

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, December 2021

M. Tech. in Health, Safety and Environmental Engineering, Semester First

Roll No.....

Course Code : ME2101

Time: 2.0 hours

Max. Marks: 40

Course Name: Industrial Safety Management

Instructions to students:

1. Do not write anything other than your roll number on the question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever required is an integral part of the answer.

Q.1	A road tanker-filled with strong caustic soda was parked in the tanks yard on the premises of a hazardous chemical factory at about 6:30 p.m. on working day. The general shift was over and most of the responsible senior persons had gone home. This delivery was expected earlier or if delayed, the next day. However, for reasons not communicated, the tanker was sent by the transport agent late in the evening. Not only was it allowed to center by the security but it was also allowed to unload by the production shift in-charge. The driver parked the vehicle in its usual place and went away, asking the cleaner to unload the chemical into the tank of the factory. The vehicle had a compressor on its chassis. However, a compressor from the maintenance department was used for decanting the chemical from the tanker truck to the static tank. The cleaner, who was standing on the body of the tanker, inserted the free end of the hosepipe, connected to the compressor, onto the protruding vent pipe of the tanker. The caustic soda was to be decanted from the tanker to the tank under compressed air pressure. With this arrangement, the cleaner shouted and signaled to the operator to start the compressor. The operator, without checking the procedures that were required to be followed, started the compressor. Within a minute or so, the hose end on the vent of the tanker body snapped off and the caustic solution splashed out, spurting all over the face and upper body of the cleaner who, at that time, happened to be leaning over the vent. Because of the sudden spray he panicked and jumped down to the ground. A few workmen who were working in the vicinity rushed to help the injured. They washed him with water through a hose, connected to a water tap nearby. They did spray water on his face but neither he nor the rescuers tried to open his eyes during wash. The chemical burns he sustained on his face, neck, shoulder, arms and chest were minor compared to his eye injuries. He sustained minor scratches and cuts on his legs and buttock because of jumping down onto the ground.	20
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	Proper first aid had not been administered to him the absence of a medical officer, nurse or a qualified first-aide. Most importantly, his eyes did not receive the adequate and timely first aid they required. Quick arrangement to take him to hospital to get him prompt medical treatment were not made. They first took him to a nearby clinic, where the doctor advised them to take him to a good hospital to ensure immediate treatment by an ophthalmic surgeon. In spite of that, it was almost six hours later that the injured was admitted and examined by a competent ophthalmic surgeon; who after a thorough examination and adequate tests, arrived at the conclusion that his left eye was completely damaged and offered no guarantee of any recovery of vision, even after performing surgery on that eye. However, the surgeon opened that recovery of partial vision of the right eye was possible and immediately operated on it. As predicted, the injured lost the use of his left eye completely and regained about 50% of the vision in his right eye. Q1.1. Identify the root cause for the accident. (4) Q1.2. Estimate the scheduled charges for the above accident disability as per Workmen's Compensation Act (India), 1923. (2) Q1.3. Explain the roles of the safety professional in anticipate, identify and evaluate hazardous conditions/practices and develop hazard control design methods, procedures & programme. (6) Q1.4. Develop the safety policy for the above facility to prevent the reoccurrence of such accident. (8)	
Q.2 LO-1 LO-3 LO-5 LO-6	Two operators were operating a Goliath crane in an engineering shop which manufactured mini-boilers. When the crane approached the location of a Jib Crane at the end of the huge shed, they heard a loud bang. The Jib crane had dislodged from its foundation and fallen down on its side with the base plate uprooted. It was reported by the operators that the boom of the Jib crane, which was moved by them earlier, was found in its steady position in the gap between the structural members of the Goliath crane and the shed. An unusual clear distance between the vertical structure member of the Goliath crane and the tilted boom of the Jib crane was observed. The plant manager and these skilled and experience operators decided to lift the Jib crane to make it stand erect. They first unloaded the element from the Goliath crane without moving the crane further to prevent it striking the Jib crane, it gave way completely from its foundation plate and collapsed on its own. The free end of the boom struck against the floor in the gap between two structural members. This time the boom brushed heavily against the vertical structural members of the Goliath crane and ultimately got jammed in between. Q2.1. Identify the possible cause of the accident. (5) Q2.2. Develop the safety programme and inspection maintenance programme for mechanical handling devices. (7) Q2.3. Write the structured exercise for investigation and prevention of accidents (8)	20

*****BEST OF LUCK*****