Total No. of Questions :12]

SEAT No. :

P2816

[Total No. of Pages :4

[4958]-119
T.E. (Mechanical)
METROLOGY AND QUALITY CONTROL
(2008 Course) (Semester - II)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer any 3 questions from each section.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of Logarithmic tables, slide rule, electronic non programmable pocket calculator is allowed.***
5) ***Assume suitable data it necessary.***

SECTION - I

Q1) a) Differentiate between Line and End Standards **[4]**

b) Explain construction working, application, advantages and limitations of Johansson's Microkator Comparator. **[8]**

c) What is the difference between Alignment test & performance test? Explain with neat sketch any one such tests on a Lathe machine. **[4]**

OR

Q2) a) Explain Different types of Errors in Measurement. **[8]**

b) Describe with neat sketches of autocollimator & sine bar. **[8]**

Q3) a) Difference between primary & secondary texture. **[4]**

b) Explain concept of RMS value for surface roughness. **[6]**

P.T.O.

c) Design and make a drawing of general purpose GO and NOGO plug gauge for inspecting hole of $70H_8$ Data with usual notation. **[8]**

i) i (micron) = $0.45 * 3 \sqrt{D} + 0.001D$,

ii) Diameter step 50 to 80 mm

iii) The value of tolerance for IT_8=25i

OR

Q4) a) What are optical flat? How are patterns of fringes interpreted? **[5]**

b) Explain working of LASER interferometer with neat sketch. **[5]**

c) Design GO and NOGO limit plug gauge for checking a hole having $50^{+0.06}_{-0.00}$ Size Assume gauge maker's tolerance equal to 10% of work tolerance and wear allowance equal to 10% of gauge maker's tolerance.**[8]**

Q5) a) Calculate the constant chord length & its distance below the tooth tip for gear of module 5mm & pressure angle 20^o **[6]**

b) describe working of universal measuring machine. **[4]**

c) Write a short note on computer controlled co-ordinate measuring machine. **[6]**

OR

Q6) a) Derive the relation for Best wire size for M24x3 mm external threads. Calculate the Diameter of the best wire size and the difference between the size under the wires and effective diameter. **[6]**

b) Write short note on, (Any Two): **[10]**

i) Gear tooth Vernier caliper.

ii) Lasers in Metrology.

iii) Machine Vision.

SECTION - II

Q7) a) Explain Cost of Quality and Value of Quality. **[6]**

b) Explain the concept of Quality Circle and their structure, advantages and limitations. **[5]**

c) Distinguish between Quality of design and Quality of Conformance. **[5]**

OR

Q8) a) Describe the steps to implement the Quality Policy and Quality Audit. **[6]**

b) Explain what do you understand by Concurrent Engineering. **[5]**

c) Explain PDSA and PDCA cycle for quality control. **[5]**

Q9) a) Explain ISO 9000 Quality system standard. **[6]**

b) What do you understand by FMECA. **[5]**

c) Write a note on 5s. **[5]**

OR

Q10)a) Explain following terms: **[12]**

i) JIT

ii) ISO 14000 and TS 16949

iii) Concept of zero defect

b) Explain the kanban **[4]**

Q11)a) Draw and Explain Operating Characteristics Curve. **[6]**

b) Explain different types of Sampling plans and state relative merits and demerits. **[6]**

c) What are the Objective of SQC. **[6]**

OR

Q12)a) Explain DMAIC used in Six sigma. **[4]**

b) The number of Defects found in each sample of cloth of one Sq. Meter area are noted down as Follows. Draw the appropriate control chart and state if the process is in Control or not **[10]**

Sr No	1	2	3	4	5	6	7	8	9	10	11	12
Defect	8	9	5	8	5	9	9	11	8	7	6	4

c) Write short note on “Control Chart Patterns **[4]**