INSTITUTEOFAERONAUTICALENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

CIVIL ENGINEERING

TUTORIAL QUESTION BANK

Course Title	**TRANSPORTATION ENGINEERING**				
Course Code	ACE013				
Programme	B.Tech				
Semester	VI	CE			
Course Type	Core				
Regulation	**IARE - R16**				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	1	4	3	2
Chief Coordinator	Dr. Shruthi Kaviti, Associate Professor,				
Course Faculty	Dr. Shruthi Kaviti, Associate Professor, Mr. B Suresh, Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students to:	
I	Enrich knowledge on cross sections and geometric features of highways.
II	Understand the importance of sub-grade soil and pavement construction materials
III	Design highway pavements and intersection conforming to IRC code provisions.
IV	Identify the problems and remedial measures for construction of safe and durable pavements

COURSE OUTCOMES (COs):

CO 1	Understand the importance of highway development of India and classification of roads and road patterns.
CO 2	Design various geometric elements like curves, gradients, super elevation etc.
CO 3	Capable of performing various traffic surveys and study basics of traffic engineering and regulations.
CO 4	Analyze traffic signals intersections and road markings and their designs.
CO 5	Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.

COURSE LEARNING OUTCOMES (CLOs):

ACE013.01	Understand necessity for highway planning, different road development plans.
ACE013.02	Study Classification of roads, road network patterns, highway alignment,
ACE013.03	Capable of performing various traffic surveys
ACE013.04	Study factors affecting alignment, engineering surveys, drawing and reports, highway project.
ACE013.05	Understand Importance of geometric design,
ACE013.06	Analyze factors affecting highway geometric design. Design controls and criteria
ACE013.07	To study the Characteristics and properties of highway materials.
ACE013.08	Predict basic parameters of traffic, volume, speed and density, traffic volume studies,
ACE013.09	Analyze Parking studies, on street and off street parking, road accidents, causes and preventive measures, accident.
ACE013.10	Understand types of Intersections, conflicts at intersections, requirements of at-grade intersection.
ACE013.11	Understand types of at grade intersections, canalization ,traffic islands, types of grade separated intersections, rotary intersection,
ACE013.12	Study concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.
ACE013.13	Understand Highway material characterization; subgrade soil, stone aggregate, bitumen materials, construction of gravel roads.
ACE013.14	Explain construction of water bound macadam roads, construction of bituminous pavements: Surface dressing, bitumen bound macadam, bituminous concrete,
ACE013.15	Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter and seal pavement failures, maintenance
ACE013.16	Understand types of at grade intersections, canalization traffic islands, types of grade separated intersections, rotary intersection.
ACE013.17	Study concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.
ACE013.18	Understand Highway material characterization; sub- grade soil, stone aggregate.
ACE013.19	Explain construction of water bound macadam roads, construction of bituminous pavements.
ACE013.20	Study Surface dressing, bitumen bound macadam, bituminous concrete
ACE013.21	Study various types of bitumen materials, construction of gravel roads
ACE013.22	Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.
ACE013.23	Analyze seal pavement failures, maintenance of highways

