BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, I Semester,

1st In-Sem. Examination

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

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

Instruction:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 1 Mark.
3. Section B contains 03 Questions. Each question carries 2 Marks.
4. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

1. Standard Temperature for measurement is:
   a) 25^0 C
   b) 20^0 C
   c) 18^0 C
   d) None of the above.
2. Sensory inspection is a type of:
   a) Subjective measurement
   b) Objective measurement
   c) A & B Both
   d) None of the above
3. For which applications plunger dial indicator not used?
   a) Inspecting surface for flatness.
   b) Aligning work piece.
   c) Inspecting shaft roundness.
   d) Measuring boring diameter.
4. Which one of the following is not a part of a micrometer?
   a) Thimble
   b) Spindle
   c) Probe
   d) Anvil
5. Which measuring instrument can be used to measure internal diameter of 20.015 mm?
   a) Digital Vernier calipers
   b) Micrometer.
   c) Hole test Micrometer
   d) Plug gauge

Section – B

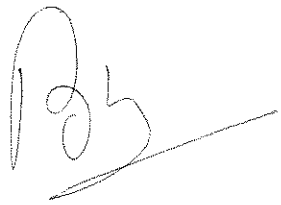
03X02 = 06 Marks

6. Write down the different parts of micrometer with their application.
7. Explain the Bevel protractor with its parts name.
8. Which factors should we consider to select measuring tool.

Section – C

03X03 = 09 Marks

9. Explain different types of errors in measurement.
10. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale and also write its formula.
11. Write any 4 Safety precautions while using slip gauge.



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Answer Key

Section – A

05X01 = 05 Marks

1. Standard Temperature for measurement is::
   - a) 25^0 C
   - **b) 20^0 C**
   - c) 18^0 C
   - d) None of the above.
2. Sensory inspection is a type of:
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   - c) A & B Both
   - d) None of the above
3. For which applications plunger dial indicator not used:
   - a) Inspecting surface for flatness.
   - b) Aligning work piece.
   - c) Inspecting shaft roundness
   - d) **Measuring boring diameter.**
4. Which one of the following is not a part of a micrometer?
   - **a)** Thimble
   - **b)** Spindle
   - **c) Probe**
   - **d)** Anvil
5. Which measuring instrument can be used to measure internal diameter of 20.015 mm?
   - **a)** Digital Vernier calipers
   - **b)** Micrometer.
   - **c) Hole test Micrometer**
   - **d)** Plug gauge

Section – B

03X02 = 06 Marks

6. Write down the different parts of micrometer with their application.

Ans. **Ratchet**-used to apply constant and limited measuring force and also used for fine movement.

Thermal insulation pad- does not allow transferring the body heat to micrometer.

Anvil and spindle- Anvil used to support the work piece and create reference face and spindle create measuring face, it consists linear and rotational motion.

Measuring scale- works on the pitch principle or can be defined as one rotation of circular scale gives one division linear movement on main scale.

Frame - it is required for providing support to all components of micrometer.

7. Explain the Bevel protractor with its parts name.

Ans. It is used to measure the angle of mechanical parts

PARTS

1. Main scale
2. Solid beam
3. Adjustable measurement beam
4. Clamp screw
5. Secondary scale

Lest count

Value of one division on mane scale /total number of division on secondary scale

1/12=60'/12=5'

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

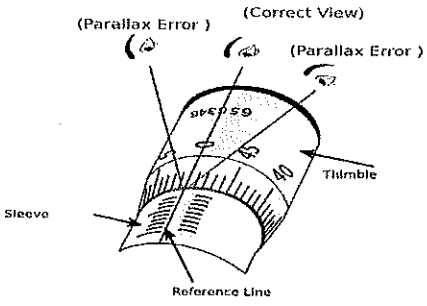
03X03 = 09 Marks

9. Explain different types of errors in measurement.

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 workpiece 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 work piece 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. Calculate the least count of Vernier caliper which has 50 divisions on secondary scale and also write its formula.

Ans:- **Formula:**

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

OR

L.C = Main scale division – Vernier scale division

Calculate least count:

L.C = 1 / 50 = 0.02mm

Or

L.C = 1 – 0.98 = 0.02mm

11. Write any 4 Safety precautions while using slip gauge.

Ans.

1. It should not be fallen down, even not on the soft floor.
2. Clean the measuring surface before measuring.
3. After use apply Vaseline on measuring surface.
4. Take out only blocks which is to be used.

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School of Manufacturing Skills

Session 2021-22 (Winter Semester)

B. Voc. Program, I Semester

1st In-Sem. Examination

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

Course Name: Handskills **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 **01X5= 5 Marks**

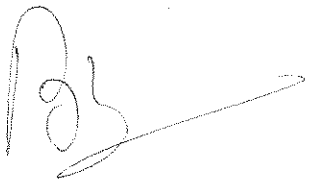
1. The process to enlarge a hole with high accuracy and surface finishing is called:
   a) Tapping
   b) Reaming
   c) Counter Boring
   d) Counter Sinking
2. The drill bit has the point angle
   a) 120°
   b) 18°
   c) 118°
   d) 90°
3. Templates are used for.
   a) To scribe the work-piece with complex contours
   b) For mass production
   c) Both A & B
   d) None of the above
4. Point angle of a center punch is?
   a) 45°
   b) 115°
   c) 118°
   d) 90°
5. The penetration of the cutting wedge does not depend on the following.
   a) Wedge angle
   b) Cutting force
   c) Relief angle
   d) Workpiece Material

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

6. Write the difference between the cut file and milled files.
7. Write the properties of the granite surface plate.
8. Write the rules and techniques for filing.

