Chapter 8: Waste Management

Repeated Questions:

1. Waste – Meaning and Classification:

- **Q.** Define waste. Classify waste in terms of industrial aspect. / Enlist the various kinds of waste. **(SUMMER 2024, 3 Marks; SUMMER 2025, 7 Marks; SUMMER 2026, 7 Marks)**

Answer:
Waste: Waste is any unwanted material or by-product generated during production or consumption that has no immediate value and requires disposal.

Classification of Waste (Industrial Aspect):

- **Solid Waste:** Scrap metal, packaging, rejects, sludge, ash.
- **Liquid Waste:** Effluents, coolants, oils, wash water.
- **Gaseous Waste:** Emissions, fumes, dust, smoke.
- **Hazardous Waste:** Chemicals, solvents, radioactive materials, toxic substances.
- **Obsolete Items:** Old machinery, spare parts, outdated inventory.
- **Process Waste:** Trimmings, off-cuts, defective parts, spillage.

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2. Obsolescence:

- **Q.** Give the reasons for generation and accumulation of obsolete items. / State and explain the causes of obsolescence. **(SUMMER 2023, 4 Marks; WINTER 2023, 3 Marks; WINTER 2024, 3 Marks OR)**

Answer:
Causes of Obsolescence:

- **Technological Change:** New machines/processes make old equipment or products outdated.
- **Design Changes:** Product redesign makes old components/spare parts unusable.
- **Changing Demand:** Shift in customer preferences renders old stock unsellable.
- **Overstocking:** Excess inventory purchased beyond requirement becomes obsolete.
- **Poor Inventory Control:** Lack of FIFO and monitoring leads to accumulation of old items.
- **Regulatory Changes:** New standards or laws make old products non-compliant.

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3. Identification and Control of Waste:

- **Q.** Write short note on 'Identification and Control of Waste'. / Discuss in brief about identification and control of waste. **(SUMMER 2022, 7 Marks; SUMMER 2023, 4 Marks OR; WINTER 2025, 7 Marks)**

Answer:
Identification of Waste:

- **Waste Audit:** Systematic survey of waste generation points, quantities, and types.
- **Process Mapping:** Tracking material flow to locate losses and leakages.
- **Record Analysis:** Reviewing rejection, scrap, and inventory data.
- **Observation:** Shop-floor inspection to identify spillage, idle material, and defective items.

Control of Waste:

- **Source Reduction:** Modify process to prevent waste generation (e.g., better tooling, training).
- **Reuse:** Reuse off-cuts, containers, and solvents where possible.
- **Recycling:** Reprocess scrap into usable material.

- **Proper Disposal:** Segregate and dispose hazardous/non-hazardous waste safely.
- **Inventory Control:** FIFO, optimum stock levels, and periodic review to avoid obsolescence.
- **Preventive Maintenance:** Reduce equipment-related waste and defects.
- **Employee Involvement:** Training and suggestion schemes for waste reduction.

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4. Need for Waste Management:

- **Q.** Briefly justify the need for waste management. / What are the ways of managing waste in industries? / Explain Waste management in Industries. **(WINTER 2022, 4 Marks; WINTER 2022, 3 Marks OR; SUMMER 2024, 3 Marks OR)**

Answer:

Need for Waste Management:

- **Environmental Protection:** Prevents pollution of air, water, and land.
- **Legal Compliance:** Meets statutory norms for waste disposal.
- **Cost Reduction:** Reduces material loss, disposal cost, and penalties.
- **Resource Conservation:** Recovers reusable/recyclable materials.
- **Worker Safety:** Proper handling of hazardous waste protects employees.
- **Corporate Image:** Demonstrates social responsibility and sustainability.

Ways of Managing Waste in Industries:

- Source reduction and cleaner production.
- Segregation of waste at generation point.
- Recycling and reuse of materials.
- Treatment of liquid/gaseous effluents before discharge.
- Safe disposal of hazardous waste.
- Inventory control to prevent obsolescence.

Other Important Questions:

None identified.

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