

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3150613****Date:03/02/2021****Subject Name:Pavement Design & Highway construction****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. IRC – 37 and IRC -58 codes are allowed.

	MARKS
Q.1 (a) What are the desirable properties of bituminous mix?	03
(b) Write short notes on (i) Mud pumping (ii) Structural cracks	04
(c) With the help of sketches, mention various layers of flexible pavement. Write function of each layer.	07
Q.2 (a) What are warping stresses? How are they developed in CC pavements?	03
(b) Enlist various tests carried out on bitumen emulsion. Explain any one in detail.	04
(c) Mention various steps involved in mechanistic pavement design of bituminous pavements as per IRC 37	07
Q.3 (a) What are requirements of expansion and contraction joints in rigid pavements?	03
(b) State assumptions and limitations of Boussinesq's theory	04
(c) List the different stresses induced in cement concrete pavements. Discuss the critical combination of these stresses.	07
Q.4 (a) Explain the selection and gradation of Binder course.	03
(b) What is an equivalent single axle load? How can it be determined?	04
(c) A 2.5 cm diameter dowel bar is transferring a vertical load of 3500N across a 0.5 cm wide joint. Compute the dowel bar deflection at the edge of the joint and the corresponding concrete bearing stresses. Can the concrete handle this stress? Given, K_c of 100,000 MPa/m, E_r of 200,000 MPa, and f_c' of 28 MPa.	07
Q.5 (a) Differentiate between WBM and WMM	03
(b) What do you mean by Ultra thin White topping? Explain in brief.	04

- (c)** Write the Construction procedure of embankment, subgrade and Sub base **07**

Q.6	(a) Write a short note on Interlocking Concrete Block Pavement (ICBP)	03
	(b) Write the steps in Design of overlay	04
	(c) Explain the construction procedure of Earthwork, Granular sub base, drainage layer and Dry lean concrete as per IRC-49	07
Q.7	(a) Differentiate between Cold in place (CIP) and Hot in place (HIP)	03
	(b) Explain types of defects in maintenance of pavement	04
	(c) Explain the Maintenance of pavement and its methodology as per IRC: SP:83	07
Q.8	(a) Enlist different bituminous mix treatments used in construction of pavements	03
	(b) Explain Cold mix technology as per IRC SP-100	04
	(c) Explain Stone matrix asphalt as per IRC SP-79 and Warm mix asphalt as per IRC SP 101	07
