22342

12425

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.

Marks

1. Attempt any FIVE of the following : **10**

(a) List four objectives of Metrology.

(b) State any four advantages of Pneumatic comparator.

(c) State the term Interchangeability.

(d) Draw a neat sketch of Acme thread profile.

(e) State advantages and limitations of Linear Measuring instrument.

(f) List the causes of Surface Roughness.

(g) Define Primary texture and Secondary texture with respect to surface finish.

2. Attempt any THREE of the following : **12**

(a) Explain the difference between Random Errors and Systematic Errors.

(b) Discuss the characteristics of Line standards and End standards.

(c) Explain the term Selective Assembly with suitable example.

(d) Explain working principle of "Tool Makers" microscope.

3. Attempt any THREE of the following : **12**

(a) Define Metrology. Briefly discuss the categories of metrology.

(b) Differentiate between accuracy and precision with neat sketch.

(c) Write the examples of following types of fits :

(i) Push fit

(ii) Press fit

(iii) Running fit

(iv) Wringing fit

(d) Explain the working principle of Dial Indicator and enlist its application.

4. Attempt any THREE of the following : **12**

(a) Explain in brief construction and working of Sigma Comparator.

(b) Calculate the limits of tolerances and allowances for 25 mm Shaft and Hole pair designated H8d9.

(c) Explain "Taylor's Principle" of limits gauging. Can this principle be strictly followed in practice ? Justify.

(d) 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.

(e) Draw the alignment test of Squareness of Spindle of Radial Drilling Machine.

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

(a) Write procedure to measure Effective Diameter of screw thread using two wire method.

(b) Describe the procedure of measurement of tooth thickness using Parkinson's Gear tester with neat sketch.

(c) In the measurement of surface roughness heights of 20 successive peaks and troughs where measured from a date term and where 35, 25, 40, 22, 35, 18, 42, 25, 35, 22, 36, 18, 42, 22, 32, 21, 37, 18, 35, 20 microns. If these measurements were obtained over a length of 20 mm, determine the CLA and RMS value of the rough surface.

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

(a) An angle of 31° 49′ 24″ is to be developed by using standard angle gauge of 13 pieces. Calculate the gauges required and sketch the arrangement.

(b) Differentiate between angle gauges and slip gauges.

(c) Draw the following alignment test on lathe machine :

(i) True running of taper socket in main spindle

(ii) Parallelism of the main spindle to saddle movement
