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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 1st 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 Marks.
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. When there is a heavy thrust load, we use-
   a) Ball Bearing
   b) Roller Bearing
   c) Self-Aligning Bearing
   d) Roller Thrust Bearing
2. Visual inspection is a type of:
   a) Subjective measurement.
   b) Sensory measurement.
   c) Both subjective and sensory.
   d) None of the above.
3. Thin annular shaped metal disk is called-
   a) Nut
   b) Washer
   c) Stud
   d) Bolt
4. Accuracy of standards to calibrate a measuring instrument should be...
   a) 1/10th of least count of measuring instrument.
   b) Less than 1/10th of least count of measuring instrument.
   c) More than 1/10th of least count of measuring instrument.
   d) Maximum 1/10th of least count of measuring instrument.

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5. When there is some misalignment between axis of shaft and housing, we use-
   a) Ball bearing
   b) Roller bearing
   c) Self-aligning bearing
   d) Deep groove ball bearing

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

6. Calculate least count of Hole test micrometer.
7. Define repeatability?
8. Define Clutch.

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

9. Explain any three advantages of deep groove ball bearing.
10. Write any 5 precautions for the use of slip gauge.
11. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale and also write its formula.

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 1st In-Sem. Examination

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

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

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

Section- A

1. When there is a heavy thrust load, we use- 1 Mark
   - Roller Thrust Bearing

2. Visual inspection is a type of: 1 Mark
   - Both subjective and sensory.

3. Thin annular shaped metal disk is called- 1 Mark
   - Washer

4. Accuracy of standards to calibrate a measuring instrument should be... 1 Mark
   - More than 1/10th of least count of measuring instrument.

5. When there is some misalignment between axis of shaft and housing, we use- 1 Mark
   - Self-aligning bearing

Section- B

1. Calculate least count of Hole test micrometer. 2 Marks
   - Least Count= Value of one division on main scale/ Total no. of division on Secondary scale.
     = 0.5/100 = 0.005mm
2. Define repeatability? 2 Marks
   - It is the closeness of agreement between repeated measurement of the same thing carried out in the same place by the same person on same equipment in same way at similar time.
3. Define Clutch. 2 Marks
   - Clutch is a mechanical device which is used to connect and disconnect the driven and driving members at the will of operator

Section- C

4. Explain any three advantages of deep groove ball bearing. 1X3=3 Marks

- Relatively large size of balls, these bearings have high load carrying capacity.
- Due to point contact between the balls and races, frictional loss and temperature rise is less.
- Generate less noise due to point contact.

5. Write any four precautions for the use of slip gauge. 0.75X4=3 Mark

- Slip gauges should be cleaned before use.
- Slip gauges should not be assembled for long time otherwise they can become cold welded
- Never drop slip gauges on any hard surface to prevent damage.
- Never hold slip gauges in hands for long time.

6. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula. 1.5X2=3 Mark

- Formula:

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

OR

L.C = Main scale division – Vernier scale division

Calculate least count:

L.C = 1 / 50 = 0.02mm

Or

L.C = 1 – 0.98 = 0.02mm

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School of Manufacturing Skills

1st Semester, 1st In-Sem. Examination

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

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

Course Name: Handskills **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. What would be the 'tap depth' formula for 'Through-out Tap' if thickness of work piece is H and tap diameter is d?
   a) H+0.5d+3
   b) H+0.7d+3
   c) H+0.7d+0.3d+3
   d) H+0.3d+3
2. 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
3. For in 'straight cut' and 'curved cut' configuration, which one has better chip evacuation in case of filling?
   a) Both straight cut and curved cut
   b) Curved cut
   c) Straight cut
   d) None of the above
4. For which Material negative rake angle is used?
   a) Soft material
   b) Hard Material
   c) Both
   d) None of these

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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

03X02 = 06 Marks

6. What will happen if the size of relief angle is decreased?
7. Describe the free cutting in sawing. Classify 3 types of Saw Blade using sketch.
8. Differentiate between the 'cut file' and 'milled file'.