	UNIT- I			
	HIGHWAY DEVELOPMENT AND PLANNING			
	Part - A (Short Answer Questions)			
S No	**QUESTIONS**	**Blooms Taxonomy Level**	**Course Outcomes**	**Course Learning Outcomes (CLOs)**
1	What is the Necessity for highway planning in our country?	Remember	CO 1	ACE013.01
2	Write about Jayakar Committee and its Recommendations?	Understand	CO 1	ACE013.01
3	What do you understand by obligatory points?	Remember	CO 1	ACE013.01
4	What is highway alignment?	Remember	CO 1	ACE013.02
5	What is meant reconnaissance?	Understand	CO 1	ACE013.02
6	Explain the classification of Roads as per Nagpur road plan?	Remember	CO 1	ACE013.02
7	What are the main objectives of preliminary survey?	Remember	CO 1	ACE013.03
8	What is meant by a key map in a highway project?	Remember	CO 1	ACE013.03
9	Write short notes on Highway project report?	Understand	CO 1	ACE013.03
10	Write about index map in a highway project?	Remember	CO 1	ACE013.03
11	What are the various features of express ways?	Remember	CO 1	ACE013.04
12	Write about the classification of urban roads?	Understand	CO 1	ACE013.04
13	Explain the significance of central road research institute?	Remember	CO 1	ACE013.04
14	What are the general methods for classification of roads?	Remember	CO 1	ACE013.04
15	What are the disadvantages of improper road alignment?	Remember	CO 1	ACE013.05
	Part - B (Long Answer Questions)			
1	Discuss the basic requirements of an ideal alignment	Understand	CO 1	ACE013.01
2	Explain the classification of roads?	Remember	CO 1	ACE013.01
3	Discuss the classification of roads as per Nagpur road plan	Remember	CO 1	ACE013.01
4	Explain the classification of road patterns with neat sketches	Remember	CO 1	ACE013.01
5	Explain the salient features of second twenty year road plan	Remember	CO 1	ACE013.02
6	Explain the stages of engineering surveys for highway location?	Remember	CO 1	ACE013.02
7	Discuss in detail about highway project report?	Understand	CO 1	ACE013.02
8	What are the factors controlling highway alignment?	Understand	CO 1	ACE013.03
9	Explain in detail regarding Map study in engineering surveys?	Understand	CO 1	ACE013.03
10	Discuss the necessity of realignment in a highway project?	Remember	CO 1	ACE013.03
11	Explain the salient features of first twenty year road plan	Remember	CO 1	ACE013.03
12	Explain the salient features of third twenty year road plan	Remember	CO 1	ACE013.04
13	What is meant by highway alignment? What are the factors controlling highway alignment?	Remember	CO 1	ACE013.04
14	Discuss in detail about different road development plans in India?	Remember	CO 1	ACE013.04
15	Discuss in detail about classification of roads based on different categories?	Remember	CO 1	ACE013.04
	Part - C (Problem Solving and Critical Thinking Questions)			
1	The area of a certain district in India is 18,400 sq.km and there are 16 towns as per 1981 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001?	Understand	CO 1	ACE013.01
2	Determine the length of different categories of roads in a state in India by the year 2001 using third road development concept, the following data given. Total area of the state = 80,000 sq.km Total number of towns as per 1981 census =86 Overall road density aimed at= 82 km per 100 sq.km area.	Understand	CO 1	ACE013.01
3	The area of a certain district in India is 13,400 sq.km and there are 12 towns as per 1981 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001?	Remember	CO 1	ACE013.02
4	Calculate the lengths of National and State highways required in a district with a total area of 7200 km^2, Developed, Semi-developed & Undeveloped areas being 30,45&25 percent of the respective district. The no of towns with population over 1.0, 0.5- 1.0, 0.2-0.5 and 0.1-0.2 lakhs are 3,7, 12&20 respectively in a	Understand	CO 1	ACE013.02

	district using second twenty year plan?					

5	The following data were collected for planning road development program under backward district.
	    i) Total area = 9600Km^2
	    ii) Agriculture and developed area = 3200 Km^2
	    iii) Existing length of melted road = 322 Km
	    iv) Existing railway track length = 105 Km
	    v) Existing length of un-melted road = 450 Km
	Calculate the additional length melted and un-melted for the road system based on Nagpur road plan for the following district<table><tr><td>Population</td><td>>5000</td><td>2001-5000</td><td>1001-2000</td><td>501-1000</td><td><500</td></tr><tr><td>No of villages and towns</td><td>8(T)</td><td>40(S)</td><td>130(P)</td><td>280(Q)</td><td>590(V)</td></tr></table>
			Remember	CO 1	ACE013.03

