts with an uninterrupted circular motion.
Due to their high cutting performance, circular saw are used especially in high volume production.



Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1103 **Time: 1 Hour**

Course Name: Conventional Milling **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 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 **05X1= 5 Marks**

1. Which type of wear is caused due to fluctuations in temperature?
   a) Edge fractures
   b) Thermal cracks
   c) Edge build -up
   d) Chips & splinters

2. Which tool holder is used for clamping Morse taper tool?
   a) Collet type tool holder
   b) Reducing bushes
   c) Weldon type tool holder
   d) Arbor type tool holder

3. Type 'H' milling cutters are used to cut which of the following materials.
   a) Soft & stringy
   b) Hard & tough

4. What is the range for V_c on mild steel work piece with HSS cutter?
   a) 25-30
   b) 400-500
   c) 100-120
   d) 80-100

Registration No.: .....

5. During Rough Milling, high Cutting Forces arise. Here axial and radial angle must be:
   a) Positive
   b) Negative

Section- B **02X3= 6 Marks**

6. Which is the coolant used in our workshop as a cutting oil? Write any 3 uses of Cutting Oil.
7. Describe the Steps to calculate R.P.M for ⌀63 Face mill with V_c= 450 and also calculate its Feed Rate with feed per tooth 0.15.
8. Define: -
   a) Hobbing
   b) Helix angle

Section- C **03X3= 9 Marks**

9. Explain any three types of wear to the following:
   a) Flank wear
   b) Thermal cracks
   c) Edge fracture
   d) Crater wear
10. Explain the following: -
    a) Types of Tool Holders with their applications.
    b) Copy milling machine
11. What is Milling? Explain types of Milling? (on the basis of relation between cutting & feed motion.)

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

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Course Name: Conventional Milling **Time: 1 Hour**

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Section – A

05X1= 5 Marks

1. Which type of wear is caused due to fluctuations in temperature? **1 mark**

   (d)Chips & splinters

2. Which tool holder is used for clamping Morse taper tool? **1 mark**

   (b)Reducing bushes

3. Type 'H' milling cutters are used to cut which of the following materials. **1 mark**

   (b)Hard & tough

4. What is the range for V_c on mild steel work piece with HSS cutter? **1 mark**

   (a)25-30

5. During Rough Milling, high Cutting Forces arise. Here axial and radial rake angle must be:

   (b)Negative

   1 mark

Section- B

02X3= 6 Marks

6. Which is the coolant used in our workshop as a cutting oil. Write any 3 uses of Cutting Oil.

   Ans. Blaser vasco 5000 **2 marks**

   a) **Heat dissipation**
   b) **Reduce tool wear**
   c) **Increase surface finish**
   d) **As a lubricant**

7. Describe the Steps to calculate R.P.M for ⌀63 Face mill with V_c= 450 and also calculate its Feed Rate with feed per tooth 0.15.

2 marks

Ans. We know that

For R.P.M. $V_c = \pi \times D \times N / 1000$ m/min

$450 = 3.14 \times 63 \times n / 1000$ m/min

$N = 1000 \times 450 / 3.14 \times 63$ m/min

$N = 2274$ min^{-1}

For feed rate $V_f = F_z \times z \times N$

$V_f = 0.15 \times 6 \times 2274$

$V_f = 2046$ mm/min

2 marks

8. Define: -

a) Hobbing: - **Hobbing is a machining process for gear cutting, on a hobbing machine, which is special type of milling machine.**

b) Helix angle: - **A helix angle is the angle between any helix and an axial line on its right.**

Section- C **03X3= 9 Marks**

3 marks

9. Explain any three types of wear to the following:

a) Flank wear: - **Flank wear is the most common type of wear on the cutting edges of the milling cutters it is caused by the friction between the tool flank and the work piece.**

b) 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**

c) Edge fracture: **-if indexable cutter inserts of insufficient strength are used, edge fracture result from the impact stress that develops**

d) 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 marks

10. Explain the following: -

a) Name the types of Tool Holders with their applications.

Ans. 1. collet type tool holder: - used for finishing tool & edge finder.

2. Weldon type tool holder: -used for roughing tool.

3. reducing bushes: -used for Morse taper shank tool.

4. arbor type tool holder: - used for tools which have no shank.

b) Copy milling machine: - **in this kind milling machine we use a template, which is placed in side of the machine and a tracer wheel, trace all the profile of this template. and the same profile path is followed by the tool. This type of milling machines are used for mass production.**

11. What is Milling? Explain types of Milling? (on the basis of relation between cutting & feed motion.)

3 marks

Ans. Milling is a material removal process in which tool is rotate & work piece remain stationary. In this we used multipoint cutting edges tool & they have geometrically define cutting edges.

