

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

MTech - II Semester (CM)

COURSE CODE(CREDITS): 10MI1CE212 (3)

MAX. MARKS: 25

COURSE NAME: Heavy Civil Construction Equipment, Methods, and Management

COURSE INSTRUCTORS: Saurabh Rawat

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1) Calculate the hourly ownership cost for the second year of operation of a 465 hp twin-engine scraper. This equipment will be operated 8 h/day and 250 days/year in average conditions. Use the sum-of-years-digits method of depreciation for the following information:

Parameter	Value
Initial cost	₹ 18600
Tire Cost	₹ 14000
Estimated Life	5 years
Salvage value	₹ 22000
Interest on the investment	8%
Insurance	1.5%
Taxes	3%
Storage	0.5%
Fuel price	₹ 2.00/gal
Operator's wages	₹ 24.60/hour

CO3[5]

Q2) Elaborating the principles of 'Caterpillar Method', explain how the method is used for calculating the 'ownership cost' of a 150-t truck crane. CO3[5]

Q3) With the help of a diagram, explain the construction of an under – reamed pile. CO4 [3]

Q4) A 140H motor grader with a 3.66 m (12 ft) moldboard is performing road maintenance on a township road. The machine is working at an average speed of 13 km/h (8 mph) with a moldboard carry angle of 60°. What is the motor grader's production (m²/hr) based on coverage area? Take: Job efficiency of 0.90 and effective blade length is 3.17 m (10.4 ft).

CO3[5]

Q5) The fixed cost for the year 2023-2024 is ₹ 60,000. The estimated sales for the period is ₹ 2 lakhs. The variable cost per unit for the single product made is ₹ 5. If each unit sells at ₹ 25 and number of unit input value coincides with the expected value of output, then determine:

- a) Breakeven point
- b) The profit earned at the turnover of ₹ 1,25,000
- c) Margin of safety

CO3, CO4[3+2+2=7]