6	Calculate NH , SH, MDR, ODR, VR as per twenty years plan (or) boundary road plan..
	    a) Total area = 18400 Km^2
	    b) Developed or agricultural area = 8000 Km^2
	    c) Undeveloped area = 4800 Km^2<table><tr><td>Population range</td><td>No of Towns</td></tr><tr><td>< 500</td><td>200</td></tr><tr><td>500-1000</td><td>350</td></tr><tr><td>1000-2000</td><td>750</td></tr><tr><td>2000-5000</td><td>360</td></tr><tr><td>5000-10000</td><td>150</td></tr><tr><td>10000-20000</td><td>80</td></tr><tr><td>20000-50000</td><td>25</td></tr><tr><td>50000-100000</td><td>10</td></tr><tr><td>>100000</td><td>5</td></tr></table>
			Understand	CO 1	ACE013.03

7	The area of a certain district in India is 25,600 sq.km and there are 18 towns as per 1991 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001?		Remember	CO 1	ACE013.04
	UNIT-II					
	GEOMETRIC DESIGN					
	Part – A (Short Answer Questions)					
1	What is Camber and explain its uses in detail?		Understand	CO 2	ACE013.06
2	Write about kerbs and mention various types of kerbs?		Remember	CO 2	ACE013.06
3	What do you understand by right of way?		Remember	CO 2	ACE013.06
4	Explain head light sight distance and stopping sight distance?		Understand	CO 2	ACE013.06
5	What do you understand by lag distance in the analysis of stopping sight distance?		Remember	CO 2	ACE013.07
6	Explain the concept of braking distance along with the formulae?		Remember	CO 2	ACE013.07
7	What do you understand by design speed		Understand	CO 2	ACE013.07
8	What do you understand by overtaking zones? Explain in one-way and two way roads		Remember	CO 2	ACE013.07
9	What do you understand by mechanical widening?		Remember	CO 2	ACE013.08
10	Explain set back distance and mention various factors influencing set back distance?		Remember	CO 2	ACE013.08
11	What is gradient and mention types of gradients?		Remember	CO 2	ACE013.08
12	Explain the concept of total reaction time in stopping sight distance?		Understand	CO 2	ACE013.09

