

THEORY

WEEK	CONTENT NO.	LESSON NO.	CLASS/ QUIZ TEST	BRIEF DESCRIPTION OF CONTENT
01	1.1-2.2	01		1.1 Classify transportation. 1.2 Explain the importance of transportation. 1.3 Mention the benefits of good road system. 1.4 Describe in brief the history of road development. 1.5 Mention the characteristics of important early roads. 1.6 Describe the macadam and telford road construction. 2.1 Explain the importance of highway planning. 2.2 Mention the objectives of highway planning.
	2.3-3.6	02		2.3 Classify the road according to location & functions: 2.4 Mention the objectives of road planning & survey. 3.1 Define alignment of road. 3.2 Mention the fundamental principles of alignment of road. 3.3 Mention the factors that controls the selection of alignment of road. 3.4 Describe the reconnaissance survey for a road construction. 3.5 Describe the preliminary survey, final location survey and soil survey for a road construction. 3.6 Mention the points to be considered in fixing location of a new urban road.
02	4.1-5.3	01		4.1 Classify the highway geometric into broad categories such as: a) Cross-sectional elements (camber, super elevation) b) Visibility c) Horizontal / Vertical curves d) Road intersections 4.2 State the meaning of friction. 4.3 Mention the factors that affect friction of coefficient. 4.4 Define the terms skid and slip. 4.5 Describe the factors that affect the highway geometrics. 5.1 State the meaning of right of way. 5.2 Mention the factors on which the width of pavements depend. 5.3 State the terms in relation to road construction: formation width, side slope, berm, embankment, cutting, shoulder, carriage way width, footpath, cycle track, parking lanes, median strip, kerb.
	5.4-6.5	02		5.4 State the meaning of camber. 5.5 Explain the necessity of camber. 5.6 Describe the procedure of providing camber in road. 6.1 State the reaction time and reaction distance. 6.2 State the braking time and braking distance. 6.3 Classify the various types of sight distances. 6.4 Describe each type of sight distances. 6.5 Solve problems on stopping sight distance and passing sight distance.
03	7.1-7.10	01		7.1 State the meaning of curve. 7.2 Classify the various type of curves used in highway. 7.3 Mention the reasons for extra widening of road on curve. 7.4 State the meaning of super elevation. 7.5 Describe the method of providing super elevation on site. 7.6 Solve the problems on super elevation. 7.7 State the meaning of gradient. 7.8 Classify the various types of gradient. 7.9 Mention the factors on which the gradient of a road depend. 7.10 Describe the methods of fixing grade line on site.

03		02	Q.T	(1.1-7.10)
04	8.1-9.5	01		<p>8.1 Define intersection of roads.</p> <p>8.2 Mention the purposes of intersection of roads.</p> <p>8.3 Classify the level intersection of roads.</p> <p>8.4 Mention the advantages and disadvantages of each type of intersections and grade separations.</p> <p>8.5 Define underpass and Overpass .</p> <p>9.1 Define the term sub-grade in highway.</p> <p>9.2 Describe the characteristics of different sub-grade soil.</p> <p>9.3 Mention the suitable sub-grade for various types of highway construction.</p> <p>9.4 Describe the procedure of improving sub-grade soil for road construction.</p> <p>9.5 Describe construction of road in water logged area.</p>
	10.1-11.3	02		<p>10.1 Mention the advantages and limitations of aggregates for highway construction.</p> <p>10.2 List the tests required for aggregates used for highway construction.</p> <p>10.3 Describe different types of bituminous materials for road construction.</p> <p>10.4 State the properties of bituminous materials.</p> <p>10.5 List the standard tests on bituminous materials.</p> <p>11.1 Describe the procedure of earth work in cutting , filling and compaction of soil..</p> <p>11.2 Describe the turving used in road embankment.</p> <p>11.3 List the field tests needed to find out the good quality of compaction of soil for road construction.</p>
05	11.4-12.4	01		<p>11.4 Classify the road on the basis of materials, volume of traffic, type of traffic, number of lanes, direction of movement of traffic, area they traverse, cost of roads and rigidity of roads.</p> <p>11.5 Mention the factors influencing the selection of types of base and surfacing of road.</p> <p>12.1 Classify the various types of low cost roads.</p> <p>12.2 Describe the construction procedure of earthen road.</p> <p>12.3 Describe the construction procedure of gravel road.</p> <p>12.4 Describe the construction procedure of soil stabilized road.</p>
		02	C.T	(8.1-12.4)
06	13.1-14.3	01		<p>13.1 Define water bound macadam road.</p> <p>13.2 Describe the preparation of sub-grade for construction of WBM road.</p> <p>13.3 Describe the spreading of coarse aggregate for construction of WBM road.</p> <p>13.4 Describe the spreading of fillers in the construction of WBM road.</p> <p>13.5 Describe the method of rolling the road in the construction of WBM road.</p> <p>13.6 Describe the finishing of the surface and shoulders in the construction of WBM road.</p> <p>13.7 Mention the advantages and disadvantages of WBM road.</p> <p>14.1 Define bituminous road.</p> <p>14.2 Classify the different types of bituminous road.</p> <p>14.3 List the materials used in the bituminous pavement.</p>
				<p>14.4 Describe the specification of the materials used for bituminous pavement.</p> <p>14.5 Describe the construction procedure of bituminous road.</p> <p>14.6 Define the seal coat, tack coat and prime coat.</p> <p>14.7 State the terms bituminous carpet, bituminous concrete, sheet asphalt</p>

