Ref. No.: Ex/PG/PT/T/121C/2024

M. TECH. IN PRINTING ENGINEERING AND GRAPHIC COMMUNICATION
FIRST YEAR 2ND SEMESTER EXAMINATION 2024
TOTAL PRODUCTIVE MAINTENANCE IN PRINTING

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 are the interactively linked modules involved with the RBM methodology? Explain the modules which consist of different steps involved to reduce the risk through maintenance planning.

   20

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

[Turn over

b) A packaging company has a machine that makes caps and places them on bottles. A typical shift for this machine is 8 hours. During this shift, the technician running the machine takes 3 breaks for a total of 60 minutes. There are also two changeovers, one at the beginning and one at the end. During these changeovers, the technician completely shuts the machine down. These changeovers take 30 minutes total. The machine produced 18,600 capped bottles in one shift where 7 caps does not meet quality standards out of 47 caps. It typically takes two seconds to put one cap on one bottle.

Calculate each element of OEE and draw the corresponding effectogram.

5+15 = 20