Reg. No.:					

Question Paper Code: 44103

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Fourth Semester

Civil Engineering

14UCE403 - HIGHWAY ENGINEERING

(Regulation 2014)

	Duration: Three hours			Maximum: 100 Marks	
		Answer A	ALL Questions		
		PART A - (1	$0 \times 1 = 10 \text{ Marks}$		
1. The road foundation for modern highways construction, was developed by					
	(a) tresguet		(b) telford		
	(c) macadam		(d) telford and macadar	n simultaneously	
2.	Border Roads Organis	ation for hilly reg	ions, was formed in		
	(a) 1947	(b) 1954	(c) 1958	(d) 1960	
3.	Width of vehicles affe	cts the width of			
	(a) lanes	(b) shoulders	(c) parking spaces	(d) all the above	
4.	4. The type of transition curves generally provided on hill roads, is				
	(a) circular		(b) cubic parabola		
	(c) Lemniscate		(d) spiral		
5.	Design of flexible pav	ements is based o	n		

(c) compromise of pure theory and pure empirical formula

(a) mathematical analysis(b) empirical formulae

(d) none of these

6.	The thickness of a pavement may be reduced considerably by						
	(a) compaction of soil(c) drainage of soil		(b) stabilisation of soil(d) all the above				
7.	In water bound macadam ro	oads, binding mat	erial, is				
	(a) sand	(b) stone dust	(c) cement	(d) bricl	k dust		
8.	Aggregate impact test is use	ed to evaluate					
	(a) percentage wear(c) Crushing strength		(b) Toughness(d) water absorpt	ion percenta	.ge		
9.	Reflection cracking is obser	rved in					
	(a) Flexible pavement(b) Rigid pavement(c) Rigid overlay flexib(d) Bituminous overlay	•	crete pavement				
10.	Intermediate catch water dra	ains are provided	only, if				
	(a) catchment area of th(b) intensity of rainfall(c) single catch water d(d) all the above	is heavy	-				
		PART - B (5 x 2	= 10 Marks)				
11.	State the classification of un	ban and non-urba	an roads as suggested by N	agpur plan.			
12.	Write PIEV theory.						
13.	List the components of flex	ible pavement.					
14.	What are the desirable prop	erties of Bitumen	?				
15.	Define skid resistance.						
	1	PART - C (5 x 16	5 = 80 Marks)				
16.	(a) Explain the various con	ventional engine	ering surveys for highway	alignment.	(16)		
		Or					

	(b)	(i)	Explain various types of surveys to be carried out before commencing the ne highway project.	(12)
		(ii)	State the objectives of highway research board.	(4)
17.	(a)	Exp	plain the points to be considered for planning of hair pin bends in hill roads.	(16)
			Or	
	(b)	Exp	plain the different types of gradients.	(16)
18.	(a)	Exp	plain the CBR method of pavement design. Discuss the limitations of this met	thod. (16)
			Or	
	(b)	(i)	Design the flexible pavement for the construction of a new highway with following data:	the
			 (1) Category of road: four lane dual carriageway (2) Number of commercial vehicles in the year: 5600 commercials completion of construction per day per direction (3) Annual growth rate of commercial vehicles: 8% (4) Design life: 15 years 	
		(···)	(5) Design CBR of sub-grade soil : 5%	(8)
		(11)	Compare rigid and flexible pavements.	(8)
19.	(a)	Exp	plain the various tests conducted on bitumen.	(16)
			Or	
	(b)	(i)	Explain the various sub surface drainage system with neat sketches.	(8)
		(ii)	Explain the construction procedure of cement concrete road as per specification.	IRC (8)
20.	(a)	Exp	plain the various surface defects in flexible pavements. Also mention their car	uses. (16)
			Or	
	(b)	Dis	scuss the various steps in highway project formulation.	(16)