

Total No. of Questions : 9]

SEAT No. :

P3345

[Total No. of Pages : 3

[5353]-515

T.E. (Mechanical)

METROLOGY AND QUALITY CONTROL

(2015 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagram must be drawn wherever necessary.
- 3) Assume Suitable data if necessary.
- 4) Use of Calculator is allowed.
- 5) Figures to the right indicate full marks.

- Q1)** a) Differentiate between Precision & Accuracy with Suitable examples. [5]
b) Draw a neat sketch of micrometer & how to calculate least count of micrometer, give one example. [5]

OR

- Q2)** a) a) Explain any one method of assessing the surface finish. [5]
b) Explain tool makers microscope & their application. [5]

- Q3)** a) Explain laser interferometer & its application. [5]
b) Write short note on machine vision system. [5]

OR

- Q4)** a) State & Explain Taylor's principle of gauge design with example. [5]
b) Explain method of measuring effective diameter using two wires with neat sketch. [5]

- Q5)** a) Explain Jurans trilogy approach with diagram. [8]
b) State seven new quality tools. Explain any three in detail. [8]

OR

P.T.O.

Q6) a) What is cost of quality? Explain Cost of failure, Cost of appraisal & cost of prevention. [8]

b) What is initial planning for quality? Explain in details. [8]

Q7) a) What are advantages of sampling inspection over 100% inspection? Explain the difference between single sampling & double sampling plan. [8]

b) Following is the record for successive lots of part being produced by plastic molding press. As each lot is come off the line a random sample of 150 pieces were inspected (results are expressed to the nearest 0.1%) Calculate $\bar{p}$, Control limits & plot control chart and comment. [8]

Lot no	Sample size	No. of defectives
1	150	4
2	150	8
3	150	2
4	150	4
5	150	4
6	150	6
7	150	10
8	150	4
9	150	6
10	150	8

OR

Q8) a) Write short note on OC curve & its characteristics. [8]

b) Explain single sampling plan with flow chart. For the given data calculate sample size and AOQ for single sampling plan [8]

i) Probability of acceptance for 0.3% defectives in a lot is 0.558

ii) Lot size $N = 10000$ units

iii) $np' = 1.5$

iv) Acceptance number $c = 1$

v) Defectives found in the sample are not to be replaced

Q9) Write short note on (Any three) :

[18]

- a) Kanban
- b) Zero defects
- c) FMECA
- d) TS-16949
- e) Quality Audit

