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

Term-End Examination
December, 2011

ET-581(F) : MECHANICAL EQUIPMENT IN CONSTRUCTION

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer* ***any seven*** *questions. All questions carry* ***equal*** *marks. Use of scientific calculators is allowed.*

1. (a) Enlist various types of excavating equipment.   5

   (b) Discuss in brief the economic life of construction equipment.   5

2. (a) Explain the factors to be considered in selecting the size of a Power Shovel.   5

   (b) Determine the expected production of a power shovel as per the following data.   5

      Ideal production = 206 m³ (bank)/hour

      size of bucket = 1.14 m³

      Actual depth of cut = 3.15 m

      optimum depth of cut = 2.1m

      Actual angle of swing = 75°

Class of material : Sand and gravel
Job and Management factor = 0.81
Working time = 50 min per hour.
Conversion factor for DOC and AOS
= 0.935

3. (a) Give a brief account of different types of   5
         cranes used in construction projects.

    (b) Describe any one safety devices provided in   5
         an elevator.

4. (a) Derive the Equation for calculating power   5
         required to drive a belt conveyor.

    (b) A 4 - ply, 900 gm weight, 150 m long (L) or   5
         500 mm wide belt on a conveyor, up a 20%
         slope is to be used to transport 250 tph of
         125 mm unsized gravel weighing
         2000 kg/m^3. Using 12.7 mm idlers.
         Determine the power required to operate the
         belt. Take pulley friction and drive losses
         at 5 and 10% respectively of total power
         required.

5. (a) Explain how pneumatic-tyred rollers are   5
         useful in earth compaction ?

    (b) Explain the working of a vibrating plate   5
         compactor.

6. (a) Give a brief account of important factors to   5
         be considered in the usage of concrete
         mixers.

    (b) Explain various components of a cable way.   5

7. (a) Write any two conditions favouring the use of an Internal Vibrator. 5

    (b) Explain the measures to be taken for maintaining a concrete vibrator in a good condition. 5

8. (a) With the help of a neat sketch, explain the working of a Jackhamer. 5

    (b) What do you understand by depreciation ? Explain the straight line method of calculating it. 5

9. (a) Explain basic difference between gates and valves, briefly. 5

    (b) Give a brief account of control equipment for outlets and spillways. 5

10. Write short notes on *any five* of the following : 5x2=10

    (a) Methods of reducing accidents.

    (b) HOE - operations.

    (c) Front-end loaders.

    (d) Idlers

    (e) Impact rollers

    (f) Aggregate Cooling

    (g) Tipping wagons

    (h) Delay detonators.