

B.Tech. Civil (Construction Management)

Term-End Examination

December, 2017

00667

**ET-523(B) : OPERATION AND MAINTENANCE OF
CONSTRUCTION EQUIPMENT**

Time : 3 hours

Maximum Marks : 70

Note : Answer any seven questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Given that the throat and inlet diameters of a venturimeter are 0.20 m and 0.60 m respectively, and the differential head is 0.25 m, find the discharge through the jetting nozzle. Take $C = 0.9615$.
- (b) In case of pile driving given that, $W_H = 8$ t, $W_p = 24$ t, height of drop = 6 m and number of blows is 15 per minute, determine the efficiency of the blow, where W_H = mass of the hammer head, W_p = mass of the pile. 5+5

2. (a) Calculate the specific speed of a pump delivering 18 cumec of water under a head of 50 m while rotating at 4500 rpm.
- (b) How many litres of water will be pumped per minute by a duplex double-acting reciprocating pump, size 30 cm (diameter) \times 60 cm, driven by a crankshaft making 240 rpm ? Assume a water slippage of 3%. 5+5
3. (a) What are the main objectives of inspections ? Describe the four major types of inspection.
- (b) What are the relative advantages and disadvantages of single acting steam hammers over drop hammers ? 5+5
4. (a) What do you understand by positive displacement pumps ? Explain how pumps are classified on the basis of operating principles.
- (b) Describe the working principle of a centrifugal pump with the help of a neat sketch. 5+5

5. (a) How are air compressors classified ? Explain the working of stationary and portable compressors.
- (b) What is an Axial Compressor ? Describe how reciprocating compressors work. 5+5
6. (a) With the help of an illustration, explain the purpose of any construction organisation chart.
- (b) Why do breakdowns occur in construction equipment and how will you handle breakdowns ? 5+5
7. (a) How do health hazards occur and how can they be avoided on a construction project ?
- (b) List the problems in planning the power supply to construction project. What measures can be taken to avoid these problems ? 5+5
8. (a) What is spare parts inventory ? List the various costs associated with it. How do you maintain the spare parts inventory to minimize the cost of the inventory for a particular construction project ?

(b) For a particular construction project, write the general rules you will follow for replacing of an equipment. 5+5

9. (a) What factors affect the productivity of a machine ? What role do operating conditions play on machine productivity ?

(b) Describe in detail, the Insurance used in a construction project. 5+5

10. (a) What features are checked in daily maintenance and inspection in the following ?

(i) Tyres

(ii) Engines

(iii) Batteries

(b) What is POL ? Why should a record of POL be maintained ? 5+5