12	What is equilibrium super elevation and why do we need to provide it?	Understand	CO 2	ACE013.09
13	What is Camber and explain its uses in detail?	Understand	CO 2	ACE013.09
14	Write about kerbs and mention various types of kerbs?	Remember	CO 2	ACE013.09
15	What is meant by grade compensation in geometric design?	Remember	CO 2	ACE013.09
	Part - B (Long Answer Questions)			
1	What are the factors controlling geometric design?	Understand	CO 2	ACE013.06
2	Explain the concept of PIEV theory in detail?	Understand	CO 2	ACE013.06
3	Derive an expression for stopping sight distance with the help of neat sketches?	Understand	CO 2	ACE013.06
4	Derive an expression for overtaking sight distance with the help of neat sketches?	Understand	CO 2	ACE013.07
5	Derive the expression for super elevation and explain with the help of neat sketches?	Remember	CO 2	ACE013.07
6	Explain different types of gradients that can be provided on highway alignment?	Understand	CO 2	ACE013.08
7	What is skid resistance and what are the factors on which itdepends?	Understand	CO 2	ACE013.08
8	Write about Design of Transition curves in detail? Explain the concept of shift?	Understand	CO 2	ACE013.09
9	Explain the factors on which overtaking sight distance depends?	Understand	CO 2	ACE013.09
10	Define skid resistance? What are the factors affecting it?	Understand	CO 2	ACE013.09
	Part - C (Problem Solving and Critical Thinking Questions)			
1	Calculate the safe stopping sight distance for design speed of 50 kmph for two way traffic on a two lane road.	Understand	CO 2	ACE013.06
2	Calculate the safe stopping sight distance for design speed of 100 kmph for two way traffic on a single lane road?	Remember	CO 2	ACE013.07
3	The speeds of overtaking and overtaken vehicles are 80 and 60 kmph respectively. If the acceleration of the overtaking vehicle is 2.5Kmph per second, Calculate the safe Overtaking sight distance for two way traffic?	Remember	CO 2	ACE013.08
4	A vehicle moving at 35Kmph speed was stopped by applying the brake. The length of the skid mark was 12.2m, if average skid resistance of the pavement is known to be 0.7, Determine the brake efficiency of the test Vehicle.	Understand	CO 2	ACE013.09
5	In a braking test a vehicle traffic at a speed of 75Kmph was stopped by applying brakes fully and skid marks was 5.8m in length. Determine the average skid resistance of pavement surface.	Remember	CO 2	ACE013.09
6	A vehicle travelling at 20kmph was stopped within 1.8 seconds after the application of brakes. Determine the average skid resistance.	Understand	CO 2	ACE013.06
7	The speeds of overtaking and over taken vehicle are 70 and 40kmph, respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99m/sec^2. a) Calculate safe overtaking sight distance b) Mention the minimum length of overtaking zone and c) Draw a neat sketch of overtaking zone and show the position of the sign post.	Remember	CO 2	ACE013.06
8	The radius of horizontal circular curve is 100m. The design speed is 50kmph and the design coefficient of lateral friction is 0.15. a. Calculate the superelevation required if full lateral friction is assumed to develop b. Calculate the coefficient of friction needed if no superelevationis provided. c. Calculate the equilibrium superelevation if the pressure on inner and outer wheels should be equal.	Understand	CO 2	ACE013.06
9	A two lane road with design speed 80kmph has horizontal curve of radius 480m. Design the rate of superelevationfor mixed traffic. By how much should the outer edges of the pavement be raised with respect to the centre line , if the pavement is rotated with respect to the centre line.	Understand	CO 2	ACE013.06
10	Design the super elevation for a horizontal highway curve of radius 500m and speed 100kmph	Understand	CO 2	ACE013.07
11	The design speed of highway is 80kmph. There is horizontal curve of radius 200m on a certain locality. Calculate the super-elevation needed to maintain this speed.	Understand	CO 2	ACE013.07
12	Calculate the values of ruling minimum and absolute minimum radius of horizontal curve of a national highway in plane terrain. Assume ruling design speed and minimum design speed values as 100 and 80 kmph respectively	Understand	CO 2	ACE013.07
13	Calculate the extra widening required for a pavement of width 7m on a horizontal curve of radius 250m if the longest wheel base of vehicle expected on	Understand	CO 2	ACE013.07

