

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: ME376

Course Name: Maintenance Engineering

Max. Marks: 100

Duration: 3 Hours

PART A

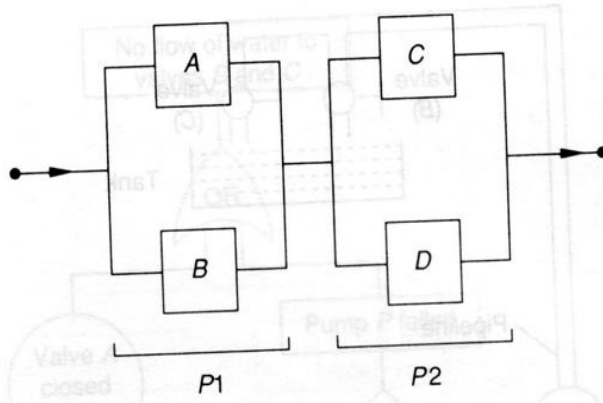
Answer any three full questions, each carries 10 marks.

- | | | Marks |
|---|---|-------|
| 1 | a) How maintainability and reliability are related to availability? | (4) |
| | b) List and explain any four methods of reliability improvements | (4) |
| | c) How operational availability defer from inherent availability | (2) |
| 2 | a) Sketch and explain the significance of bath tub curve | (6) |
| | b) Calculate the system reliability of a stereo effect music system with four mikes (reliability 0.95 each) two boxes/speakers (reliability 0.8each), one mixer (reliability 0.98), one amplifier (reliability 0.96) and three optional power supply KSEB (reliability 0.85), battery (reliability 0.96) and generator (reliability 0.82). Sketch RBD of your arrangement | (4) |
| 3 | a) Sketch and explain any schematic arrangement to carry out conditioning monitoring by 'thermography' method for an electrical equipment | (7) |
| | b) What are the limitations of breakdown maintenance | (3) |
| 4 | a) List and explain the components of preventive maintenance | (5) |
| | b) What are basis on which maintenance strategies are selected | (3) |
| | c) What are the deferent types of corrective maintenance | (2) |

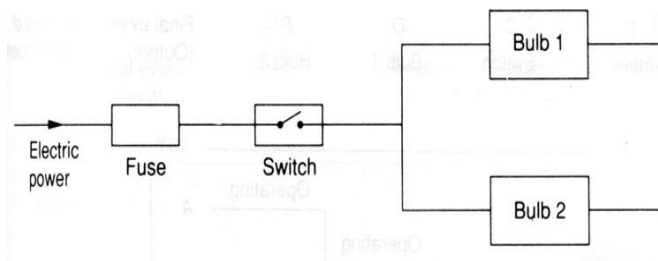
PART B

Answer any three full questions, each carries 10 marks.

- | | | |
|---|---|-----|
| 5 | a) List and explain the principle and operation of any two vibration transducers | (6) |
| | b) How condition monitoring is done using vibration analyser. Give two examples of this application | (4) |
| 6 | a) Detail the process of wear debris analysis and spectrometric analysis used in condition monitoring | (5) |
| | b) What are common debris elements present in lubricants | (3) |
| | c) On what basis the vibration severity charts are prepared | (2) |
| 7 | a) Construct a fault tree for reliability block diagram below | (7) |



- b) What are the steps in root cause analysis (3)
- 8 a) Develop an even tree for the event room without light for the following arrangement (6)



- b) Briefly explain the procedure for conducting FMEA (4)

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) How the Key performance indicators or Key Success Indicator are identified for maintenance in various industries? List any five KPI for maintenance and brief its significance (7)
- b) What is “six sigma” approach in maintenance? Explain. (3)
- 10 a) How the ‘Lean’ concept is used in maintenance? (3)
- b) Which are five zeros in maintenance? (4)
- c) How the quality control charts are utilised for maintenance management (3)
- 11 a) Explain briefly the components or pillars of Total Productive maintenance (6)
- b) What is the concept of zero technology in maintenance (4)
- 12 a) What are the objectives of maintenance training? (3)
- b) What are the hurdles of maintenance budgeting (3)
- c) Compare the centralised and decentralised maintenance (4)

- 13 a) Briefly explain line ,staff and functional organisation (5)
- b) Briefly explain deferent components or features of computer aided maintenance management system (5)
- 14 a) What are the components of maintenance cost? List and explain (5)
- b) List and brief the four levels of competencies of maintenance training (5)