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ET-581(F)

B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2015

00425

ET-581(F) : MECHANICAL EQUIPMENT IN CONSTRUCTION

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **ten** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. What cost components will you consider in deciding the cost of owning and operating an equipment ? Discuss the procedure to get the cost of owning and operating. 7

2. How is the size of a power shovel selected in a project ? Define the output of a power shovel and list down the factors which affect the output. 7

3. Justify the fact that a bulldozer is a versatile construction equipment. Define the output of a bulldozer and discuss the factors which affect it. 7

4. What are the advantages and disadvantages of a dragline over a power shovel ? Describe the basic parts of a dragline with the help of a suitable diagram. 7

5. What are the advantages and disadvantages of a belt conveyor system ? Show their basic parts and discuss their functions. 7

6. Explain the blasting operation and show the sketches for various arrangements of blasting operation. 7

7. What is the basic purpose of screening ? Describe revolving, shaking and vibrating screen. 7

8. What is the purpose of grouting ? How will you ascertain that the foundation needs grouting ? Name the materials used for grouting. Show a typical cement grouting unit by a sketch. 7

9. The initial cost of an equipment is ₹ 11,000 and salvage value is ₹ 1,000. Life of the equipment is 5 years. The rate of interest for sinking fund is 8%. Calculate the yearly depreciation and book value at the end of each year by the following methods : 7

(a) Straight line method

(b) Sum of the year's digits method.

10. Enumerate the factors in selecting a pump. Differentiate clearly between a Reciprocating pump and a Centrifugal pump. 7

11. Determine the output of a bulldozer for the following situation : 7

(a) Material handled sandy loam top soil having swell = 30%

(b) Haul distance = 45 m

(c) Rated mold board capacity = 4 cu.m. loose volume

(d) Actual operating time per hour = 50 minutes

(e) Forward speed = 3·0 km per hour

(f) Reverse speed = 6·0 km per hour

Assume G (Gear shifting time) = 0·45 minutes.

12. Estimate the number of dump trucks required for transportation of 1620 cu.m. of material per day for average lead of 6 km with the following data :

Capacity of one dump truck = 24 cu.m.

Speed during empty haul @ 30 km/hr and loaded haul @ 24 km/hr

Loading time for one dump truck = 12 minutes

For estimating purposes, actual working period is considered as 45 minutes per hour and six hours working period in a day. Also assume other fixed time = 1 minute per cycle. *7*
