

# 22450

**21222**

**3 Hours / 70 Marks**

Seat No.

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15 minutes extra for each hour

- Instructions* –
- (1) All Questions are *Compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) Define the term “metrology”.
  - b) List any four sources of errors in measurements.
  - c) State the need of comparator.
  - d) Define Quality.
  - e) State why relief holes are provided in sine bar ?
  - f) List any four alignment tests, performed on drilling machine tool.
  - g) Define :
    - (i) Primary texture
    - (ii) Secondary texture

P.T.O.

2. Attempt any THREE of the following: 12
- Differentiate between the terms “Precision and Accuracy”.
  - Compare line standard and end standards.
  - With the help of neat sketch, illustrate clearance and interference fits.
  - Compare hole basis system and shaft basis system.
3. Attempt any THREE of the following: 12
- State and explain Taylor’s principle of gauge design.
  - Explain the following terms related to metrology and give one example :
    - Selective assembly
    - Interchangeability
  - Explain process capability in detail.
  - Suggest the measuring instruments to measure the following features of external and internal threads :
    - Minor diameter
    - Effective diameter
    - Pitch
    - Thread angle
4. Attempt any THREE of the following: 12
- How major diameter is measured using floating carriage micrometer ?
  - “Sine bar does not use to measure the angle more than  $45^\circ$ ”. Justify.
  - Explain the working principle of ‘clinometer’ with neat sketch.
  - Explain the working principle of ‘angle dekkor’ with neat sketch.
  - An angle of  $33^\circ-9'-15''$  is to be measured with the help of the 13 pieces standard set of angle gauge. Show the arrangement of angle gauges with a neat sketch by selecting minimum number of gauges.  
[ $1^\circ$ ,  $3^\circ$ ,  $9^\circ$ ,  $27^\circ$ ,  $41^\circ$ ], [ $1'$ ,  $3'$ ,  $9'$ ,  $27'$ ], [ $3''$ ,  $6''$ ,  $18''$ ,  $30''$ ]  
and right angle block.

- 5. Attempt any TWO of the following:** **12**
- a) Write procedure to measure effective diameter of screw thread using two wire method.
  - b) Explain Taylor-Hobson-Talysurf with neat sketch.
  - c) Explain co-ordinate measuring machine with neat sketch.
- 6. Attempt any TWO of the following:** **12**
- a) Differentiate between Inspection and Quality Control with suitable examples.
  - b) Sketch 'OC' curve. Mark important parameter's on it. Justify use of AQL and LTPD in judging consumer's risk and producer's risk.
  - c) State the objectives of Quality Control.
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