(REVISED COURSE)

Master

(3 Hours) [Total Marks : 100

N.B. (1) Question No. **1** is **compulsory.**
(2) Answer any **four** out of remaining **six** questions.
(3) Figures to the **right** indicate **full** marks.

B.E. (CC) VII Rev Const. Engg. 28/12/17

1. (a) A $3m^3$ hydraulic Loader is being used for loading the excavated muck on a construction project site. The cycle time of loader is 0·5 minutes and its operating factor is 0·7. Trucks of $8m^3$ and $12m^3$ capacities with cycle times of 12 minutes and 15 minutes, respectively, are available at the rates of Rs. 1,000 per hour and Rs. 1,200 per hour. The operating cost of loader is Rs. 2,400 per hour– **10**
   (i) Determine the most ideal combination of trucks to minimize the cost.
   (ii) Workout the cost of earth moving per m^3.
   (b) What is vacuum concreting ? Discuss step by step procedure of vacuum concreting. **10**

2. (a) Determine the probable cost of owning and operating an equipment purchased for Rs. 40 lakhs. It has a useful life of 18000 hours. Salvage value is estimated at 10% of the purchase cost. The equipment is powered by a 150 bhp diesel engine. The equipment works for 2000 hours in a year. The operating factor is 0·7. The maintenance and repairs cost is estimated at 100% of depreciation. The operators salary is Rs. 12,000 /-. **12**
   (b) Discuss step by step procedure of bored cast-in-situ pile construction. **8**

3. (a) Discuss the necessity and advantages of the use of plant and machinery in construction projects. **10**
   (b) Explain the Needle beam method of funnelling in soft soils. **10**

4. (a) Write a report on visit to a concrete road construction site. The road is 6 lanes, 20 km long. Discuss mainly : **12**
   (i) Pavement details
   (ii) Construction methods
   (iii) Equipments on site.

   (b) Discuss different methods of under water concreting. **8**

5. (a) Suggest suitable machinery for the following works. Justify the use of each equipment– **12**
   (i) Road earth work, 5 km long
   (ii) Concreting for a high rise building, 50 storeyed
   (iii) Flyover construction in sub-urban area = 500 m span.
   (b) Draw only sketches : **8**
   (i) Sand drains
   (ii) Diesel pile hammer.

6. (a) What is meant by living of a tunnel ? Discuss different methods of lining. **10**
   (b) A 5 km long tunnel is to be constructed through hard rock in 18 months. The cross-sectional area is approximately 70 sqm. Suggest the suitable tunneling method with step by step procedure and the equipment required. **10**

7. Write short notes on (any **four**) :– **20**
   (a) Grouting and its applications
   (b) Cofferdam
   (c) Well point system
   (d) Tunnel boring machine