Roll No. .....

24481

B. Tech. 7th Semester (ME) Examination – December, 2014

QUALITY ENGINEERING

Paper : ME-417-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Sections. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Attempt ***all*** the 10 questions : $2 \times 10 = 20$

(i) Define the concept of Quality.

(ii) What are the benefits of quality control ?

(iii) Average outgoing quality.

(iv) Define the inspection.

(v) Explain the difference between binomial and passion distribution.

(vi) What do you mean by TQM ?

(vii) Define quality circles.

(viii) What are the 7QC tools ?

(ix) Explain briefly TQC.

(x) What are the objectives of the control charts ?

SECTION – A

2. What do you mean by quality ? Explain its importance and different factors affected quality of a product. 20

3. Write short notes on :

(a) Explain the terms 'quality' and 'quality control'. How does quality control differ from conventional inspection ? 10

(b) Explain the difference between quality control and quality improvement. 10

SECTION – B

4. (a) Explain the difference in interpretation between an observation falling below the lower control limit on an X-bar chart and one falling below the lower control limit on an R-chart. Discuss the impact of each on the revision of control charts. 10

(b) Explain some causes that would make the control chart pattern follow a gradually increasing trend. 10

5. Determine the control limit for X and R chart if EX = 357.50, ER = 9.90, number of subgroups = 20. It is given that A2 = 0.18, D3 = 0.41 and D4 = 1.59. The following are the X-bar and R-values of 4 subgroups of readings : X-bar = 10.2, 12.1, 10.8 and 10.9, R = 1.1, 1.3, 0.9 and 0.8. The specification limits for the components are 10.7 ± 0.2. Establish the control limits for X-bar and R-charts. Will the product able to meet it specification ? Given : 20

(a) A2 (factor for X-bar chart) = 0.58

(b) D4 (factor for R chart) = 2.11

(c) D3 (factor for R chart) = 0.00

SECTION – C

6. A manufacturer of pins knows that on an average 5% of his product is defective. He sells pins in a packet of 100 and grantees that not more than 5 pins will be defective. What is the probability that a packet will meet the guaranteed quality ? Given $e^{-5} = 0.0067$. Use passions distribution. 20

7. Write short notes on : 20

(i) Explain the terms AOQ and AOQL for single sampling and double sampling plans.

(ii) What are the advantages and disadvantages of variable sampling plans over those for attributes ?

SECTION – D

8. What do you mean TQM and explain its element and scope of manufacturing industries ? 20

9. Explain any ***four*** : 4×5

(i) Quality Manual.

(ii) Zero defect.

(iii) Lean manufacturing system.

(iv) Kaizen.

(v) Kanban system.