

**M. TECH. IN PRINTING ENGINEERING AND GRAPHIC COMMUNICATION
FIRST YEAR 2ND SEMESTER EXAMINATION 2025
TOTAL PRODUCTIVE MAINTENANCE**

Time: 03 hrs

Full Marks: 100

Answer any five

1. a) Explain different types of maintenance techniques.
b) What is maintainability? How it is related to mean time to repair (MTTR)?

12+8=20
2. a) Define 'Availability'. Distinguish between Inherent Availability, Achieved Availability and Operational Availability.
b) Explain Downtime. What are the types of downtime?

10+10=20
3. a) "TPM is aimed for eliminating the six big losses" – What are six big losses? Define these.
b) Define Overall Equipment Effectiveness (OEE). Define and explain the factors associated with OEE. How these factors are related with OEE?

8+12=20
4. a) How can you assess the potential consequences of the total functional failure of a system?
b) How can you determine the total productivity of a printing plant?

10+10=20
5. Explain the steps involved for the implementation of TPM development program in an organization. Also mention the fundamental activities of TPM.

20
6. What is Risk Based Maintenance (RBM) methodology? How can you assess the risk by using RBM strategy?

10+10=20
7. a) What are the practical components of TPM to be achieved through maintenance team?

[Turn over

b) A four color web offset machine in a newspaper house had the following observations over an 8 hour shift.

- i) A total of five planned break times that amount to 50 minutes
- ii) 10 minutes of unplanned downtime due to tooling failure
- iii) Ideal rate of machine to run this part was determined to be 400 impressions per minute
- iv) 150,000 impressions actually produced over the 8 hour shift
- v) 25,000 impressions were scrapped due to be out of specifications.

Calculate OEE along with its each element and draw the corresponding effectogram.

$$5+15 = 20$$