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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

END TERM EXAMINATION AUGUST -2024

Even Semester: 2023 - 24

Course Code: CIV 5009

Course Name: Mechanization in Construction

Program & Sem: M.Tech BCT

Date: 14 / 08 /2024

Time: 09:30 AM to 12:30 PM

Max Marks: 100

Weightage: 50%

Instructions:

- (i) Read the all questions carefully and answer accordingly. All parts are compulsory.
(ii) Do not write any information on the question paper other than Roll Number.

Part A [Memory Recall Questions]

Answer any 3 Questions. Each question carries 5 marks.

(3Qx 5M= 15M)

1. Differentiate Precast Footing with Cast – in – situ footing. [5M] (C.O.No.2) [Knowledge]
2. Define: (i) Dislodging and (ii) Securing in tunneling. [5M] (C.O.No.3) [Knowledge]
3. Describe Slewing unit and Luffing Jib in a Tower Crane. [5M] (C.O.No.3) [Knowledge]
4. What are Flat Slabs? Mention its types? [5M] (C.O.No.2) [Knowledge]
5. Identify any 5 points on the safety precautions while blasting. [5M] (C.O.No.4) [Knowledge]

Part B [Thought Provoking Questions]

Answer any 4 Questions. Each question carries 10 marks.

(4Qx10M=40M)

6. Tower cranes are the tall, heavy machines used in mega constructions for transporting and lifting capacity from one place to another. Based on the different types of Tower cranes present in the market, explain (i) Hammerhead Crane and (ii) Deck crane.

[10M](C.O.No.3) [Comprehension]

7. 3D Monolithic Volumetric construction (also known as modular construction) involves production of three-dimensional modular units in controlled factory conditions prior to transportation to site. According to the construction requirement, explain the use of Modular construction and how the modules are fixed at the site. [10M](C.O.No.2) [Comprehension]

8. Like many labor-intensive jobs, there are a few occupational safety hazards of working in the concrete construction industry. Concrete supply company has taken many necessary measures to eliminate the potential dangers that exists at site. Assuming that you are an employee in the company, how would you explain the concreting hazards and their risks to the workers.

[10M](C.O.No.1) [Comprehension]

9. Flat slabs are gaining entry into many of the construction places due to its aesthetics appearance and properties. How is a flat slab different from conventional slabs? Why do we provide a drop panel in Flat slabs?

[10M](C.O.No.2) [Comprehension]

10. According to the WHO, sound levels more than 70dB leads to adverse effects in humans. With regard to the growth in mechanization in the construction industry, what are the sources, effects and preventive measures of noise pollution?

[10M](C.O.No.4) [Comprehension]

11. Robotics arms, also called articulated robots, are the backbone of manufacturing, machinery, and industrial automation. Explain Single task construction robots (STCRs) and Construction Exoskeletons.

[10M](C.O.No.4) [Comprehension]

Part C [Problem Solving Questions]

Answer any 3 Questions. Each question carries 15 marks.

(3Qx15M=45M)

12. Drill and blast techniques are the most convenient and common method used in all underground mining operations. Most blasting patterns and techniques rely on the first sequence of blasts to open 'a cut' in the face essentially creating another free face and a route for the rock at depth to escape into. With this regard, describe the different drilling patterns referring to the initial 'cuts' which are then blasted into surrounding holes. Also draw neat diagrams with suitable labelling.

[15M](C.O.No.2) [Comprehension]

13. Safe construction practices should be followed while carrying out any construction. Keeping in mind the construction aspects, explain trenchless technology and box pushing technology.

[15M](C.O.No.4) [Comprehension]

14. Tower cranes are essential for moving heavy goods, materials or tools around a site. It is found to be efficient for speeding up construction, keeping up the schedule and cutting costs of time and manpower in the process. Explain each component of the Tower crane and mention the advantages of using the tower crane.

[15M](C.O.No.3)[Comprehension]

15. The twin wall technology is a hybrid solution of wall system that combines the qualities of erection speed and precast concrete with the structural integrity of in-situ concrete. Peter wants to execute one of his projects using the technology. Write the step – by – step procedure he would use to erect this wall system. What are the advantages of Twin - wall system over the conventional system?

[15M](C.O.No.2) [Comprehension]

16. Automation in construction is the combination of methods, processes, and systems that allow for greater machine autonomy in construction activities which creates great impact and Opportunities of automation in Construction. Elaborate on the same in detail with 2 examples.

[15M](C.O.No.4) [Comprehension]