

Total No. of Questions : 12]

SEAT No. :

P3337

[Total No. of Pages : 3

[5353]-502

T.E. (Civil)

**INFRASTRUCTURE ENGG. & CONSTRUCTION TECHNIQUES**

(2015 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6, Q.7 OR Q.8, Q.9 OR Q.10 and Q.11 OR Q.12.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume, suitable data, if necessary.

Q1) Explain the salient features of smart city. [6]

OR

Q2) Define and give features of Bus rapid transit system. [6]

Q3) a) Define the terms : [4]

- i) Equilibrium speed,
- ii) Equilibrium cant,
- iii) Cant deficiency,
- iv) Cant excess.

b) What is Track Maintenance? Explain in brief concept of Directed Track Maintenance (DTM). [4]

OR

Q4) a) Define following terms : [4]

- i) Tongue rail
- ii) Stock rail
- iii) Crossing
- iv) Points

b) How the Maximum Permissible Speed on Transitioned Curves is determine by Indian Railway Formula. [4]

P.T.O.

**Q5)** What is Diaphragm walls? Explain its construction methods. [6]

OR

**Q6)** What is Grouting? Explain grouting methods in soft soil. [6]

**Q7) a)** State the various methods of tunneling in soft ground. Explain NATM in brief. [6]

b) What is Mucking? State various methods of mucking and explain any one in detail. [6]

c) Write a short note on TBM. [4]

OR

**Q8) a)** List the tunneling Methods in soft soil. Explain in brief earth pressure balance method of tunneling. [6]

b) Give the types and methods of Tunnel ventilation and explain any one detail. [6]

c) Write a short note on Micro tunneling. [4]

**Q9) a)** What are the various points to be considered for selection of a site for Harbour? Explain any two in detail. [6]

b) List various components of the port. Explain any two components in detail. [6]

c) Define breakwater. What is the necessity of breakwater? [4]

OR

**Q10) a)** Define Dock. Differentiate between Wet Dock and Dry Dock. [6]

b) State the general sequence of operation for driving tunnels through hard rock. [6]

c) Define the following terms : [4]

i) Fenders

ii) Dolphins

- Q11)a)** List and Explain the selection criteria for cranes. [6]
- b) Write short note on, Economic maintenance & repair of construction equipment. [6]
- c) List the factors to be considered for calculation of output estimation of equipment? Explain any two in detail. [6]

OR

- Q12)a)** Write short note on, [6]
- i) Tower Cranes
- ii) Hoisting Equipments
- b) What are the various factors that are considered for selection of an equipment for project? Explain any two giving examples. [6]
- c) A shovel with 3 cubic yard heaped capacity bucket is loading well blasted rock on a highway project. The average face height is expected to be 22 ft. The shovel has a maximum rated digging height of 30 feet, with Optimum height of 50%. Most of the cut will require a 140 degrees swing of the shovel to load the haul units. What is a conservative production estimate in bank cubic yards, if the ideal cycle time is 21 sec? [6]

Percentage of optimum depth	Angle of Swing (degrees)					
	46	60	75	90	120	150
120	1.2	1.11	1.03	0.97	0.86	0.77
140	1.12	1.04	0.97	0.91	0.81	0.73
160	1.03	0.96	0.9	0.85	0.75	0.67

(Note - Assume efficiency 30 minutes per hour, Swell factor for rock = 0.63, Bucket Fill factor 110% for well blasted rock.)

