Q 8200

M.E. DEGREE EXAMINATION, MAY/JUNE 2006.

Second Semester

Industrial Engineering

IE 1653 – QUALITY ENGINEERING

(Regulations 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the term "Quality Assurance Function".

2. What property does the mean and standard deviation of a normal distribution curve reveal?

3. List out the factors which contribute to the success of a sampling plan.

4. What do you mean by an operating characteristic (OC) curve?

5. What is experimental design?

6. Write the conditions that column in a table are to be orthogonal.

7. What are the general characteristics of any TQM procedure?

8. Define the term "confounding".

9. What is meant by the term 'reliability'?

10. Explain the relation between availability and reliability of a system.

PART B — (5 × 16 = 80 marks)

11. (i) Explain in detail the various steps involved in calculating the limits of control charts for variables. (7)

(ii) Discuss in brief the possible relationship of a process in control to upper and lower specification limits. (9)

12. (a) (i) Describe in detail the operating characteristics (OC) curve. (10)

(ii) Define average outgoing quality (AOQ) and explain how it is calculated. (6)

Or

(b) (i) Compare the economics of 100% inspection and sampling procedure and derive an equation for fraction defective. (7)

(ii) Explain the design procedure for double sampling plan. (6)

(iii) Write the equation for the average total inspection (ATI) for double sampling plan. (3)

13. (a) (i) Explain the concept of one-way analysis of variance model. (10)

(ii) Write short notes on Randomized Block Design. (6)

Or

(b) (i) Describe with a suitable example how 2^2 factorial design is carried out. (9)

(ii) What is the significance of signal-to-noise ratio? What are its types? Explain. (7)

14. (a) (i) Explain in brief the six basic concepts required by TQM. (8)

(ii) Distinguish between quality of design and quality of conformance. (8)

Or

(b) (i) Define Quality Function Deployment (QFD). (2)

(ii) Explain how the House of Quality is constructed? (14)

(a) (i) Explain with a neat sketch, the various failure behaviour in any process. (bath tub curve) (9)

(ii) Define the term failure density, failure rate and mean time to failure. (MTTF) (7)

Or

(b) (i) How reliability is calculated when the units in a system are dependent and independent? (6)

(ii) Draw the possible configuration of 3 units in a system and determine the reliability when they are dependent. (10)
