



22342

11819

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) *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 'metrology'.
- b) State any four advantages of optical comparator.
- c) State the term selective assembly.
- d) Draw neat sketch of metric screw thread profile.
- e) List down instrument used in angular measurement.
- f) Define sampling length.
- g) Define straightness.

2. Attempt **any three** of the following :

12

- a) Differentiate between systematic errors and random errors.
- b) Define wavelength standard. State advantages and disadvantages.
- c) Explain with neat sketch hole basis system.
- d) Explain the principle of measurement of tooth thickness by gear tooth vernier caliper.

3. Attempt **any three** of the following :

12

- a) Distinguish between 'Alignment Test' and 'Performance Test' of machine tool.
- b) Sketch a micrometer and explain its working.
- c) Draw labelled sketch of sigma comparator and explain its working.
- d) Differentiate between 'Tolerance' and 'Allowance'.

P.T.O.



4. Attempt **any three** of the following :

12

a) Prepare stack of slip gauges for height 58.975 mm using set M112.

Ranges (mm)	Step (mm)	Pieces
1.001 to 1.009	0.001	09
1.01 to 1.49	0.01	49
0.5 to 24.5	0.5	49
25, 50, 75, 100	25	04
1.005	–	01
	Total	112

b) Explain the working principle of floating carriage dial micrometer enlist its application.

c) Explain terminology of screw thread.

d) Explain the principle of stylus probe type direct instrument measurement of surface finish.

e) Draw the following alignment test of Lathe machine.

1) Levelling of Lathe machine

2) Parallelism of main spindle to saddle movement.

5. Attempt **any two** of the following :

12

a) Describe with neat sketch the working of 'Parkinson gear tester' .

b) Define accuracy and list any four factor affecting accuracy of instrument.

c) Explain why size bar is not used for angle greater than 45° if accuracy in angle measurement is required.

6. Attempt **any two** of the following :

12

a) Describe 'Taylor's principle' for design of limit gauges.

b) An angle of 57°6'9" is to be developed using standard angle gauges set of [1°, 3°, 9°, 27°, 41°], [1', 3', 9', 27'], [3", 6", 18", 30"] and show arrangement using sketch.

c) Describe the flatness testing done by using optical flats.
