

Scheme – I
Sample Question Paper

Programme Name : Diploma in Mechanical Engineering
Programme Code : ME
Semester : Third
Course Title : Engineering Metrology
Marks : 70

22342

Time: 3 Hrs.

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) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Define 'Metrology'
- b) List Different Measuring standard
- c) State the term" Interchangeability
- d) List different methods of measuring Tooth Thickness
- e) State the use of "Combination Set"
- f) Define "Lay"
- g) List the causes of Surface Roughness

Q.2) Attempt any THREE of the following.

12 Marks

- a) Differentiate between Precision and accuracy
- b) Explain the wringing of Slip gauges with neat sketch
- c) Explain Hole basis System? Why it is Preferred
- d) Describe the procedure of measurement of tooth thickness using constant chord method with neat sketch

Q.3) Attempt any THREE of the following.

12 Marks

- a) Explain parallax error with neat sketch
- b) A cylinder of 80mm diameter was placed between the micrometer anvils due to inaccurate placement, the angle between the micrometer and cylinder axis was found to be 1 minute .calculate the amount of error in the measured diameter, take anvil diameter 6mm

- c) Distinguish between Line Standard and end Standard
- d) Explain with representation of features of Geometrical tolerance in Simple engineering part

Q.4) Attempt any THREE of the following.

12 Marks

- a) Draw the labeled diagram of Sigma comparator and explain its working
- b) Calculate the diameter of best wire size for M20 x 1.5
- c) Suggest a suitable method of inspection for the profile of screw thread with sketches
- d) Sketch and Interpret the meaning of various interference fringes patterns observed using optical flat
- e) Draw the alignment test of Squareness of Spindle axis of radial Drilling Machine

Q.5) Attempt any TWO of the following.

12 Marks

- a) Describe the procedure of measurement of tooth thickness using constant chord method with neat sketch
- b) Draw the spur gear showing its terminology
- c) An angle of $49^{\circ} 29' 18''$ is to be developed by using standard angle gauge set of 13 pieces. Calculate the gauges required and sketch the arrangement

Q.6) Attempt any TWO of the following.

12 Marks

- a) The angle of Taper plug gauge is to be checked using sine centre and slip gauges, Sketch the set up and describe the procedure
- b) Explain the construction of Bevel Protractor with neat sketch
- c) Draw the following alignment test of Lathe machine
 - i) Parallelism of tail stock
 - d) Run out of spindle

Scheme – I
Sample Test Paper - I

Programme Name : Diploma in Mechanical Engineering
Programme Code : ME
Semester : Third
Course Title : Engineering Metrology
Marks : 20

22342

Time: 1 Hour

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) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a. Define Least count of an Instruments
- b. List different sources of errors in the Measuring instruments
- c. Define- Line Standard
- d. State the Term NABL Certification
- e. List Different types of “Fit”
- f. List the uses of Snap Gauges

Q.2 Attempt any THREE.

12 Marks

- a. Explain terms- Precision and Sensitivity
- b. A cylinder of 80mm diameter was placed between the micrometer anvils due to inaccurate placement, the angle between the micrometer and cylinder axis was found to be 1 minute .calculate the amount of error in the measured diameter, take anvil diameter 6mm
- c. Differentiate between mechanical and Pneumatic Comparator
- d. Explain the need and standard procedure for calibration
- e. Explain Hole basis System? Why it is Preferred
- f. A shaft of +/- 0.004 mm is to be checked by means of GO and NOGO gauge .Design the dimension of gauge required

Scheme – I
Sample Test Paper - II

Programme Name : Diploma in Mechanical Engineering

Programme Code : ME

Semester : Third

Course Title : Engineering Metrology

Marks : 20

22342

Time: 1 Hour

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) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a. Define- Pitch diameter
- b. List different types of errors in Gear
- c. State the limitation of Sine Bar
- d. List different Angular measuring devices
- e. State the function of CMM
- f. State the principle of Surface roughness Tester

Q.2 Attempt any THREE.

12 Marks

- a. Explain the principle of working of ‘Parkinson’s Gear tester’ with neat sketch
- b. Draw a neat labelled sketch of screw thread micrometer. State its principle of working
- c. Describe the principle of “Interference “ with sketch
- d. List different sets of angle gauges available in Metrology lab with their values
- e. In the measurement of surface roughness, heights 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
- f. Explain how the straightness of lathe bed may be checked by using spirit level