

# 17530

**21819**

**3 Hours / 100 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) Use of Steam tables, logarithmic, Mollier's chart is permitted.

**Marks**

1. a) **Attempt any THREE of the following:** **12**
  - (i) Explain the need of inspection in industries.
  - (ii) Define Taylor's principle as applied to design of limit gauges.
  - (iii) Explain with sketch construction and working principle of SINE BAR'.
  - (iv) Differentiate between alignment test and performance test (any four parameters).
  
- b) **Attempt any ONE of the following:** **6**
  - (i) List any six major objectives of metrology.
  - (ii) Draw neat sketch of universal Bevel protractor and write the procedure for measuring Angle of work piece.

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2. **Attempt any FOUR of the following:** **16**
- a) Distinguish between line standard and end standard.
  - b) State the limitations of sine bar.
  - c) Explain importance of surface finish.
  - d) Explain the following errors in gears:
    - (i) Backlash
    - (ii) Runout
  - e) List objectives of quality control (any four).
3. **Attempt any FOUR of the following:** **16**
- a) Define wringing of slip gauges.
  - b) Differentiate between unilateral system and bilateral system of tolerances.
  - c) Explain constant chord method for measuring tooth thickness of gear.
  - d) Define:
    - (i) Roughness
    - (ii) Lay
    - (iii) Waviness
    - (iv) Sampling length
  - e) Explain cost of quality and value of quality.
  - f) State limitation of acceptance sampling.
4. a) **Attempt any THREE of the following:** **12**
- (i) List the requirement of good comparators (any four).
  - (ii) Explain interchangeability? State its advantages.
  - (iii) Describe with sketch the “Parkinson Gear Tester”.
  - (iv) Explain procedure of straightness checking using spirit level.
  - (v) Explain the importance of TQM .

- b) **Attempt any ONE of the following:** **6**
- (i) Explain with sketch working of sigma comparator.
  - (ii) Explain working principle of floating carriages dial micrometer.
- 5. Attempt any TWO of the following:** **16**
- a) Write the procedure for measuring effective diameter of screw thread by using two wire method.
  - b) Differentiate between variable and attribute inspection:
    - (i) On any four parameter
    - (ii) Draw normal distribution curve and state its characteristics
  - c) Find mean, mode and median of following data:  
2, 3, 4, 5, 2, 3, 4, 5, 4, 5
- 6. Attempt any TWO of the following:** **16**
- a)
    - (i) Explain six sigma with suitable example.
    - (ii) State importance of QS 14000 standard.
  - b)
    - (i) Explain double sampling plan.
    - (ii) Explain OC curve. Draw ideal and actual OC curves.
  - c) The following are the results of 20 lots each lot contains 750 objects number of defective objects in each lot are as follows  
48, 83, 70, 85, 90, 56, 54, 71, 36, 49, 29, 51, 28, 33, 37,  
80, 70, 48, 67, 57.  
Analyze the data on the base of appropriate control chart.  
Calculate control limit and state whether the process is in control.
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