

Total No. of Questions : 9]

P2549

SEAT No. :

[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. i.e. (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  $25 \pm 0.5$  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