Section – C

03X03 = 09 Marks

9. Derive the formula to calculate the chamfer value for Radius 'R' with diagram.
10. Explain occupational safety r=that should be considered during sawing?
11. Write short notes on following;
    a) Drilling b) Reaming c) Tapping d) Counter sinking

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 1st In-Sem. Examination

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

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

Course Name: Handskills **Max. Marks: 20**

Instruction:

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

Section – A

1. What would be the 'tap depth' formula for 'Throuhout Tap' if thickness of work piece is H and tap diameter is d? 1 Mark

a) H+0.5d+3
b) H+0.7d+3
c) H+0.7d+0.3d+3
d) H+0.3d+3

Ans. a.

2. What would be the procedure for reaming process? 1 Mark

a) Drill – core drill – reamer
b) Spot drill – drill – csk – reamer
c) Spot drill – drill – csk – core drill – reamer
d) None of the above

Ans. c.

3. For In 'straight cut' and 'curved cut' configuration, which one has better chip evacuation? 1 Mark

a) Both straight cut and curved cut
b) Curved cut
c) Straight cut
d) None of the above

Ans. b.

4. For which Material negative rake angle is used? 1 Mark

a) Soft material
b) Hard Material
c) Both
d) None of these

Ans. b.

5. None of the above what will be the sum of wedge angle, relief angle and rake angle? 1 Mark

a) Less than 90°
b) More than 90°
c) Equal to 90°
d) None of the above

Ans. c.

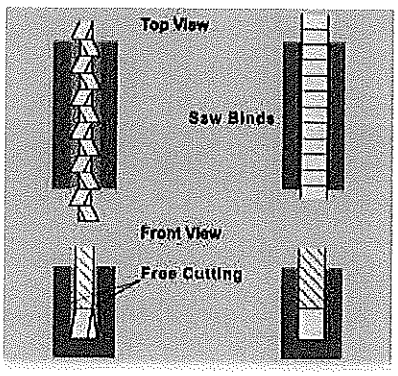
Section – B

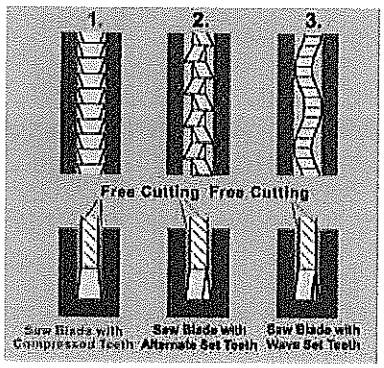
6. What will happen if the size of relief angle is decreased? 1 Mark

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. Describe the free cutting in sawing. Classify 3 types of Saw Blade using sketch.

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

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

Ans.

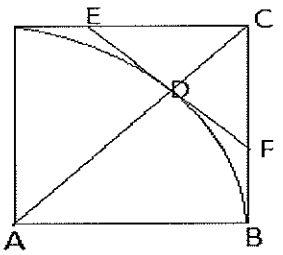
Cut file – cut files are made by chiseling notches into the file face. This results in a file with a negative rake angle and a scraping effect. Therefore, cut files are preferred for hard materials.
Milled file – milled files are made by milling the cutting edge into the file face. Files with milled teeth have a positive rake angle, and therefore cut better than cut files. Milled files are especially suited for use on soft material

Section – C

03X03 = 09 Marks

9. Derive the formula to calculate the chamfer value 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

10. Explain 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.

Deburr the work piece after sawing

11. Write short note on 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 a conical shape at the entrance of the hole.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 1st 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. What is the use of rake angle in a tool?
   a) Chips removal
   b) Provide space between work piece and tool
   c) To give relief
   d) None of these

2. What is the full form of DRO?
   a) Digital run out
   b) Direct reading out
   c) Digital read out
   d) Distance read out

3. 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

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4. Why 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. Which of the following is the correct formula for cutting speed?

   a) Vc = $\frac{\pi dn}{1000}$ cm/min
   b) Vc = $\frac{\pi dn}{1000}$ mm/min
   c) Vc = $\frac{\pi dn}{1000}$ m/min
   d) Vc = $\frac{\pi dn}{1000}$ $m/sec.$

