

Total No. of Questions : 9]

SEAT No. :

P2549

[5153]-514

[Total No. of Pages : 2

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 ± 0.5 mm. 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

