21819

3 Hours / 70 Marks Seat No. | | | | | | | | |

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° 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