06	14.4-15.6	02		<p>and mastic asphalt.</p> <p>14.8 Mention the advantages and disadvantages of bituminous road.</p> <p>15.1 Describe the construction procedure of cement concrete (CC), submergible Road in hoar areas and reinforced cement concrete (RCC) road.</p> <p>15.2 List and explain the joints for CC and RCC road with their specification and sketches.</p> <p>15.3 Describe joint fillers & sealers in CC road and RCC road.</p> <p>15.4 Mention the functions of reinforcement & dowel bars in CC and RCC road.</p> <p>15.5 Mention the advantages & disadvantages of CC and RCC road.</p> <p>15.6 Distinguish between flexible and rigid pavement.</p>
07	16.1-17.3	01		<p>16.1 Mention the special points to be considered for alignment of hill road.</p> <p>16.2 Define the terms: village path or track, bridle path, motor road, hill road, salient curves, re-entrant curve, hair pin bend, corner bend, trace cut.</p> <p>16.3 State the meaning of retaining wall and breast wall.</p> <p>16.4 Mention the causes of land slide.</p> <p>16.5 Mention the preventive measures of land slide.</p> <p>17.1 Mention the requirements of highway drainage.</p> <p>17.2 Mention the factors which control the design of highway drainage system.</p> <p>17.3 Mention the effects of improper drainage.</p>
		02	Q.T	(13.1-17.3)
08	18.1-19.2	01		<p>18.1 Classify the different types of traffic signs.</p> <p>18.2 Explain the importance of traffic signs.</p> <p>18.3 Mention the utility of traffic studies.</p> <p>18.4 Mention the utility of traffic regulations.</p> <p>18.5 Mention the utility of traffic signs.</p> <p>19.1 State the meaning of arboriculture.</p> <p>19.2 Explain the purpose of plantation on road sides.</p>
	19.3-20.4	02		<p>19.3 Describe the process of tree planting, patern of tree planting and protection of trees on road sides.</p> <p>19.4 Mention the advantages and disadvantages of trees on road sides.</p> <p>20.1 List the machineries used for cleaning the site, earth cutting, earth removing, consolidating and grading in highway construction.</p> <p>20.2 List the machineries used for crushing road metals.</p> <p>20.3 List the machineries used for construction of bituminous road.</p> <p>20.4 List the machineries used for construction of CC & RCC road.</p>
09	21.1-22.3	01		<p>21.1 Describe the sub-grade, base and wearing course failures.</p> <p>21.2 Mention the typical failures of flexible pavement.</p> <p>21.3 Mention the causes of failures of CC & RCC road.</p> <p>21.4 Mention the typical failures of CC & RCC road.</p> <p>22.1 Explain the significance of routine maintenance of highways.</p> <p>22.2 Classify the maintenance work of road.</p> <p>22.3 Describe the maintenance of</p> <ul style="list-style-type: none"> (a) Earthen road. (b) Water bound macadam road. (c) Bituminous road. (d) CC & RCC road.

09	22.4-23.6	02		<p>22.4 Mention the causes for corrugations and wavy surfaces.</p> <p>22.5 Mention the remedies for corrugations and wavy surfaces.</p> <p>23.1 Distinguish between bridge and culvert.</p> <p>23.2 Mention the ideal site for construction a bridge or culvert in roads & highways.</p> <p>23.3 Classify the different types of bridges and culverts.</p> <p>23.4 Mention the factors which effects the choice & type of bridge or culvert.</p> <p>23.5 Define the terms: flood discharge, waterway, scouring depth, free board in the construction of bridges & culverts.</p> <p>23.6 Explain the necessity of repair and maintenance of bridges & culverts.</p>
10	24.1-24.4	01		<p>24.1 Mention the information required for planning of an airport.</p> <p>24.2 Mention the points to be considered in selecting the site for an airport.</p> <p>24.3 Describe the terms: landing strip, approach zone, running lengths & hanger.</p> <p>24.4 Classify different types of airport.</p>
		02	C.T	(18.1-24.4)
11	25.1-25.3	01		<p>25.1 Explain the terms: runway, taxiway, aprons, runway orientation, pattern & grade.</p> <p>25.2 Distinguish between runway and taxiway.</p> <p>25.3 State the meaning of heliport.</p>
	25.4-26.1	02		<p>25.4 Mention the functions of terminal building.</p> <p>25.5 Distinguish between heliport and airport.</p> <p>26.1 Mention the functions of airport building.</p>
12	26.1-	01		<p>26.2 Mention the facilities to be provided in airport building.</p> <p>26.3 State the meaning of warehouse.</p> <p>26.4 State the importance of warehouse.</p>
		02	Q.T	25.1-26.4

PRACTICAL

WEEK	CLASS	JOB NO.	BRIEF DESCRIPTION
01	01	01	. Setting an alignment of a new road.
02	02	02	Prepare the model of a typical clover leaf pattern of grade separation.
03	03	03	Perform crushing strength test of coarse aggregate used in road construction.
04	04	04	Perform abrasion test of coarse aggregate used in road construction.
05	05	05	Perform water absorption, specific gravity and density test of coarse aggregate used in road construction.
06	06	06	Perform the California Bearing Ratio (CBR) test.
07	07	07	Perform the aggregate impact value test.
08	08	08	Perform the test of grading of coarse aggregate.
09	09	09	Perform the following test for bitumen. a. Loss of ignition b. Softening point c. Fire point. d. Flash point e. Marshal test
10	10	10	Prepare the models of different types of traffic signs.
11	11	11	Average Daily traffic (ADT) survey in a busy road intersection.
12	12	12	Visit of a Fly Over/Overpass/Underpass/intersection/grade separation.
		13	Visit of an International Airport.

REFERENCE BOOKS

1. Highway Engineering -by Gur Charan Singh

2. A text book on Highway Engineering and Airports
-by S B Sehgal & K L Bhanot

3. Highway Engineering -by S C Rangwala
4. Highway and Airport Engineering -by V B Priyani