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.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1104 **Time: 1 Hour**

Course Name: Conv. Turning **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 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

05X01 = 05 Marks

1. In Taper Operation, which type of surface is produced?
   a) flat
   b) curve
   c) circular
   d) None of the mentioned

2. What is the necessary condition for Turning?
   a) Material of work piece should be harder than the cutting tool.
   b) Cutting tool should be harder than the material of work piece.
   c) Hardness of the cutting tool and material of the piece should be same.
   d) None of the above

3. Which type of feed is needed in facing operation?
   a) longitudinal
   b) cross
   c) both cross and longitudinal
   d) none of the above

Registration No.: .....

4. Why do we make undercut for making thread?
   a) Thread tool relaxation & Self-looking.
   b) To clean the face
   c) To reduce the diameter
   d) None of the above

5. The function of Taper Turning process is to _____
   a) Reduce the diameter of a work piece along its length
   b) Reduce the diameter by removing material about an axis offset from the axis of work piece.
   c) Remove the material from end surface of a work piece
   d) All of the above

Section – B

03X02 = 06 Marks

6. What is Turning?

7. What possibilities are available for producing short broken chips?

8. Why are large chips undesirable when turning?

Section – C

03X03 = 09 Marks

9. Explain following:

   a) Thread depth of a thread with its formula.
   b) SNMG insert designation.
   c) Different types of angles of a cutting tool.

10. Explain at least 6 major components of lathe machine.

11. Explain the following:

   a) Minor diameter of a thread with its formula.
   b) Centering of a tools on lathe before machining.
   c) Two differences between 1st angle of projection and 3rd angle of projection.

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1104

Course Name: CONV. TURNING

Time: 60 Minutes

Max. Marks: 20

Section – A

1. In Taper Operation, which type of surface is produced? 1 Mark

Ans. (d) none of the above

2. What is the necessary condition for Turning? 1 Mark

Ans. (b) Cutting tool should be harder than the material of work piece.

3. Which type of feed is needed in facing operation? 1 Mark

Ans. (c) cross

4. Why we make undercut in thread? 1 Mark

Ans. (a) Thread tool relaxation & Self-looking.

5. The function of Taper Turning process is to _____ 1 Mark

Ans. (a) Reduce the diameter of a work piece along its length

Section – B

6. What is Turning? 0.66X3= 2 Marks

Ans. Turning is a material removal process in which material is removed from a rotating cylindrical work piece.

7. What possibilities are available for producing short broken chips? 2 Marks

Ans. Use of indexable inserts with chip breakers which result in a more favorable chipping process.

Increasing the federate.

8. Why are large chips undesirable when Turning? 2 Marks

Ans. Large chips result in a large chip volume and are difficult to remove from the machine working space. They obstruct the tool and can lead to work piece surface damage.

Section – C

9. Explain - 1X3= 3Marks

(a) Thread depth of a thread with its formula

(b) SNMG insert designation

(c) Different types of angles of a cutting tool.

Ans. (a). Thread depth = 0.614 × pitch

Pitch- Distance between two consecutive threads

(b). S- Shape

N- Clearance

M- Tolerance

G- Top Suface

(c). Rake Angle

Clearance Angle

Wedge Angle

10. Explain at least 6 components of lathe machine. 0.5X6= 3Marks

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.

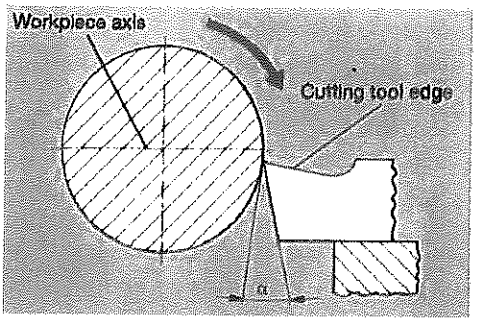
6.) Compound Slide- The adjustable top slide carries the tool post or tool rest. For precise movement we can use compound slide.

11. Why do we do centering of turning tools before machining? 1X3= 3Marks

Ans.

