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Total Number of Pages: 02

B.TECH
PEME5405

7th Semester Regular / Back Examination 2015-16
METROLOGY, QUALITY CONTROL & RELIABILITY

BRANCH: MECHANICAL

Time: 3 Hours

Max marks: 70

Q.CODE: T486

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions: (2 x 10)
- a) State the difference between Accuracy and Precision.
 - b) Distinguish between line standard and end standard
 - c) Discuss Repeatability vs Reproducibility
 - d) Draw and define a gear tooth vernier caliper
 - e) Explain the parallelism testing. What is the procedure for testing parallelism of two planes in which one plane is moving?
 - f) Describe how Scratch inspection and Microscopic inspection is carried out.
 - g) Explain CUSUM chart in control charts for variables.
 - h) Define mean, mode, median and Standard deviation.
 - i) State merits and demerits of acceptance sampling.
 - j) Differentiate between systematic error and random error
- Q2 a) Distinguish between Unilateral and bilateral tolerance system. (4)
b) What is LVDT? Write down construction, working and uses of LVDT with a neat sketch of LVDT. (6)
- Q3 a) Define quality audit. Why audit is done in quality circle? What are the significance of quality audit? (5)
b) What is ISO 9000? What are the advantages of ISO 9000 series? Also discuss the limitations of ISO 9000 series. (5)
- Q4 a) Draw PDCA cycle and explain it. (4)
b) In the lot of 50 pieces, each sub-group is of 5-pieces and for sub-group X-bar and R- values for the "length of pieces" is as under. (6)

Sr. No	X-bar	R
1	2.12	0.03
2	1.99	0.01
3	1.80	0.02
4	2.00	0.04
5	1.99	0.02
6	2.45	0.01
7	1.85	0.05

8	1.70	0.04
9	1.98	0.06
10	2.30	0.03

By using general formulae, prepare X-bar and R-chart and write the interpretation of chart.

- Q5 a) Distinguish between Variable Inspection and Attribute Inspection. (5)
b) Explain in brief with sketch, two wire method for thread measurement. (5)
- Q6 a) What is ISO 14000? State the importance of ISO 14000 standard. (5)
b) What is an OC curve? State the step by step procedure for construction of an OC Curve. State the meaning and significance of important points on the OC Curve. (5)
- Q7 a) List down four types errors in gear metrology. With suitable sketch explain the measurement procedure for any one of them. (5)
b) State the meaning of selective assembly. State its relation with the concept of interchangeability in mass production. (5)
- Q8 Answer any two (5 x 2)
a) Explain KANBAN in detail
b) What is QFD? Draw a neat sketch of House of quality and show various steps in QFD process
c) What is POKA-YOKE? Explain.
d) Write short note on SPC.