	the road is 7.0 m. design speed is 70 kmph.			
14	Find the total width of two lane road on a horizontal curve for a new National highway to be aligned along a rolling terrain with a ruling minimum radius having ruling design speed of 80 kmph. Assume necessary data as per IRC	Understand	CO 2	ACE013.08
15	Calculate the length of the transition curve and shift using the following data; • Design speed= 65 kmph • Radius of circular curve= 220 m • Allowable rate of superelevation= 1 in 150 • Pavement rotated about the centre line of the pavment • Pavement width including extra widening= 7.5 m	Understand	CO 2	ACE013.08
16	A national highway passing through rolling terrain in heavy rain fall area has a horizontal curve of radius 500 m. Design the length of transition curve using the fallowing data. • Design speed of vehicle= 80 kmph • Allowable rate of superelevation= 1 in 150 • Pavement rotated about the inner edge of the pavment. • Pavement width excluding extra widening= 7 m.	Remember	CO 2	ACE013.08
17	There is a horizontal curve of radius 400 m and length 200 m on this highway. Compute the set-back distance required from the centre line on the inner side of the curve so as to provide for • Stopping sight distance of 90 m • Safe overtaking distance of 300 m • Distance between the centre line of the road and the inner lane is 1.9 m.	Understand	CO 2	ACE013.09
18	A state highway passing through a rolling terrain has a horizontal curve of radius equal to the ruling minimum radius for a ruling design speed of 80 kmph. 1. Design all geometric features of the curve. 2. Calculate the set-back distance required from the centre line on the inner side of the curve on 2-lane highway so as to provide ISD.	Remember	CO 2	ACE013.09
19	A vertical summit curve is formed at the intersection of two gradient, +3% and -5%. Design the length of summit curve to provide a SSD for a design speed of 80 kmph. Assume any other data as per IRC.	Understand	CO 2	ACE013.09
20	A vertical summit curve is to be designed when two grades, +1/50 and -1/80 meet on a highway. The SSD and OSD required are 180 and 640 m respectively. But due to the site conditions the length of the vertical curve has to be restricted to a maximum value of 500 m if possible. Calculate the length of the summit curve needed to fulfil the requirements of SSD , OSD or atleast ISD.	Remember	CO 2	ACE013.09
21	A valley is formed by a descending grade of 1 in 25 meeting an ascending grade of 1 in 30. design the length of valley curve to fulfill both comfort condition and head light distance requirements for a design speed of 80 kmph. Assume allowable rate of change of centrifugal acceleration is 0.6 m/sec^2	Understand	CO 2	ACE013.06
22	An ascending gradient of 1 in 100 meets a descending gradient of 1 in 120. a summit curve is to be designed for a speed of 80 kmph so as to have an OSD of 470 m.While aligning a hilly road with a ruling gradient of 6%, a horizontal curve of radius 60 m is encountered. Find the compensated gradient at the curve.	Remember	CO 2	ACE013.06

TRAFFIC ENGINEERING AND REGULATION
Part - A (Short Answer Questions)

1	What is meant by Traffic Density in traffic engineering?	Understand	CO 3	ACE013.10
2	How the traffic volume data is collected and presented in traffic engineering?	Understand	CO 3	ACE013.10
3	Write in detail about the need for spot speed studies?	Remember	CO 3	ACE013.10
4	Define traffic volume, traffic speed and density.	Understand	CO 3	ACE013.11
5	What is the use of origin and destination studies.	Remember	CO 3	ACE013.11
6	Differentiate between time mean speed and space mean speed .	Remember	CO 3	ACE013.11
7	What is the need for road markings?	Remember	CO 3	ACE013.13
8	Show various types of traffic signs with neat sketches.	Understand	CO 3	ACE013.13
9	Define On street and off street parking?	Remember	CO 3	ACE013.13

