Total No. of Questions : 9]

SEAT No. :

P2492

[Total No. of Pages : 2

[5253] - 510
TE (Mechanical Engg.)
End Semester
METROLOGY AND QUALITY CONTROL
(2015 Pattern)

Time :2½ hours] *[Max. Marks :70*

Instructions to the candidates:

1) *Neat diagrams must be drawn wherever necessary.*
2) *Solve Q.No,1 or 2, Q.No.3or 4,Q,No.5or 6,Q.No.7or 8 &Q.no.9*
3) *Assume suitable data, if necessary.*
4) *Use of non-programmable calculator is allowed*
5) *Figures to the right indicate full marks.*

Q1) a) Explain construction & working of Micrometer with it's Applications **[5]**

b) Find the shaft & hole dimensions with tolerance for a **90H8e9** pair given the following data with standard notations - 90 mm lies in diameter step of 80 to 100 mm. Upper deviation for e shaft = -11D^0.41 , Tolerance unit, i = 0.45(D)^0.33 + 0.001D. IT8 = 25i & 1T9 = 40i **[5]**

OR

Q2) a) Explain Centre Line Average (CLA) & Root Mean Square (RMS) method of analyzing the surface trace **[5]**

b) Explain (any 1) - i) Gauge Repeatability & Reproducibility ii) LVDT Comparator **[5]**

Q3) a) Explain various types of Screw thread errors **[5]**

b) Write note on - Automatic Inspection Systems **[5]**

OR

Q4) a) Explain working of Gear Tooth Vernier Caliper **[6]**

b) Differentiate between Alignment Tests & Running tests **[4]**

Q5) a) Write a note on Cost of Quality & Value of Quality **[7]**

b) Explain Deming's PDCA cycle & Deming's 14 points **[9]**

OR

Q6) a) Enlist 7 Basic Quality Tools & explain any 2 from them **[9]**

b) Explain Concept of Controllability of Quality : Self Control **[7]**

Q7) a) Explain in detail : Operating Characteristics Curve showing Producer's Risk, Consumer's Risk, AQL, LTPD, Indifference Region **[8]**

b) Table below shows the number of defectives found in inspection of 10 lots of 100 magnets each **[8]**

Lot no.	1	2	3	4	5	6	7	8	9	10
No. of Defectives	3	2	5	2	1	4	4	13	4	3

(i) Determine the control limits for P chart and state whether the process is in control.

(ii) If the point that goes outside the control limits is analyzed and eliminated, what will be the values of new control limits?

OR

Q8) a) Write a note on Process Capability & explain the indices: Cp, Cpk & Ppk **[10]**

b) Calculate sample size & AOQ for Single Sampling Plan using following data - Probability of acceptance of 0.4% defectives in a lot = 0.558, Lot size = 10000, Acceptance number = 1, np' for sample = 1.5, Defectives found in the sample are not to be replaced. If defectives found in sample are to be replaced then what will be AOQ? **[6]**

Q9) Write detailed note on (Any 3) **[18]**

a) TPM ,

b) ISO / TS 16949 Quality Management System,

c) FMECA,

d) Kanban,

e) Six Sigma

f) Poka Yoke