Total No. of Questions : 9]

SEAT No. :

P2549

[Total No. of Pages : 2

[5153]-514
T.E.(Mechanical)
METROLOGY AND QUALITY CONTROL
(2012 Pattern) (Semester - I) (End Sem.)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

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

Q1) a) State the methods for checking External and Internal Taper, explain why sine bar is Used for lesser values of on angle. **[6]**

b) Explain difference between accuracy and precision. **[4]**

OR

Q2) a) Explain working, construction of a mechanical comparator,(Any one) What are its limitations. **[6]**

b) Explain any one method of assessing the surface finish. **[4]**

Q3) a) How to check tooth thickness of a spur gear by using gear tooth vernier caliper. **[5]**

b) Explain three wire method in thread measurement. **[5]**

OR

Q4) a) Explain Appraisal, Prevention, Failure costs with suitable examples. **[4]**

b) Identify the given fit with sketch 25H7/g6,25H7/p8 & 25H7/k10. **[6]**

Q5) a) Define quality control and give objectives of quality control. **[8]**

b) State Seven Quality control tools. Explain any three in detail. **[8]**

OR

Q6) a) Write a short note on (any.2): **[8]**

i) 5 S

ii) TPM

iii) Kaizen

b) Explain ISO- 9001, 9002, 9003 & TS 16949 quality system standards. **[8]**

P.T.O.

Q7) a) Sheet metal components were inspected for wrinkle formations and following are the observations for number of defectives per sample lot of 100 numbers.

Lot Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Defectives	6	8	7	8	9	3	6	13	7	6	8	5	6	15	3	11	5	4	6	9

Determine the process is statistically stable or otherwise. If yes, suggest control limits for defectives. **[6]**

b) Explain analysis of out of control condition referring control charts. **[4]**

c) What are the advantages of sampling inspection over 100% inspection? Explain the difference between single sampling and double sampling plan. **[8]**

OR

Q8) a) A milling operation is required to generate a dimension 25±0.5mm. The observations over 450 components were summarized as follows

Dimensions	25.7	25.9	25.0	25.8	25.6	25.7	25.5	25.4	25.3	25.2	25.1
Components	8	37	45	12	18	7	39	62	76	88	58

Determine the Average, Range, Standard Deviation and process capability. **[8]**

b) Write note on FMECA and OC curve. **[8]**

c) Explain process capability index. **[2]**

Q9) Write a short note on (any.4): **[16]**

a) Affinity diagram

b) Matrix diagram

c) Kanban

d) Process Decision Program Chart

e) QFD

f) JIT