22451

**21222**

**3 Hours / 70 Marks** Seat No. | | | | | | | | |

**15 minutes extra for each hour**

***Instructions :*** (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :** **10**

(a) State the importance and types of maintenance.

(b) Define pitting. State how it is occur.

(c) Write the causes of accident.

(d) Classify chemical hazards.

(e) Define safety audit.

(f) Write the benefits of TPM.

(g) State the effects of accident on employee (any two).

**2. Attempt any THREE of the following :** **12**

(a) Explain the procedure of preventive maintenance.

(b) Explain how the abrasive wear occurs in mating parts.

(c) State the important provisions to be made in Factories Act, 1948.

(d) State the causes of fire hazards. State the remedies to minimize it.

**3. Attempt any THREE of the following :** **12**

(a) Develop equipment card and history card for lathe machine.

(b) Compare breakdown maintenance and preventive maintenance.

(c) Explain wick lubrication system with neat sketch.

(d) List the types of industrial hazards. Explain ergonomic hazard.

**4. Attempt any THREE of the following :** **12**

(a) Suggest the relevant lubricant with justification for

(i) Milling machine used in normal weather.

(ii) Crankshaft for vehicle used in extremely cold weather.

(b) Write practical application of following lubrication systems :

(i) Pad

(ii) Bottle

(iii) Bath or sump

(iv) Centralised

(c) Suggest personal protective equipments in following industrial hazards :

(i) Mechanical

(ii) Radioactive

(iii) Electrical

(iv) Thermal

(d) Compare active and passive fire protection systems.

(e) Explain Failure Mode and Effect Analysis (FMEA).

**5. Attempt any TWO of the following :** **12**

(a) Explain following special fire suppression systems :

(i) Deluge and emulsifier

(ii) Foam system

(b) Prepare Safety Data Sheet (SDS) for

(i) Fire hazard

(ii) Chemical hazard

(c) Explain the following hazard identification method :

(i) Hazard Operability Study (HAZOP)

(ii) Hazrd Analysis (HAZAN)

**6. Attempt any TWO of the following :** **12**

(a) Suggest a suitable preventive maintenance plan for 20 kVA diesel generator.

(b) Select tools required for mechanical maintenance of shop floor of medium scale manufacturing company.

(c) Assess the risk associated with use of overhead cranes and prepare fault tree analysis.

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