

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

00195

Term-End Examination

December, 2014

**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. List down the factors which affect the selection of a construction equipment. 7

2. Differentiate between any **two** of the following : $2 \times 3 \frac{1}{2} = 7$
 - (a) Standard equipment and Special equipment
 - (b) Rolling resistance and Coefficient of friction
 - (c) Draw-pull and Rim-pull

3. Show the basic parts of a power shovel on a neat sketch and describe its operation. 7

4. Enumerate the factors which affect the output of a dragline. 7

5. Compare the following (Any **one**) : 7
- (a) Cable controlled bulldozer and Hydraulic controlled bulldozer
- (b) Wheel mounted bulldozer and Crawler mounted bulldozer
6. Discuss the different types of equipment used for concreting operation explaining working principle of each type. 7
7. Enumerate the precautions required for any **two** of the following : $2 \times 3 \frac{1}{2} = 7$
- (a) Concreting in very hot weather
- (b) Concreting in very cold weather
- (c) Concreting under water
8. Discuss the various means for hauling the materials. 7
9. What are the different types of crate ? Explain briefly the use of each type. 7
10. The initial cost of an equipment is ₹ 12,000. Salvage value = ₹ 2,000, life = 5 years, $i = 8\%$. Find the depreciation for the third year and the book value at the end of the third year by the following methods : 7
- (a) Declining balance method
- (b) Sinking fund method

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

- (a) Material handled sandy loam top soil having swell = 25%
- (b) Haul distance = 30 m
- (c) Rated mold board capacity = 3 cu.m. loose volume
- (d) Actual operating time per hour = 45 minutes
- (e) Forward speed = 2.4 km per hour
- (f) Reverse speed = 6.0 km per hour

Assume G (Gear shifting time) = 0.30 minutes.

12. Estimate the number of dump trucks required for transportation of 1125 cu.m. of materials per day for average lead of 5 km with the following data : 7

Capacity of one dump truck = 15 cu.m.

Speed during empty haul @ 25 km/hr

Loaded haul @ 20 km/hr

Loading time for one dump truck = 10 minutes.

For estimating purposes, actual working period is considered as 50 minutes per hour and six hours working period in a day.

Also assume other fixed time = 3 minutes per cycle.