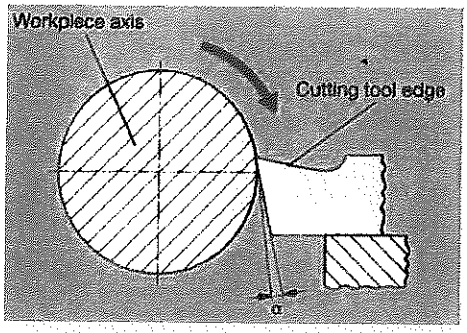
a) Minor Dia. Of Thread

b) Centering of a tool

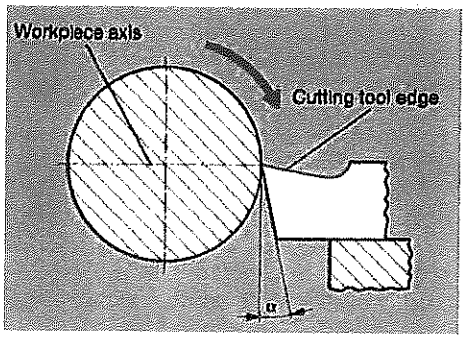


Positioning the tool below the midpoint of the workpiece increases the clearance angle and reducesthe rake angle,the tool will catch and cause an uneven surface to be produced.

Positioning the tool above the midpoint of the work piece reduces the clearnace angle and increases the rake angle, the lathe tool will dig in.

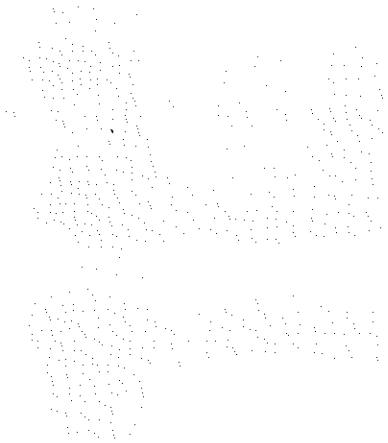


Optimum machining is only possible when the lathe tool is accurately aligned to the midpoint of the work piece, as the clearance and Rake angles are then in the correct relationship to the work piece.



c) 1st angle and 3rd angle

- In 1st angle object is placed in 1st quadrant and in 3rd angle object s placed in 3rd quadrant
- In 1st angle te object is in between the observer and plane of projection and in 3rd angle between observer and object.



Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

3rd Semester, 2nd In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: SMS1301 **Time: 1 Hour**

Course Name: CNC Milling & Programming **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 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

05X01 = 05 Marks

1. 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

2. Touch probe is used for:
   a) To Calibrate the X axis
   b) To Calibrate the Y axis
   c) To calibrate the Z axis
   d) To take zero reference in Z direction

3. What is the work of ATC?
   a) Automatic Tool Controlling
   b) Automatic tool changing
   c) Automatic turret controlling
   d) None of the above

Registration No.: .....

4. G03 is named as:
   a) Linear interpolation
   b) Circular Interpolation Anti-clockwise
   c) Circular Interpolation clockwise
   d) None of the above

5. Which operation cannot be performed on Vertical Milling Machine?
   a) Facing
   b) Drilling
   c) Tapping
   d) None of the above

Section – B

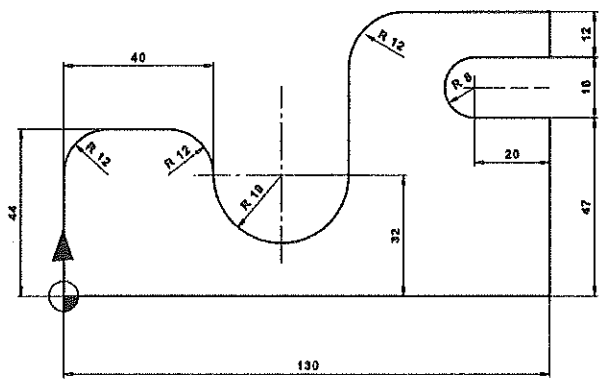
03X02 = 06 Marks

6. What do you mean by 'controller' in CNC, please write the name of any controller?
7. Calculate the Spindle RPM and Feed in mm/min for the given data:
   Tool- Facemill dia. 40 with 4 insert
   Vc= 400 m/min
   Feed per tooth= 0.1 mm/rev.
8. What is the difference between Face Mill and End Mill?

Section – C

03X03 = 09 Marks

9. Write a program for the given drawing.
   Total Depth: 5 mm
   Depth of Cut: 0.5 mm



10. What do you mean by machine setup, explain it in detail?
11. Write the differences between NC machine and CNC machine.