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10MT82

Eighth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Reliability and Fault Tolerance

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Explain briefly with bath tub curve failures and failure modes. (10 Marks)
- b. What are the causes of failure and unreliability of components? Explain. (10 Marks)
- 2 a. What are the methods involved in designing for higher reliability? (10 Marks)
- b. Describe fault tree analysis, applications and steps to fault tree analysis. (10 Marks)
- 3 a. Define plant item and explain the principles of preventive maintenance. (10 Marks)
- b. Describe different methods of maintenance approaches. (10 Marks)
- 4 Write short notes on:
 - a. Trend monitoring
 - b. Thermal monitoring
 - c. Lubrication maintenance
 - d. Vibration monitoring
 (20 Marks)

PART – B

- 5 a. Explain failure masking by redundancy. (10 Marks)
- b. Describe active and standby redundancy. (10 Marks)
- 6 a. Explain fault tolerant control system. (10 Marks)
- b. Explain hardware sensor redundancy. (10 Marks)
- 7 a. Define fault tree and how fault tree can be constructed. (10 Marks)
- b. Describe product and equipment hazards. (10 Marks)
- 8 a. Explain briefly fault detection of DC motor with parity equation and parameter estimation. (10 Marks)
- b. Explain the fault detection of an automotive suspension and the tire pressure using parameter estimation. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.