

Total No. of Questions : 9]

SEAT No. :

**P2839**

**[4958]-1012**

[Total No. of Pages : 2

**T.E.(Mechanical)**

**METROLOGY AND QUALITY CONTROL**

**(2012 Course) (End Sem)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory (Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9.)*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data if necessary.*
- 4) *Use of calculator is allowed.*
- 5) *Figures to the right side indicate full marks.*

**Q1) a)** Differentiate between systematic errors and random errors. **[5]**

b) State different types of comparators, explain sigma comparator in detail. **[5]**

OR

**Q2) a)** Describe with neat sketches of auto-collimator and sine bar. **[5]**

b) State different types of linear and angular measuring instruments, explain any two with example. **[5]**

**Q3) a)** State and explain Taylor's Principle of Gauge Design with example. **[5]**

b) Optical arrangement of interferometer for testing flatness of surfaces. **[5]**

OR

**Q4) a)** What is surface texture? State different methods to analyze surface trace **[5]**

b) A machine operator needs a gauge for checking the diameter of bores being machined to diameter  $20 + 0.06$  mm. What should be the dimensions (diameter) of the gauge if unilateral systems of tolerances are incorporated? Assume gauge tolerance and wear allowance each as 10% of work tolerance. **[5]**

**P.T.O.**

- Q5) a)** Explain PDCA & PDSA Cycle. [8]
- b) Describe different quality costs. [8]

OR

- Q6) a)** Write short note on: Juran's Trilogy. [8]
- b) Differentiate between Quality Assurance & Quality control. [8]

- Q7) a)** Ten samples of parts were taken from a production line For 100% inspection, each sample containing 300 parts. The total number of defection was 350. Compute upper and lower control limit [5]
- b) Explain analysis on out of control condition referring control charts. [5]
- c) Explain in detail with flow chart single sampling and double sampling plan. [8]

OR

- Q8) a)** A new process is started, and the sum of sample standard deviation for 25 subgroups of size 4 is 750. If the specifications are  $700 \pm 80$ , what is process capability index? what action would you recommend take for four samples factor for centeline =  $c_4 = 0.9213$  [6]
- b) Ten castings were inspected in order to locate defect in them after in spection total 37 defects were found. Compute control limit for c-Chart. [4]
- c) Write note on PPAP and OC curve. [8]

**Q9) Write short note on (any four) [16]**

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|---------------------------|-------------------|
| a) Cause & effect diagram | b) Pareto diagram |
| c) Kaizen                 | d) TPM            |
| e) 5 s                    | f) J I T          |

