23242

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)   Explain the term :

(i)   Readability

(ii)   Sensitivity

(b)   Interpret the meaning of $25H_5F_6$ with respect to fit and basis system.

(c)   Draw neat sketch of metric screw thread profile.

(d)   List the four instruments used in angular measurement.

(e)   Define "Lay" with refer to surface finish and state its types.

(f)   Define comparator. List two mechanical comparators.

(g)   Draw surface finish symbol with its all parameters.

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

   (a) Difference between Line Standard & End Standards (at least four points).

   (b) Explain Hole basis system with sketch.

   (c) "Good quality jobs develops reputation of manufacturing". Justify.

   (d) What do you mean by primary and secondary texture ? Explain with sketch.

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

   (a) Explain how will you use sine bar to measure angle of component ?

   (b) Differentiate between comparator & measuring instruments (4 points).

   (c) What is Interchangeability ? State its needs in mass production.

   (d) Explain Taylor's principle of gauge design with neat sketch.

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

   (a) Draw a labelled diagram showing the mechanism of dial indicator.

   (b) State and explain any four types of errors in gears.

   (c) "Sine bar does not use to measure the angle more than 45°". Justify.

   (d) Differentiate between Angle gauges and Slip gauges (4 points).

   (e) Explain :

      (i) R_a

      (ii) R_z value for surface finish measurement with sketch.

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

(a) In the measurement of surface roughness heights of 20 successive peaks and troughs were measured from a datum and 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 (Ra) and RMS value of the rough surface.

(b) Explain Parkinson's Gear Tester (Gear Rolling Tester) with sketch.

(c) What is wringing of slip gauges ? Prepare 58.975 mm stack of slip gauges using following slip gauge set M112 :

Range (mm)	Steps (mm)	Pieces
1.001 to 1.009	0.001	9
1.01 to 1.49	0.01	49
0.5 to 24.5	0.5	49
25, 50, 75, 100	2.5	4
1.0005	–	1
	Total	**112**

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

(a) What is optical flat ? Explain working with ray diagram. Draw any four fringe pattern observed.

(b) Explain principle of measurement of gear tooth thickness using a gear tooth Vernier.

(c) An angle of 98°, 27', 15" is to be developed using angle gauges set of [1°, 3°, 9°, 27°, 41°], [1', 3', 9', 27'], [3", 6", 18", 30"] and a right angle. Show arrangement with sketch.

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