

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Theory Exam-III, December 2022
B. Tech. (All Branches), Open Elective, 2022-23

Roll No.....

CE2204: Safety in Construction and Mining

Time: 2.5 hours

Max. Marks: 35

Instructions to students:

1. Do not write anything other than your roll number on 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 are an integral part of the answer.
 4. Answer ALL the questions.
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Q.1 Assume that you are a safety officer in a railway construction site located in a hilly area comprising of expansive soil. On account of heavy rains, the soil grain tends to expand nine times the actual diameter making the construction difficult. Elaborate on the safety practices you will implement while the construction is to be carried out in rainy weather.

8 marks
(LOs 3, 4 & 5)

2(a). A project has been approved for the construction of 12-storey building to allocate space to offices and restaurants. The construction site is very crowded, surrounded by similar 12 and 13-storey structures. As the construction work begins, mention the names of safety equipment you (as a safety inspector) would introduce to the site workers and their purposes.

5 marks
(LOs 4 & 5)

2(b). A 15-storey residential building was illegally constructed. The overall construction was completed within 1.5 years. The building was later expanded vertically to 19-storeys after 1 year. After approximately 9 months of the construction of the remaining 4 floors, cracks were noted to appear in the lower floors. These cracks were on account of uneven settlement caused due to relatively lesser bearing capacity of the soil. As the building was constructed in an illegal site, mention the safety measures that you, a site safety officer, would take to demolish this 19-storey residential building considering the uneven settlement.

4.5 marks
(LOs 3 & 6)

Q.3 (a) The steps for risk assessment and risk management in iron ore mines are as follows:-

- i. Hazards identification
- ii. Ranking of hazards as per their probability and consequence
- iii. Management of hazards as per their ranking

Prepare the risk rating matrix for the major risks that you have identified related to Iron ore mining and also predict the ranking of hazards as per their probability and consequence.

4 Marks
(Los 2,3,5)

Q.3 (b) Draw the systematic flow chart of HAZOP (Hazard and operability analysis) Concept. Suggest how will you examine all the possibilities to identify and processes that can malfunction or be improperly operated. Illustrate the concept with the help of any case or example in coal mining operations.

3.5 Marks
(Los 1,4,5)

Q.4 (a) How will you conduct accident investigation in coal and lignite mines in order to ensure reduction in accidents ? Outline the different steps involved in accident site inspection and collection of primary data.

4 Marks
(LOs 4,5,6)

Q.4 (b) Draw the format for Accident reporting based on Root Cause Analysis with reference to accident investigation in coal mines.

3.5 Marks
(Los 4,5)

Q. 5 (a) Illustrate the impacts of tailing impoundments, waste rock, heap leach, and dump leach facilities in different mining operations.

2.5 Marks
(LOs 2,6)