GUJARAT TECHNOLOGICAL UNIVERSITY

BE 6 SEMESTER – OLD PAPER – S22 TO S25 – QUESTION BANK

Subject Name & Code: Mine Hazards - 3162204

Chapter 1: Mine Fires

Repeated Questions:

1. Fire – Causes, Classes and Prevention:

- **Q.** Explain how fire can produce in mines and its effect in mines. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks)**
- **Q.** List out classes of fires and explain all in brief. **(SUMMER 2022, 4 Marks; WINTER 2022; WINTER 2023, 4 Marks; SUMMER 2024, 7 Marks)**
- **Q.** Explain the reason behind underground fires and its preventive measures. **(SUMMER 2022, 7 Marks OR; WINTER 2022 - reason-behind variant; WINTER 2023, 7 Marks OR)**
- **Q.** What do you mean by fire? Explain its causes and prevention in surface mines. **(SUMMER 2022, 4 Marks; WINTER 2022; WINTER 2023, 4 Marks)**
- **Q.** List out/write causes of mine fires. **(SUMMER 2023, 3 Marks; SUMMER 2024, 3 Marks; SUMMER 2025, 3 Marks)**

2. Fire Extinguishers:

- **Q.** List out different types of fire extinguisher. Explain any one/two types of fire extinguishers with neat sketch. [Diagram required – refer to the original question paper] **(SUMMER 2022, 7 Marks; WINTER 2022; SUMMER 2023, 7 Marks; WINTER 2023, 7 Marks; SUMMER 2024, 7 Marks OR; SUMMER 2025, 3 Marks; SUMMER 2025, 7 Marks OR)**
- **Q.** Discuss the uses of fire extinguisher. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks)**
- **Q.** Name the locations or places of portable fire extinguishers provided in underground mines. **(SUMMER 2023, 3 Marks; SUMMER 2024)**

3. Spontaneous Heating and Combustion:

- **Q.** Explain spontaneous heating, its causes and detection in underground mines. **(SUMMER 2022, 7 Marks; WINTER 2022)**
- **Q.** Describe the physical and chemical characteristics of coal liable to spontaneous heating. **(SUMMER 2022 - second set; WINTER 2022; WINTER 2023)**
- **Q.** Discuss the symptoms of spontaneous combustion. **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks)**
- **Q.** What do you understand by Graham's Ratio? Explain with example. **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks; SUMMER 2025, 4 Marks)**

4. Sealing Off and Reopening of Fire Areas:

- **Q.** Discuss the methods of sealing off the fire in underground coal mines. **(SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; SUMMER 2025, 7 Marks)**
- **Q.** Discuss the different methods for reopening sealed off area/working in mines. **(SUMMER 2022, 4 Marks - first set; WINTER 2022; SUMMER 2023, 7 Marks OR; WINTER 2023, 4 Marks)**

Other Important Questions:

1. Spontaneous Combustion:

- **Q.** Explain stages of spontaneous combustion. **(SUMMER 2025, 4 Marks)**
- **Q.** Explain detection and prevention of spontaneous heating. **(SUMMER 2025, 7 Marks)**

Chapter 2: Mine Explosions

Repeated Questions:

1. Firedamp Explosion – Explosibility, Coward's Diagram and Prevention:

- **Q.** Discuss the factor affecting the limit of explosibility in fire damp. **(SUMMER 2022, 3 Marks; WINTER 2022; SUMMER 2023, 3 Marks; WINTER 2023, 3 Marks; SUMMER 2024, 3 Marks)**
- **Q.** Describe the salient features of Coward's diagram with neat sketch / Explain Coward's diagram with sketch. [Diagram required – refer to the original question paper] **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks; SUMMER 2025, 4 Marks)**
- **Q.** What steps should be taken in a mine to prevent explosion of firedamp? **(SUMMER 2023, 3 Marks OR; SUMMER 2024, 3 Marks OR)**

2. Stone Dust Barriers and Explosion Investigation:

- **Q.** What do you mean by stone dust barrier? Explain the types of stone dust barriers with neat sketch. [Diagram required – refer to the original question paper] **(SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; SUMMER 2025, 7 Marks)**
- **Q.** Describe/discuss the procedure for investigations after an explosion. **(SUMMER 2022, 4 Marks; WINTER 2022; SUMMER 2023, 4 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 4 Marks)**

Other Important Questions:

1. Firedamp and Coal Dust Explosions:

- **Q.** Write causes of fire damp explosion. **(SUMMER 2025, 3 Marks)**
- **Q.** Define fire damp and coal dust explosion. **(SUMMER 2025, 4 Marks)**
- **Q.** Explain prevention of coal dust explosion. **(SUMMER 2025, 3 Marks OR)**

Chapter 3: Inundation

Repeated Questions:

1. Causes and Precautions of Inundation:

- **Q.** Explain causes and precautionary measures in mine inundations. **(SUMMER 2022, 7 Marks; WINTER 2022; WINTER 2023, 7 Marks)**
- **Q.** Discuss the main causes of accidents resulting in inundation in a mine. **(SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks)**
- **Q.** Discuss/state the precautions to be taken when approaching old workings / old working containing water / old water-bearing working. **(SUMMER 2022, 4 Marks - first set; WINTER 2022; SUMMER 2023, 4 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 4 Marks; SUMMER 2025, 4 Marks OR)**

