

22342

21819

3 Hours / 70 Marks

Seat No.

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- 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 accuracy & precision.
 - (b) List different measuring standards.
 - (c) State the advantages of interchangeability. (atleast two)
 - (d) Define – Run out w.r.t. gear.
 - (e) State the use of “combination set”.
 - (f) List the causes of surface roughness.
 - (g) Define – RMS value.

2. **Attempt any THREE of the following :** **12**
 - (a) Explain parallax error with neat sketch.

- (b) Differentiate between mechanical and pneumatic comparator. (atleast four points)
- (c) Explain Hole basis system. State its significance in production.
- (d) Explain working principle of 'Tool Maker's' microscope.

3. Attempt any THREE of the following :

12

- (a) Explain
 - (i) Environmental error
 - (ii) Calibration error
- (b) Draw the diagram indicates a reading of 4.32 mm on vernier scale.
- (c) Explain brief construction & working of "sigma comparator".
- (d) Differentiate between Hole basis system and Shaft basis system. (atleast four points)

4. Attempt any THREE of the following :

12

- (a) Measure a distance of 6.905 mm with the help of slip gauges using 112 set of slip gauges. Show the arrangement with neat sketch.
- (b) A shaft of 25 ± 0.004 mm is to be checked by meance of GO and NOGO gauge. Design the dimensions of a gauge required.
- (c) Write the examples of use of following types of fits :
 - (i) Push fit
 - (ii) Press fit
 - (iii) Running fit
 - (iv) Wringing fit
- (d) An angle of $49^\circ 29' 18''$ is to be developed by using standard angle gauge set of 13 pieces. Calculate the gauges required and sketch the arrangement.
- (e) Explain procedure to determine whether the given surface is concave or convex by using optical flat.

5. Attempt any TWO of the following :**12**

- (a) Explain the working principle of “Floating carriage micrometer” with neat sketch.
- (b) Describe the procedure of measurement of tooth thickness using ‘Base Tangent Method’ with neat sketch.
- (c) In the measurement of surface roughness, height of 10 successive peaks and valleys were measured from a datum as
Peaks – 45, 42, 40, 30, 35 microns.
Valleys – 30, 25, 25, 24, 18 microns.
Determine the Ra value of the surface.
If these values are obtained over length of 20 mm, find CLA & RMS values.

6. Attempt any TWO of the following :**12**

- (a) Sketch and interpret the meaning of various interference fringes patterns observed using optical flat.
 - (b) The angle of taper plug gauge is to be checked using sine centre and slip gauges. Sketch the set-up and describe the procedure.
 - (c) Draw the following alignment test of Lathe Machine :
 - (i) Parallelism of tail stock
 - (ii) Run out of spindle
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