Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3150613 Date:13/06/2022

Subject Name:Pavement Design and Highway construction

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**
5. **IRC codes are not allowed.**

Q.1	**(a)**	Explain the flexible pavement components and functions of its.	**03**
	(b)	Write short note on: Stone Matrix Asphalt	**04**
	(c)	Explain Marshall method for design of bituminous mix.	**07**
Q.2	**(a)**	Explain the terms: WBM and WMM	**03**
	(b)	Explain the desirable properties of road aggregates to be used in pavement construction.	**04**
	(c)	What are the various tests carried out on bitumen? Explain any one of them.	**07**
		OR	
	(c)	Enlist different methods of road construction. Discuss their advantages and disadvantages.	**07**
Q.3	**(a)**	Discuss desirable properties of Soil.	**03**
	(b)	Write short note on: (a) Emulsion (b) Cut back	**04**
	(c)	Explain ‘CBR’ Test in brief.	**07**
		OR	
Q.3	**(a)**	State advantages and disadvantages of earth roads.	**03**
	(b)	Differentiate between Flexible and rigid pavement with neat sketch.	**04**
	(c)	Explain different types of failures in flexible and rigid pavements.	**07**
Q.4	**(a)**	Discuss the factors affecting the design of pavements.	**03**
	(b)	Explain the following terms in flexible pavement construction: (a) Prime Coat (b) Tack coat (c) seal coat	**04**
	(c)	Explain the procedure of design of rigid pavements as per IRC-58 guidelines.	**07**
		OR	
Q.4	**(a)**	Explain ESWL.	**03**
	(b)	Discuss different software available for design of pavement.	**04**
	(c)	Explain the procedure of design of flexible pavements as per IRC-37 guidelines.	**07**
Q.5	**(a)**	Write short note on: Benkelman beam method	**03**
	(b)	Explain the following: (a) Maintenance of Pavement (b) Dry Lean Concrete	**04**
	(c)	What are the various types of joints in C.C. Pavements? Explain their functions with neat sketch.	**07**

OR

Q.5	**(a)**	Explain IRC recommendations for design of dowel bars.	**03**
	(b)	As C.C. Pavement has a thickness of 18 cm and has two lanes of 7.2 m with a longitudinal joint along the centre. Design the dimensions and spacing of the tie bar. Use of the following data: Allowable working stress in tension, Ss = 1400 kg/cm^2; Unit weight of concrete, W = 2400 kg/ m^3; Coefficient of friction = 1.5: Allowable bond stress in deformed bars = 24.6 kg/cm^2.	**04**
	(c)	Explain the terms: (a) Cold in place (b) Hot in place (c) Micro surfacing	**07**

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