JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

MTech - II Semester (CM)

COURSE CODE(CREDITS): 10M11CE212

MAX. MARKS: 35

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

COURSE INSTRUCTORS: Saurabh Rawat

MAX. TIME: 2 Hours

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. A contractor has planned a blasting program in slightly weathered Gneiss having a specific gravity of 2.6. The contractor intends to use poured ANFO having a specific gravity of 0.85. the drill hole is 3 – inch in diameter. What is the recommended and corrected burden distance for the trial shot? Given: Correction factor for rock deposition = 1.18; Correction factor for rock structure = 1.30.

$CO5$ [3+2 = 5]

Q2. A hauler of capacity of 20 bank cubic yards has a haul length of 1300 ft with a loading time (L) of 3.0 min and variable time (V) of 4.0 min. Compute the sustained cycle time, the optimum number of hauling units (N), and sustained production rate. Given: Shift – 8 hours; Waste time (W) = 2.0 min per cycle.

$CO3$ [2+2+2 = 6]

Q3. In reference to the cost of owning and operating a construction equipment, define the term 'Depreciation'. What do you understand by 'Straight-Line Depreciation', 'Sum-of-Years'-Digits Depreciation' and 'Double-Declining Balance Depreciation'.

$CO1$ [1+2+2+2 = 7]

Q4. Define a 'cut' in underground drilling? With the help of a diagram, explain the difference between a 'Wedge cut' and 'Burn cut'.

$CO5$ [2+3 = 5]

Q5. With reference to the earthmoving and excavation equipment, describe the construction sequence along with the equipment used during foundation excavation and backfilling process. $CO2$ [5]

Q6. A Cat 320C excavator equipped with a 1.96 lcy heaped bucket is used to dig in sandy clay soil. It takes about 0.33 min per bucket load dumped into a fleet of Cat D30D articulated trucks. Each truck carries a heaped capacity of 21.6 lcy. It takes about 5 min to haul and dump the load, return and position for reloading.

    a) How long does it take to load one D30D? (Assume the bucket fill factor for the sandy clay is approximately 1.0.)

    b) How much dirt can be hauled in 1 work hour by one D30D?

    c) How many D30Ds will the 320C support?   *CO3; CO4* [3+2+2 = 7]