Anil Kumar

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATION, JUNE-2016
M.Tech. (CM), II Semester and B.Tech. (Civil), VIII Semester

COURSE CODE: **10M11CE212** MAX. MARKS: 35
COURSE NAME: Heavy/Civil Construction Equipment, Methods and Management
COURSE CREDITS: 03 MAX. TIME: 2 HRS

Note: *All questions are compulsory. Marks are indicated against questions.*
Carrying of mobile phone during examinations will be treated as case of unfair means.

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1. Calculate the tractive effort generated by a 92,000 *lbs* (pounds) loaded scraper travelling on a maintained dirt haul route where the tires sink about 2 inches into the travel surface. Further, if the scraper needs to haul up a 3% grade, calculate the total resistance faced if the required tractive effort increases or decreases 20 *lbs* per gross *ton* of weight for each 1% of grade. Given: Rolling resistance = 50 *lbs/ton* and Penetration resistance = 30 *lbs/ton*/inch. **[6]**

2. List various types of drills. What is an abrasion drill? Give its three types with respective characteristics. **[6]**

3. What are the adverse impacts of blasting in open pits, quarries, tunnels, etc.? List the techniques of controlled blasting generally used to mitigate these adverse impacts and describe any two of them. **[6]**

4. Give examples of equipment-intensive horizontal construction projects. Explain the precedent diagramming method (PDM) with a simple 3-activity cable-laying project (trenching-3 days, installation-5 days, and backfill-2 days). Give the flow chart for linear and parallel work sequences. **[6]**

5. Discuss the applications of probability theory in construction equipment production system analysis. To move from a deterministic equipment production model to a stochastic one, what does the estimator need to do? **[6]**

6. A bulldozer is used normally for five 10-hour shifts per week for 50 weeks each year. In the past three years, it has been unavailable because of breakdown, routine maintenance, and servicing 44 hours in year-1, 150 hours in year-2, and 163 hours in year-3. The earthmoving crew to which it is assigned has a sustained production rate of 2000 cubic yards per day assuming 100% availability. Find the estimated production rate for a project that will last for one year based on the data given. **[5]**

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