Reg. No. : | | | | | | | | | | | |

K 6241

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Elective

Industrial Engineering

IE 1623 — ADVANCED MAINTENANCE MANAGEMENT

(Regulation 2005)

Three hours — Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the costs involved in any maintenance activity?
2. State the differences between MTTF and MTBF.
3. List out the losses considered in a TPM study.
4. What are the points to be considered to achieve zero breakdown?
5. What is meant by opportunistic maintenance?
6. Define Overall Equipment Effectiveness.
7. Write a few lines about system availability.
8. What are the benefits one would derive out of MMIS?
9. What is signature analysis? Where can it be used?
10. Indicate the important parameters used in the analysis of repair time distributions.

PART B — (5 × 16 = 80 marks)

11. (a) Explain clearly the need for TPM implementation in a manufacturing company. What are the benefits of adopting the TPM strategy?

Or

(b) Describe in detail the various functions of a Maintenance department.

12. (a) A firm is considering replacement of an equipment whose first cost is Rs. 2550 and the scrap value is negligible at any year. Based on the experience, it is found that the maintenance cost is zero during the first year and it increases by Rs. 150 every year thereafter. When should the equipment be replaced if

(i) interest rate $i = 0\%$.

(ii) $i = 10\%$?

Or

(b) A sample of 10 items is allowed to fail and the time for each failure is as follows: 4, 6, 8, 11, 12, 13, 15, 17, 20, 21 (thousand hours) Discuss how you would use this data to compute reliability with the help of Weibull paper.

13. (a) Derive system reliability equation of a two unit standby system.

Or

(b) Write notes on the following:

(i) PM schedules-deviations on both sides of target value

(ii) FMEA

14. (a) Define maintainability. What are the factors to be considered while designing for optimum maintainability?

Or

(b) Write short notes on the following:

(i) Reliability Centered Maintenance.

(ii) Expert systems in maintenance.

15. (a) The failure data of an electronic system is given below. Establish whether the system follows exponential distribution or not.

Time Interval	No. of failures
0-30 hrs	11
31-60 hrs	27
61-90 hrs	3
91-120 hrs	12
121-150 hrs	20

Or

Consider the probability density function

$f(t) = 0.002e^{-0.002t}$, $t \geq 0$

$= 0$ otherwise

Compute reliability R(t), MTTF and median time to failure.
