Total number of printed pages: 2

D/5th Semester/DCE501

2023

CONSTRUCTION TECHNOLOGY

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. a) Draw a typical cross section of a road in embankment showing carriage way, formation width, sides slopes, berm, longitudinal drain and right of way. While drawing carriage way, indicate the camber and the typical slope of camber. 6+2=8

   b) Draw typical cross sections of a flexible and a rigid pavement by labelling (i.e., naming) the layers in each type. Name the materials typically used to construct these two types of pavements. 3+3+2=8

   c) How is a WBM road different from a soil and a gravel road? 4

2. a) Describe with sketches the alternate bay and continuous bay methods of constructing a concrete pavement. Describe the advantages and disadvantages of each method. 8+4=12

   b) Draw sketches to show the trench type and feather edge type construction of pavement. 4

   c) Name the different types of naturally available and industrially produced bitumen. 4

3. a) Name two broad categories of mobile machinery used at construction sites. Provide a list of machineries typically used for site clearing and earthwork in excavation. 4+4=8

   b) Write down the difference between any two of the following three: (a) a dozer and a shovel, (b) a grader and an excavator, (c) a dragline and a shovel, based on the operations for which these are employed at construction sites. 4+4=8

   c) What are different types of roller compactor? 4

4. a) What is the distance between the running inner faces of two rails of a broad-gauge railway track? At what slope is the rim of the wheel of a railway vehicle is coned? Why is the flange of railway wheel important? 2+2+2=6

   b) Why are sleepers provided, and what are functions of ballasts in a railway track? Draw a cross section of a railway track. 4+4+4=12

	c)	How is the reinforced concrete ballastless track bed for Mumbai-Ahmedabad Bullet Train (as shown on projector in your class) different from a conventional rail track?	2
5.	a)	Classify bridges according to (i) materials of construction and (ii) structural action. Draw a schematic diagram of a beam bridge and label its different parts.	4+4=8
	b)	Referring to the Dhubri-Phulbari bridge (that you visited) and the satellite imagery of the bridges across the Brahmaputra River that was showed in your class, write down the requirements for selecting a good site for a bridge across a river.	4
	c)	Draw a labelled sketch to show the different parts of a well foundation of a bridge. Name and provide schematic diagrams of three major types of caissons.	2+6=8
6.	a)	Describe any two methods of temporary river diversion for constructing a dam.	8
	b)	Describe any six criteria for selection of a site for constructing a dam.	6
	c)	What are the problems that may occur with the construction of a dam?	6
7.	a)	Draw sketches of a overflow and a non-overflow section of a gravity dam. Draw liens to show the different levels and name the storages on the reservoir side of any of these two cross-sections.	6+4=10
	b)	List the different modes of failure of a concrete gravity dam. What is the middle-third rule for the safety of a concrete gravity dam?	6+2=8
	c)	What is the function of a drainage gallery in a concrete gravity dam?	2
8.	Describe <u>any four</u> of the following by providing sketches wherever necessary:		4×5=20
	a)	Types of earth dams and drawings of their sections	
	b)	Modes of failure of an embankment dam	
	c)	The phreatic line and the flow net in an embankment dam	
	d)	Methods of controlling seepage through the body of an embankment dam.	
	e)	Methods of controlling seepage through the foundation of an embankment dam	

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