Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3150613 Date:13-01-2023

Subject Name:Pavement Design and Highway construction

Time:10:30 AM TO 01:00 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. **Any codes/guidelines are not allowed.**

			MARKS
Q.1	**(a)**	Define: Bitumen, Emulsion, Tar.	**03**
	(b)	Explain the terms: ESWL, EWLF, VDF, modulus of resilient.	**04**
	(c)	Discuss the physical properties requirements for rural road and high-volume road.	**07**
Q.2	**(a)**	Write a note on: drainage consideration in pavement design.	**03**
	(b)	Write a note on: modified bitumen.	**04**
	(c)	Explain the Boussinesq's theory of stress analysis.	**07**
		OR	
	(c)	Explain the Burmister's two-layer and three-layer theory.	**07**
Q.3	**(a)**	Give the requirements of transverse joints and longitudinal joints in rigid pavements.	**03**
	(b)	Explain the fatigue concept used in IIT RIGID as per IRC-58.	**04**
	(c)	Explain the Friberg's analysis of dowel bar design.	**07**
		OR	
Q.3	**(a)**	Discuss the importance of lime stabilized subgrade.	**03**
	(b)	Discuss the criteria of pavement design for low volume road as per IRC SP-62.	**04**
	(c)	Discuss the subgrade rutting criteria and fatigue cracking criteria for bituminous layer.	**07**
Q.4	**(a)**	Explain the symptoms and causes of edge-breaking in pavements.	**03**
	(b)	Explain the use of dry lean concrete as subbase for rigid pavement.	**04**
	(c)	Explain with a neat sketch, the transition slab between rigid and flexible pavement.	**07**
		OR	
Q.4	**(a)**	Explain the symptoms and causes of shallow depressions in pavements.	**03**
	(b)	Write a note on: Interlocking Concrete Block Pavement (ICBP).	**04**
	(c)	Explain the method of construction of block pavement as per IRC SP 63.	**07**
Q.5	**(a)**	Explain different types of slurry sealing.	**03**
	(b)	Explain the types of defects in bituminous surfacing.	**04**
	(c)	Discuss the attributes and warrants for suitable preventive maintenance treatments as per IRC-82.	**07**
		OR	
Q.5	**(a)**	Write a note on: Hot in-plant recycling (HIP).	**03**
	(b)	Explain the important properties of bitumen emulsion.	**04**
	(c)	Explain the milling process of reclamation in pavement.	**07**

****