

Enrollment No.....



Faculty of Engineering
End Sem Examination May-2024
CE3CO30 Transportation Engineering -II

Programme: B.Tech.

Branch/Specialisation: CE

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1 i. The camber required depends on _____. 1
 (a) Type of pavement
 (b) Rainfall
 (c) Type of pavement and rainfall
 (d) Rainfall characteristics
- ii. The ruling minimum radius in the curve is given by- 1
 (a) $R = V^2/127(e+f)$ (b) $R = V'^2/127 (e+f)$
 (c) $R = 127 (e+f)$ (d) $R = 127/ (e+f)$
- iii. The number of vehicles that pass through a transverse line of road at a given time in a specified direction is called _____. 1
 (a) Traffic studies (b) Traffic flow
 (c) Traffic origin (d) Traffic destination
- iv. Which of the following is not an objective of OD Studies? 1
 (a) To determine the amount of by passable traffic that enters a town and thus establishes the need for diversion
 (b) To develop trip generation and trip distribution models
 (c) To determine the potential of the present highway system and plan for new facilities
 (d) To assess the pedestrian pattern
- v. In the construction procedure for bituminous carpet, what treatment is provided if the existing surface is made of soft soil? 1
 (a) Tack coat (b) Prime coat
 (c) Seal coat (d) Stabilization

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- vi. Which are the two major parameters considered in the Marshall mix design? **1**
 (a) Workability and stability (b) Density and stability
 (c) Density and durability (d) Durability and stability
- vii. Which of the below joints is sawed after the placement of the cc slab? **1**
 (a) Expansion (b) Construction
 (c) Contraction (d) Isolation
- viii. Joints in the rigid pavement are placed in the _____. **1**
 (a) Surface course (b) Sub-base course
 (c) Base course (d) Subgrade
- ix. For how long is the needle allowed to penetrate in the penetration test? **1**
 (a) 5 seconds (b) 5 minutes
 (c) 10 seconds (d) 10 minutes
- x. Impact value is used to measure- **1**
 (a) Hardness (b) Toughness
 (c) Wheel load (d) Strength
- Q.2 i. Draw extra widening at the curve & write formulae for same. **2**
 ii. Explain different engineering surveys for highway location. **3**
 iii. Calculate the stopping sight distance on a highway at a descending gradient of 2% for the design speed of 80 KMPH. Assume total reaction time of driver is 2.5 sec, coefficient of friction as 0.35 & acceleration due to gravity as 9.8 m/sec². **5**
- OR iv. The speed of overtaking and overtaken vehicles are 70 & 40 KMPH respectively on a two way traffic road. If the acceleration of the overtaking vehicle is 0.99 m/sec²: **5**
 (a) Calculate safe overtaking sight distance
 (b) Mention the minimum length of overtaking zone
- Q.3 i. What do you understand about spot speed? **2**
 ii. Explain level of service in detail with a diagram. **3**
 iii. What do you understand from the O-D survey? Explain various types of surveys to be done in detail. (Any 4) **5**
- OR iv. What do you understand by traffic volume study? Explain various methods to carry out traffic volume survey in detail. (Any 2) **5**
- Q.4 i. What is a cutback? **2**
 ii. What are various factors affecting the design of flexible pavement? **3**

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- iii. Explain how 5 parameters to be determined by Marshall Stability Test of bituminous concrete mix with all the diagrams. **5**
- OR iv. Write procedure of CBR test. Also draw the California bearing ratio test graph of load and penetration of subgrade soil with the formulas. **5**
- Q.5 i. Write the function of tie bars in cement concrete pavement. **2**
 ii. What is ESWL? How will you determine the ESWL? **3**
 iii. Calculate the stresses at interior, edge & corner region of a cement concrete pavement using Westergaard's stress equations for following data: wheel load 5000 kg, modulus of elasticity 3*10⁵ kg/cm², pavement thickness 18 cm, Poisson's ratio of concrete 0.15, modulus of subgrade reaction 6.0 kg/cm², radius of contact area 15 cm. **5**
- OR iv. Explain warping stresses and frictional stresses with their formulas and naming the each parameters. **5**
- Q.6 i. Write names of various tests to be performed on road aggregates. **2**
 ii. Write a short note on fatigue and reliability of pavement. **3**
 iii. Name various types of failure in flexible pavement. Explain any 4 in detail. **5**
- OR iv. How pavement strengthening is done by the Benkelman Beam Method? **5**

Marking Scheme**CE3CO30(T)-Transportation Engineering -II**

Q.1	i)	c) Type of pavement and rainfall		1
	ii)	b) $R=V^2/127(e+f)$		1
	iii)	b) Traffic flow		1
	iv)	d) To assess the pedestrian pattern		1
	v)	b) Prime coat		1
	vi)	b) Density and stability		1
	vii)	c) Contraction		1
	viii)	a) Surface course		1
	ix)	a) 5 seconds		1
	x)	b) Toughness		1
Q.2	i.	Diagram	1 Mark	2
		Formula	1 Mark	
	ii.	3 engineering survey	1 Mark each	3
	iii.	Formula	1 Mark	
		Answer 132 m	4 Marks	
OR	iv.	Part a	2 Marks	5
		Part b	3 Marks	
Q.3	i.	Definition	2 Marks	2
	ii.	LOS explain	2 Marks	
		Diagram	1 Marks	5
	iii.	Explain O-D	1 Mark	
		4 Types of survey	4 Marks	
OR	iv.	Explain traffic volume	1 Mark	5
		4 Types of survey	4 Marks	
Q.4	i.	Explain cutback	2 Marks	2
	ii.	3 factors	3 Marks	
	iii.	5 Stability parameter	2.5 Marks	5
		diagram	2.5 Marks	
OR	iv.	Procedure	2 Marks	5
		Diagram	1 Marks	
		2 formula	2 Marks	
Q.5	i.	Tie bar function	2 Marks	2
	ii.	ESWL explain	1 Marks	
		Graphical or formula determination	2 Marks	3
	iii.	Correct formula	2 Marks	

OR	iv.	3 stress correct calculation	3 Marks	5
		warping stress with 3 formula 3 Marks frictional stress with formula 2 marks		
Q.6	i.	Any 4 names of test	2 Marks	2
	ii.	1.5 marks each		3
	iii.	6 types of failure names	1 Marks	5
OR	iv.	4 explain	4 Marks	5
		Procedure	3 Marks	
		Diagram	1 Marks	
		Formula	1 Marks	
