BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

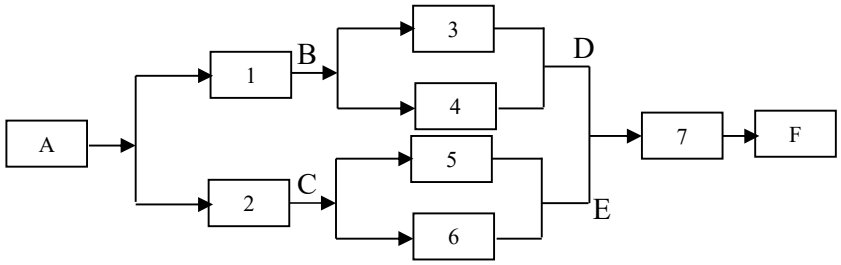
CLASS: BE **SEMESTER : VII**
BRANCH: BT/MECH/PROD/CIVIL **SESSION : MO/17**

SUBJECT: PE7021 MAINTENANCE ENGINEERING

TIME: 3 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) What do you understand be the term TPM? Discuss the objectives of TPM. [2]
(b) Define 'Maintenance Management'. Discuss the responsibilities of maintenance engineers. [4]
(c) Make the fault tree diagram of a given system (shown in the figure below) as there is 'No Current' at point F. [6]



Q.2(a) Compare between serviceability and maintainability. [2]
(b) Define reliability. Explain the factors which should be considered in designing for reliability. [4]
(c) A system has four components A, B, C, and D with reliability values of 0.98, 0.89, 0.94 and 0.95 respectively. If the components are in series, what is the system reliability? If the component B is changed to three parallel components each having the same reliability, what will be the new system reliability? [6]

Q.3(a) Explain the term RCM or reliability centric maintenance. [2]
(b) Briefly discuss the steps involved in the development of an effective PM program. [4]
(c) Discuss sequential steps associated with corrective maintenance. [6]

Q.4(a) Describe the process and outcome of adopting terotechnology. [2]
(b) What is condition-based maintenance approach? Briefly illustrate the various steps involved in a condition-based maintenance program. [4]
(c) Under what condition Lubricant Monitoring/Oil Analysis method can be used for condition monitoring of an equipment? Explain the methodology of monitoring of debris particles in lubricating oils. [6]

Q.5(a) Outline the steps used to prepare a maintenance budget. [2]
(b) Write about the fundamental costs associated with maintenance. [4]
(c) Make a brief note on Maintenance performance indices. [6]

Q.6(a) Define dust. Explain briefly the various types of diseases caused by different types of dusts. [2]
(b) Describe the strategies for reducing human error in maintenance. [4]
(c) Explain briefly the various occupational diseases/health hazards caused due to extreme thermal exposure. Also explain the various preventive measures to be adopted in this regard. [6]

Q.7(a) What are responsibilities of the head of the safety department. [2]
(b) Discuss the various methods of employee training. Which of the training do you feel the most suitable and why? Justify your answer with appropriate example. [4]
(c) What is three lines of defense against health hazards. Describe it briefly. [6]

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