Section – B

03X02 = 06 Marks

6. Name different types of chips formed while cutting.

7. Under which condition tear chips can be formed?

8. Why do we use coolant?

Section – C

03X03 = 09 Marks

9. For thread M 16X2, calculate: -

   (a) Thread depth

   (b) Required chamfer

   (c) Minor diameter

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

11. Why do we do centering of cutting tools on lathe before machining?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

1st Semester, 1st In-Sem. or End-Sem. Examination

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

Course Code: SMS1104 **Time: 60 Minutes**

Course Name: CONV. TURNING **Max. Marks: 20**

Section – A

1. What is the use of rake angle in a tool? 1 Mark

Ans. (A) Chip removal

2. What is the full form of DRO? 1 Mark

Ans. (C) Digital read out.

3. What is the formula for minimum depth of cut? 1 Mark

Ans. (D) 2/3rd of Nose radius.

4. Why we make undercut in thread? 1 Mark

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

5. Which of the following is the correct answer? 1 Mark

Ans. (C) $Vc = \frac{\pi dn}{1000}\ m/min$

Section – B

6. Name different types of chips formed while cutting. 0.66X3= 2 Marks

Ans. 1. Tear Chips

2. Continuous chips

3. Shear chips.

7. Under which condition tear chips can be formed? 2 Marks

Ans. Tear chips mainly results from rough working, when using a large depth of cut, low cutting speed and a large rate of feed.

8. Why do we use coolant? 2 Marks

Ans. Cooling lubricant are used:

1) to increase tool life
2) to improve the surface finish of the work piece
3) To reduce the surface temperature of the work piece.

Section – C

9. For thread M 16X2, calculate: - 1X3= 3Marks

(a) Thread depth

(b) Required chamfer

(c) Minor diameter

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

= 0.614 × 2

= 1.228 mm (radially)

Thread depth (diametrically) = 2 × 1.228

= 2.456 mm

(b). Required Chamfer = $\frac{major\ dia.-minor\ dia.}{2} + 0.5$

$= \frac{15.8-13.3}{2} + 0.5$

= 2 mm (approx.)

(c). Minor diameter = major dia. – thread depth

= 15.8 – 2.5

= 13.3 mm

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.

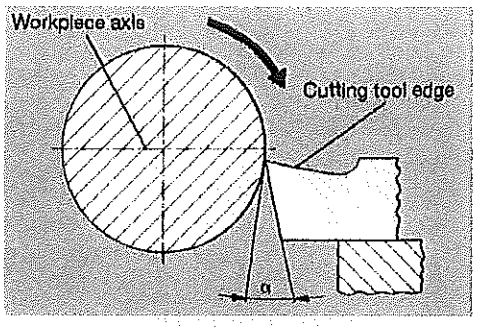
4.) Saddle- The longitudinal slide runs on the guide ways of the lathe bed. It can move by hand or through lead screw or feed shaft.

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

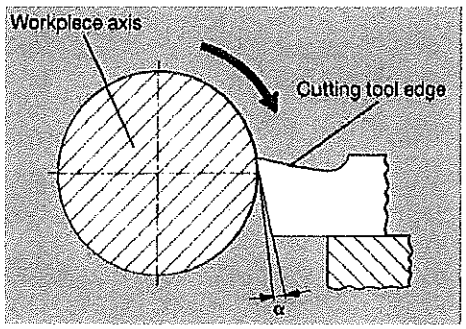
6.) Compound Slide- The adjustable top slide carries the tool post or tool rest. For precise movement we can use compound slide.

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

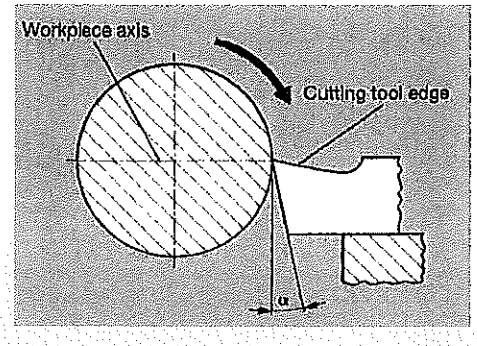
Ans.



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.