10	Describe various causes for road accidents?	Remember	CO 3	ACE013.14
11	What are the different types of traffic signal systems?	Understand	CO 3	ACE013.14
12	What is origin and destination data and why do we do these studies?	Understand	CO 3	ACE013.14
13	List out various measures that may be taken to prevent accidents?	Remember	CO 3	ACE013.15
14	What is meant by collision diagram in accident studies?	Understand	CO 3	ACE013.15
15	What is meant by condition diagram in accident studies?	Remember	CO 3	ACE013.15
	Part – B (Long Answer Questions)			
1	Explain the procedure for conducting spot speed studies.	Remember	CO 3	ACE013.10
2	Explain the objectives of traffic volume study and traffic volume count methods.	Remember	CO 3	ACE013.11
3	Describe the process to analyze the Spot speed data?	Understand	CO 3	ACE013.12
4	What are the different types of studies which are carried out before laying pavements?	Remember	CO 3	ACE013.12
5	Write briefly about origin and destination studies?	Understand	CO 3	ACE013.12
6	Describe in detail about parking studies?	Remember	CO 3	ACE013.13
7	Distinguish between On street and Off street parking?.	Remember	CO 3	ACE013.14
8	What is Road Marking? What is the need for road markings and What are the types of road markings?	Remember	CO 3	ACE013.15
9	Describe various types of traffic signs used in traffic control and regulation giving at least two examples for each type. Support your answer with suitable sketches and specifications for the signs	Understand	CO 3	ACE013.13
10	Write about traffic volume studies and explain how the data is collected and presented in traffic engineering?	Remember	CO 3	ACE013.14
11	Show various types of traffic signs with neat sketches. Explain each in detail	Understand	CO 3	ACE013.15
12	Explain the design procedure of Traffic signals according to Webster method?	Remember	CO 3	ACE013.13
13	What are the engineering measures to reduce accident rates?	Understand	CO 3	ACE013.14
14	What are the enforcement measures to reduce accident rates?	Remember	CO 3	ACE013.15
15	Explain various types of traffic signal systems	Remember	CO 3	ACE013.13
	Part - C (Problem Solving and Critical Thinking Questions)			
1.	A vehicle moving at 40kmph speed was stopped by applying breaks and length of the skid mark was 12.2 m. if average skid resistance of the pavement is known to be 0.70. Determine the break efficiency of the test vehicle.	Understand	CO 3	ACE013.15
2.	In a breaking test a vehicle traffic at a speed of 30kmph was stopped by applying breaks fully and skid marks was 5.8m in length. Determine the average skid resistance.	Remember	CO 3	ACE013.13
3	A vehicle moving at 30kmph speed was stopped by applying break within 1.8 sec. determine the averages kid resistance	Understand	CO 3	ACE013.14
4	In a breaking test a vehicle traffic at a speed of 50kmph was stopped by applying breaks fully and skid marks was 6m in length. Determine the average skid resistance.	Understand	CO 3	ACE013.15
5	A vehicle moving at 70kmph speed was stopped by applying breaks and length of the skid mark was 25 m. if average skid resistance of the pavement is known to be 0.70. Determine the break efficiency of the test vehicle.	Remember	CO 3	ACE013.13
6	The load is applied on a pavement with the break efficiency of 2.6m width. Determine the average skid resistance	Understand	CO 3	ACE013.14
	UNIT -IV			
	INTERSECTION DESIGN			
	Part – A (Short Answer Questions)			
1	What do you understand by the term "At Grade intersection"	Understand	CO 4	ACE013.16
2	What do you understand by the term "Grade separated intersection"	Understand	CO 4	ACE013.16
3	Explain about the various design factors of rotary in rotary intersection.	Understand	CO 4	ACE013.16
4	Mention various advantages of rotary intersection?	Understand	CO 4	ACE013.16
5	Explain the design requirements of at-grade intersections?	Remember	CO 4	ACE013.16
6	What is Channelization and why do we require it?	Remember	CO 4	ACE013.17
7	What are the Limitations of Rotary Intersection?	Understand	CO 4	ACE013.17
8	Explain the concept of traffic island in the design of intersections.	Understand	CO 4	ACE013.17

