

22450

23242

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) Use of Non-programmable Electronic Pocket Calculator is permissible.
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
(8) preferably, write the answers in sequential order.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Define the term 'Precision'.
 - b) List any two examples of systematic errors.
 - c) State the meaning of Interchangeability.
 - d) Define following errors in gears
 - i) Backlash
 - ii) Run out
 - e) State the principle of working of clinometers.
 - f) List any four alignment tests performed in drilling machine.
 - g) State the meaning of quality assurance.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) If 'n' measurements are made using an instrument denoted by V_1, V_2, V_3, \dots , then write the formulae to calculate arithmetic mean and standard deviation.
 - b) Compare line and end standards on the basis of following characteristics.
 - i) Principle of measurement
 - ii) Accuracy of measurement
 - iii) Alignment
 - iv) Parallax effect
 - c) With the help of sketch write the working principle of sigma comparator.
 - d) Compare between hole basis system and shaft basis system.
- 3. Attempt any THREE of the following:** **12**
- a) With the help of sketch illustrate following types of fits
 - i) Clearance fit
 - ii) Transition fit
 - b) Explain the Taylor's principle of gauge design.
 - c) Make labelled sketch of 'Tool makers microscope'.
 - d) With the help of sketch, explain the procedure to measure major diameter of screw thread.
- 4. Attempt any THREE of the following:** **12**
- a) Explain how constant chord method is used.
 - b) Illustrate with sketch the following terminologies associated with screw thread.
 - i) Pitch
 - ii) Addendum
 - iii) Dedendum
 - iv) Flank angle

- c) Using the set of [1° , 3° , 9° , 27° , 41°] [$1'$, $3'$, $9'$, $27'$] [$3''$, $6''$, $18''$, $30''$] angle ganges, illustrate with sketch how can we set the angle $42^\circ 35' 20''$.
- d) Describe bevel protector with sketch.
- e) Define the following terms referred to surface finish.
 - i) Roughness
 - ii) Surface texture
 - iii) Waviness
 - iv) Lay

5. Attempt any TWO of the following:

12

- a) With the help of neat sketches, illustrate following tests on lathe machine.
 - i) Levelling of machine
 - ii) True running of head stock centre
- b) List any three fringe patterns in testing surface using optical flat. Also draw it's sketches.
- c) Define the following terms.
 - i) Reliability
 - ii) Maintainability

6. Attempt any TWO of the following:

12

- a) Differentiate between \bar{X} chart and R chart. (six points)
 - b) Explain AQL and LTPD in judging consumer's risk and producer's risk.
 - c) Number of defects found in inspection of 10 assemblies are 2, 3, 2, 5, 2, 3, 5, 3, 0, 1 respectively. Draw appropriate control chart and conclude.
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