2. Dewatering, Water Dams and Safety Dams:

- **Q.** Explain the method of dewatering a waterlogged working. **(SUMMER 2022, 4 Marks - second set; WINTER 2022; SUMMER 2023, 4 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 4 Marks)**
- **Q.** Explain the design and construction of water dams. **(SUMMER 2022, 7 Marks; WINTER 2022; WINTER 2023, 7 Marks; SUMMER 2024, 7 Marks OR)**
- **Q.** Write a note/short note on safety dams. **(SUMMER 2023, 3 Marks; SUMMER 2024, 3 Marks)**

Other Important Questions:

1. Inundation – Definition and Causes:

- **Q.** Define inundation and its causes. **(SUMMER 2025, 4 Marks OR)**

2. Dams and Safety Boring:

- **Q.** Write short note on water dam. **(SUMMER 2025, 3 Marks)**
- **Q.** Explain safety boring apparatus. **(SUMMER 2025, 3 Marks OR)**

Chapter 4: Rescue and Recovery

Repeated Questions:

1. Rescue Apparatus and Equipment:

- **Q.** Discuss the classification of rescue apparatus. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks)**
- **Q.** List out different types of rescue equipment used in mines. Explain any two with neat sketches. [Diagram required – refer to the original question paper] **(SUMMER 2022, 7 Marks; WINTER 2022; WINTER 2023, 7 Marks)**
- **Q.** Write a note on gas mask with neat sketch. [Diagram required – refer to the original question paper] **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks)**
- **Q.** Write a brief note on "Self rescuer" with neat sketch / Explain self-rescuer with neat sketch. [Diagram required – refer to the original question paper] **(SUMMER 2024, 7 Marks; SUMMER 2025, 7 Marks OR)**

2. Rescue Station and Rescue Room:

- **Q.** Describe the function of rescue station. **(SUMMER 2023, 3 Marks; SUMMER 2024, 3 Marks)**
- **Q.** Write a short note on rescue room. **(SUMMER 2023, 3 Marks - second set; SUMMER 2024, 3 Marks OR; SUMMER 2025, 4 Marks)**

3. Emergency Response and Recovery Work:

- **Q.** Explain the emergency preparedness and response system. **(SUMMER 2022, 7 Marks; WINTER 2022; WINTER 2023, 7 Marks)**
- **Q.** Explain rescue and recovery work in connection with mine fire. **(SUMMER 2022, 7 Marks; WINTER 2023, 7 Marks OR)**

Other Important Questions:

1. Rescue Apparatus:

- **Q.** What is a self contained breathing apparatus? Discuss about "Proto Mark IV" apparatus used in Indian mines. **(SUMMER 2023, 7 Marks)**
- **Q.** List out various rescue apparatus and write its uses. **(SUMMER 2025, 7 Marks)**

Chapter 5: Airborne Respirable Dust

Repeated Questions:

1. Dust Sampling and Measurement:

- **Q.** Explain the dust sampling methods. **(SUMMER 2022, 4 Marks; WINTER 2022; WINTER 2023, 4 Marks)**
- **Q.** Discuss the applications of dust sampling apparatus. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks)**
- **Q.** List out the devices used for dust measurement. **(SUMMER 2023, 3 Marks; SUMMER 2024, 3 Marks)**

2. Dust Suppression and Control:

- **Q.** Explain the mitigation measures taken to reduce dust generation in mines. **(SUMMER 2022, 7 Marks; WINTER 2022; WINTER 2023, 7 Marks)**

Other Important Questions:

1. Dust Formation and Effects:

- **Q.** Explain the reason behind formation of dust in underground mines and their effect on workers. **(SUMMER 2023, 7 Marks)**
- **Q.** Write physiological effects of dust. **(SUMMER 2025, 3 Marks OR)**

2. Dust Measurement and Prevention:

- **Q.** Explain measurement and prevention of dust in mine. **(SUMMER 2025, 7 Marks)**

Chapter 6: Illumination

Repeated Questions:

1. Illumination Standards and Devices:

- **Q.** Discuss/state the illumination/lighting standards in mining area given by DGMS / as required by the circular of D.G.M.S. / as per rule. **(SUMMER 2022, 3 Marks; WINTER 2022; SUMMER 2023, 7 Marks; WINTER 2023, 3 Marks OR; SUMMER 2024, 7 Marks; SUMMER 2025, 7 Marks OR)**
- **Q.** List out the different types of illumination devices. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks)**

2. Safety Lamps, Cap Lamps and Lamp Room:

- **Q.** Discuss the common types of safety lamps & their uses and limitations / List out various types of safety lamp and its uses. **(SUMMER 2022, 3 Marks; WINTER 2022; WINTER 2023, 3 Marks OR; SUMMER 2025, 3 Marks)**
- **Q.** Discuss the construction and advantages of electric cap lamp with neat sketch / Explain construction of cap lamp in brief. [Diagram required – refer to the original question paper] **(SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; SUMMER 2025, 4 Marks OR)**
- **Q.** How lamp room is designed and organized? **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks)**

Other Important Questions:

1. Safety Lamp Maintenance:

- **Q.** Explain maintenance and examination of safety lamp. **(SUMMER 2025, 7 Marks OR)**

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