9	What is weaving length in the design of rotary intersection?	Remember	CO 4	ACE013.17
10	Mention the advantages of channelized intersections?	Remember	CO 4	ACE013.17
11	What are the various types of at grade Intersections	Understand	CO 4	ACE013.18
12	What are the various types of grade-seperated Intersections	Understand	CO 4	ACE013.18
13	Mention various limitations of rotary intersection?	Remember	CO 4	ACE013.18
14	What are the different types of traffic islands.	Remember	CO 4	ACE013.18
15	Explain the design requirements of grade-seperated intersections?	Remember	CO 4	ACE013.19
Part – B (Long Answer Questions)				
1	Explain the design factors considered in rotary design	Understand	CO 4	ACE013.16
2	List the advantages and disadvantages of rotary intersection?	Remember	CO 4	ACE013.16
3	Explain various safety measures to be taken to prevent accidents at Rotary	Remember	CO 4	ACE013.16
4	What are the requirements of at grade Intersection and explain them	Understand	CO 4	ACE013.16
5	What are the basic forms of Intersection and explain each with two types?	Understand	CO 4	ACE013.16
6	What are the various types of at grade Intersections and explain them with neat sketches?	Understand	CO 4	ACE013.17
7	What are various types of Grade separated Intersections and explain them with neat sketches?	Remember	CO 4	ACE013.17
8	What is Channelization and explain the importance with its advantages and disadvantages?	Remember	CO 4	ACE013.17
9	Explain in detail about the different types of traffic islands	Remember	CO 4	ACE013.17
10	Explain in detail about the conflict points in 4-way road.	Remember	CO 4	ACE013.18
11	What are the types and advantages of grade separated intersections.	Understand	CO 4	ACE013.18
12	What are the types and advantages of at-grade intersections.	Remember	CO 4	ACE013.18
13	Explain in detail about the different types at-grade intersections	Remember	CO 4	ACE013.18
14	Explain in detail about the different types of grade-separated intersections	Remember	CO 4	ACE013.19
15	Explain in detail about the different types of traffic islands with sketches	Remember	CO 4	ACE013.19
UNIT–V				
HIGHWAY MATERIALS, CONSTRUCTION AND MAINTENANCE				
Part – A (Short Answer Questions)				
1	Explain the construction of water bound macadam?	Understand	CO 5	ACE013.21
2	Explain the construction of cement concrete roads?	Remember	CO 5	ACE013.21
3	Explain the construction of gravel roads?	Remember	CO 5	ACE013.21
4	Explain the construction of bituminous pavements?	Understand	CO 5	ACE013.21
5	How will construct the joints in cc pavements?	Understand	CO 5	ACE013.22
6	What is joint filler and seal?	Understand	CO 5	ACE013.22
7	What are the different factors for failure of pavements?	Remember	CO 5	ACE013.22
8	What do you mean by surface dressing and what is the role of surface dressing in the construction of highway?	Understand	CO 5	ACE013.22
9	Give the difference between water bound macadam roads and bitumen bound macadam.	Understand	CO 5	ACE013.22
10	How will do the maintenance of roads.	Understand	CO 5	ACE013.23
11	Explain about highway material characterization in road construction.	Understand	CO 5	ACE013.23
12	Explain in about construction of the joints in cc pavements?	Remember	CO 5	ACE013.23
13	What are the different surface defects in road construction	Understand	CO 5	ACE013.23
14	What are the different types of maintenance works in road construction	Understand	CO 5	ACE013.23
15	What are the various benefits of surface maintenance works in road construction.	Understand	CO 5	ACE013.23
Part – B (Long Answer Questions)				
1	What are the general causes of pavement failures	Understand	CO 5	ACE013.21
2	Explain the classification of road maintenance works?	Understand	CO 5	ACE013.21
3	Explain the typical failures of flexible pavements?	Remember	CO 5	ACE013.21
4	Explain the construction of water bound macadam?	Understand	CO 5	ACE013.21
5	Explain the construction of cement concrete roads?	Understand	CO 5	ACE013.22
6	Explain the construction of gravel roads?	Understand	CO 5	ACE013.22
7	Explain the construction of bituminous pavements?	Remember	CO 5	ACE013.22
8	How will construct the joints in cc pavements?	Understand	CO 5	ACE013.23
9	What is joint filler and seal?	Remember	CO 5	ACE013.23

10	What do you mean by surface dressing and what is the role of surface dressing in the construction of highway?	Understand	CO 5	ACE013.23
11	Give the difference between water and bitumen bound macadam roads?	Understand	CO 5	ACE013.23
12	Explain in detail about construction of the joints in cc pavements?	Understand	CO 5	ACE013.23
13	What are the different surface defects in road construction	Remember	CO 5	ACE013.23
14	What are the different types of maintenance works in road construction	Understand	CO 5	ACE013.23
15	Explain in detail about highway material characterization in road construction.	Remember	CO 5	ACE013.23

Prepared by:

Dr. Shruthi Kaviti, Associate Professor

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