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

9. What are the working rules and techniques for sawing?
10. Explain the geometry of the cutting tool with diagram.
11. Explain the following process
    a. Drilling
    b. Reaming
    c. Tapping
    d. Counter Boring



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School of Manufacturing Skills

Session 2021-22 (Winter Semester)

B. Voc. Program, I Semester

1st In-Sem. Examination

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

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

Answer Key

Section – A

05X01 = 05 Marks

1. The process to enlarge a hole with high accuracy and surface finishing is called:
    a) Tapping
    b) Reaming
    c) Counter Boring
    d) Counter Sinking

Ans. b

2. The drill bit has the point angle
    a) 120°
    b) 18°
    c) 118°
    d) 90°

Ans. c

3. Templates are used for.
    a) To scribe the work-piece with complex contours
    b) For mass production
    c) Both A & B
    d) None of the above

Ans. c.

4. Point angle of a center punch is?
    a) 45°
    b) 115°
    c) 118°
    d) 90°
    e) None of the above

Ans. d.

5. The penetration of the cutting wedge does not depend on the following?
    a) Wedge angle
    b) Cutting force
    c) Relief angle
    d) Workpiece Material

Ans. c.

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Section – B

03X02 = 06 Marks

6. Write the difference between the cut file and milled files.

Ans.

Cut Files	Milled Files
Cut files are made by the chiselling notches into the file face.	Milled file are made by Milling into the file face.
These files have the negative rake angle and a scrapping effect.	These files have positive rake angle.
The large wedge angle makes for a stable cutting edge.	They cut better than the cut files.
Cut files are prepared for the hard material. Such as cast iron, steel etc.	Suitable for the soft material such as aluminium, copper and plastic
In the cut files the chip evacuation is worse than milled file	Better chip evacuation compare to cut files.

7. Write the properties of the granite surface plate.

Ans. Granite surface plates are best known due to their rustles properties. Granite surface plates remain unaffected by the change in temperature and Heat as well so hence it can maintain the flatness for a longer period of time. The hardness of the granite surface plates is more than the C. I Surface Plates.

8. Write the rules and techniques for filing

Answer:

1. Clamp the workpiece straight in the vice
2. 70% portion of the workpiece should be clamped in the vice
3. File should be hold properly
4. The posture and gesture should be proper
5. Exert the pressure in the forward direction only.

Section – C

03X03 = 09 Marks

9. What are the working rules and techniques for sawing?

Ans.

working rules and techniques for sawing

- Scribing should be accurate (with an allowance of 1-2 mm for finishing) and visible.
- Work-piece should be tightly clamped.
- Saw blade clamping (teeth should be in forward direction).
- Check saw blade tension. it must be tight and having proper TPI.
- Posture and gesture should be proper.

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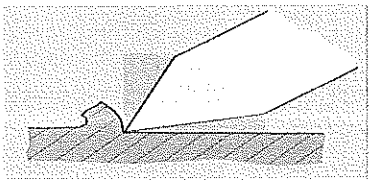
- Make a notch by triangular file to guide the saw blade.
- Start sawing slowly with a light pressure at an angle of approx. 15 degrees.
- Slowly-2 increase the pressure and reduce the angle, make the saw straight.
- Consistent pressure is applied to the saw on the forward stroke
- On the return stroke, the pressure is taken off so that the teeth don't become dull.
- Use the entire length of the saw blade results most effective and efficient sawing.
- Continue the cutting....by observing the scribing line.
- Problems found during the sawing and their trouble shooting.

10. Explain the geometry of the cutting tool with diagram.

Ans. Wedge angle(β)

Relief angle (α) * (α+β+γ)=90

Rake angle(γ)



Wedge angle-

The angle between the cutting face and the flank face is known as wedge angle. It is denoted by beta (β).

The size of the wedge angle influences the cutting force on the metal removal process.

Relief angle-

The angle between the flank and the machined surface.it is denoted by alpha α

The size of the relief angle affects the friction between the tool and the work piece and resulting surface of the work piece.

Rake angle-

The rake angle is the angle between the machined surface and a line perpendicular to the working face.

The size of the rake angle mainly influences the chip formation and also the cutting force.

11. 11. Explain the following process
    a. Drilling
    b. Reaming
    c. Tapping
    d. Counter Boring

Answer:

a. Drilling: drilling is a process to make a hole
b. Reaming: Reaming is a process to enlarge a hole with high accuracy and surface finishing
c. Tapping: Tapping is a process to make internal thread in the hole
d. Counter boring: Counter boring is a process to enlarge a hole with certain depth (not throughout).