

**Z 6235**

B. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

*Elective*

Industrial Engineering

IE 1623 — ADVANCED MAINTENANCE MANAGEMENT

(Regulation 2005)

Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Define Teso technology.

What is the difference between a fault and a failure.

Define maintainability.

What is the significance of useful life in maintenance study?

What are the factors affecting inspection decisions?

State the meaning of imperfect maintenance with an example.

Define risk priority number.

List out the six big losses in TPM study.

Indicate the merits and demerits of expert systems.

What is RCM?

PART B — (5 × 16 = 80 marks)

(a) Discuss the step-by-step development of Autonomous maintenance.

Or

(b) Write short notes on :

(i) FMEA

(ii) OEE

12. (a) A large number of units were tested until all failed and failures were grouped into 5 time periods (in hours) as given below:

Time Interval	1 - 60	61 - 120	121 - 180	181 - 240	241 - 300
No. of failures	28	49	33	16	54

Test whether the data fit into the exponential distribution or not.

Or

- (b) The following repair times in hours were obtained as part of a maintainability demonstration on a new packaging machine.

7, 2-6, 7-8, 1-7, 5-4, 3-6, 4-9, 7-1. Estimate the cumulative repair-time distribution and construct a 90% confidence interval for the MTTR. If the MTTR is to be 4 hr and 90% of the repairs are to be completed within 10 hours, are the maintainability goals being met?

13. (a) Describe the type of maintenance organisation that would be best suitable for process industry.

Or

- (b) What are the various primary and secondary functions of a maintenance department? How would you carry out a maintenance planning task?

14. (a) Write short notes on :

- (i) Wear Debris Monitoring
- (ii) Signature analysis

Or

- (b) Explain the different techniques used in condition monitoring. Discuss the merits and demerits of applying each of these techniques.

The record for the past two years for an equipment has indicated as follows :

No. of break downs	0	1	2	3
No. of months this occurred	9	4	6	5

The average cost of repair inclusive of down time cost, has been found to be Rs.380 per breakdown. A preventive maintenance programme has been suggested at a cost of Rs.2500 per year with a view to limit the number of breakdowns to 2 per month. Determine whether the preventive maintenance programme could be accepted or not.

Or

A repairman services 3 machines. For each machine the time between service requirements is 8 hours following exponential distribution. The time of repair also has the same distribution with the mean of 2 hours. The downtime for a machine cost Rs.100 per hour. The cost of repairman is Rs.50 per day. Determine the expected of machines in operation and the expected cost of downtime per day.