



M.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

First Semester

INDUSTRIAL ENGINEERING

P18IET1004 Quality Engineering

COURSE OUTCOMES

- CO1: Define quality objectives and differentiate quality control and quality assurance.
- CO2: Use OC curves for drawing conclusions in sampling and determine ATI, ASN, AOQL.
- CO3: Demonstrate factorial experiments and use orthogonal arrays and Taguchi methods.
- CO4: Use the quality tools to improve the production process.
- CO5: Apply the reliability concept on system design.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The following sequence methods contain Probability sampling process. CO2 [K_L]
 1. Simple Random Sampling
 2. Systematic Sampling
 3. Stratified Sampling
 4. Cluster Sampling

a) 1-2-3-4	b) 1-3-4-2
c) 4-3-2-1	d) 2-4-1-3
2. The most common multivariate quality control chart is CO1 [K₁]

a) T1	b) T2
c) T3	d) T4
3. An operating characteristic curve is a plot between probability of acceptance versus percentage of CO1 [K_L]

a) Selected items	b) Sampling
c) Defective items	d) Lots

c) Redundancy

d) orthogonal arrays

PART B (10 x 2 = 20 Marks)

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| 11. Define Quality control | CO1 | [K ₂] |
| 12. What is a multivariate control chart? | CO1 | [K ₂] |
| 13. Define sampling | CO2 | [K ₂] |
| 14. What is OC curve used for? | CO2 | [K ₂] |
| 15. Recall factorial experiments | CO3 | [K ₂] |
| 16. What is DOE with one factor? | CO3 | [K ₂] |
| 17. Compare ISO 9000 and TQM concepts | CO4 | [K ₂] |
| 18. List the 7 tools of quality | CO4 | [K ₂] |
| 19. Define Reliability | CO5 | [K ₂] |
| 20. Tell about series and parallel system in reliability | CO5 | [K ₂] |

PART C (6 x 5 = 30 Marks)

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|--|-----|-------------------|
| 21. Explain the quality management principles | CO1 | [K ₂] |
| 22. Identify the types of Variable Control Charts | CO1 | [K ₂] |
| 23. Identify the single double and sequential sampling | CO2 | [K ₂] |
| 24. Outline about design of experiments in 2K design system | CO3 | [K ₂] |
| 25. Explain the goal of Six Sigma is to achieve zero defects | CO4 | [K ₂] |
| 26. Outline about statistical distribution | CO5 | [K ₂] |

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

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|--------------------------------------|-----|-------------------|
| 27. Illustrate Process capability | CO1 | [K ₃] |
| 28. Explain about ATI, ASN and AOQL | CO2 | [K ₃] |
| 29. Organize steps in Taguchi method | CO3 | [K ₃] |

30. Explain quality function deployment with suitable example.

CO4 [K₃]

31. Illustrate reliability prediction process

CO5 [K₃]
