BME-025

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2018

00433

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING

Time : 3 hours   *Maximum Marks : 70*

*Note : Answer any **seven** questions. **All** questions carry equal marks. Use of scientific calculators / standard tables is allowed.*

1. (a) What is preventive maintenance ? Explain the different preventive maintenance tasks.

    (b) Explain 'Reliability Centred Maintenance'. Discuss the important steps involved in implementing it in any plant.   *5+5*

2. (a) What is meant by 'Condition Based Maintenance' ? Explain the condition monitoring procedure with the help of a flow diagram.

   (b) What are the objectives of total productive maintenance ? How does it differ from total preventive maintenance ?   5+5

3. (a) What is maintenance planning ? Describe the different stages involved in maintenance planning.

   (b) Discuss various types of maintenance strategies that are aimed to prevent the occurrence of failures.   5+5

4. (a) What is A-B-C Analysis ? Explain the step-by-step procedure for A-B-C Analysis.

   (b) Define 'Standardisation'. Explain its significance in maintenance of spare parts.   5+5

5. (a) What is 'Availability' ? Discuss the factors affecting the availability of the equipment.

   (b) Explain the terms 'zero defects', and 'zero breakdown', with reference to TPM.   5+5

6. AK Engineering Works, Ghaziabad has been assigned a contract to manufacture a product having seven components, by Indian Railways. Each of these components requires processing on two machines M1 and M2 in the order M1 → M2. The time (in hours) required by each of these jobs for processing on the two machines is given in Table 1. Find the optimal sequence for processing the seven components.

Table 1

S.No.	Component	M1 (hours)	M2 (hours)
1	A	9	2
2	B	5	4
3	C	8	10
4	D	3	5
5	E	4	6
6	F	1	11
7	G	7	6

Also determine the total idle time on each machine. *10*

7. An electric bulb exhibiting a constant failure rate has a reliability of 85 percent for an operating time of 600 hours. Determine

(a) Average failure rate of electric bulb

(b) MTBF

(c) Reliability of electric bulb for an operating time of 2000 hours

(d) Operating time corresponding to 70% reliability *10*

8. (a) What is a Bathtub curve ? Explain the reasons for its particular shape.

   (b) Determine the overall reliability of the following system if the reliability of each unit is 0·55.   5+5

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              B                      I
   o--[A]--[C]------[E]--[G]-[H]--[J]------o
              D      F               K
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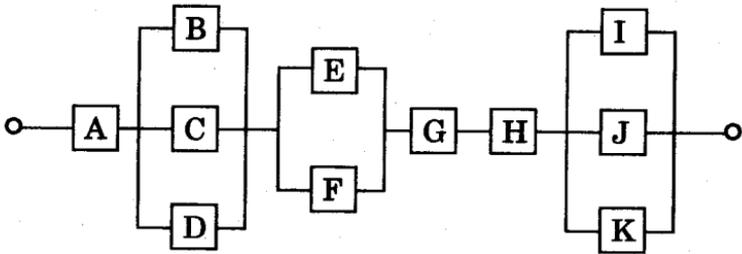
9. Write short notes on the following : $4 \times 2\frac{1}{2} = 10$

   (a) Kaizen

   (b) VED Analysis

   (c) Overall Equipment Effectiveness (OEE)

   (d) Maintenance Information System

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