22342

11920

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

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) 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) State various types of metrology.

(b) List four mechanical comparators. Draw labelled sketch of any one.

(c) Write Taylor's principle of gauge design.

(d) Explain errors in gear (i) Runout, (ii) Backlash.

(e) State the uses of Universal Bevel Protractor.

(f) Define primary and secondary texture w.r.t. surface finish.

(g) List the causes of surface roughness.

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

(a) Explain the need of inspection in manufacturing industry.

(b) Differentiate between line standard and end standard. (any four)

(c) Explain the meaning of $27H_5F_6$

(d) Describe the working principle of floating carriage micrometer with neat sketch.

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

(a) Differentiate between accuracy and precision.

(b) Ten divisions on the V.C. Scale coincide with smallest nine divisions on the main scale (mm), main scale reading is 2.6 cm and V.S. coincides with seven divisions of main scale (i) Calculate the least count of V.C., (ii) Calculate observed reading.

(c) Explain the working principle of mechanical comparator with neat sketch.

(d) Distinguish between Hole basis system and shaft basis system. (any four)

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

(a) Draw slip gauge accessories (any two) and describe the use of it.

(b) In a limit system, the following limits are specified to give a clearance fit between the shaft and hole.

Shaft : $30^{-0.005}_{-0.018}$ mm ϕ

Hole : $30^{+0.020}_{-0.000}$ mm ϕ

Determine (i) Basic size (ii) Shaft and hole tolerance (iii) Minimum and maximum clearance.

(c) Draw hole and shaft assembly and show (i) Limit (ii) Allowance (iii) Tolerance (iv) Deviation.

(d) An angle of 117° 8′ 42″ is to be developed using standard angle gauge set. Calculate the gauges required and show the arrangement.

(e) Draw the alignment test of squareness of spindle of radial drilling machine.

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

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

(b) Explain procedure of minor diameter measurement of screw thread using floating carriage micrometer with neat sketch.

(c) Draw symbol for designating surface finish on drawing.

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

(a) Describe stepwise procedure carried out in laboratory for small angle measurement with neat sketch.

(b) Differentiate between angle gauges and slip gauges (any four).

(c) Draw the following alignment test of lathe machine.

(i) True running of lathe main spindle

(ii) Run out of spindle.
