

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024****Subject Code:3150613****Date:05-12-2024****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.

- Q.1** (a) What are the desirable properties of a bituminous mix? **03**
 (b) Define the terms: resilient modulus, elastic modulus, stiffness modulus, dynamic modulus **04**
 (c) Enlist various tests on aggregates and explain any two in detail. **07**
- Q.2** (a) Identify the difference between standard axle load and legal axle load. **03**
 (b) Explain the difference in analysis approach between the concrete and bituminous pavements. **04**
 (c) Explain various types of joints used in concrete Pavements. Point out the differences in their functions. **07**
- OR**
- (c) Explain the subgrade rutting criteria and fatigue cracking criteria for bituminous layer. **07**
- Q.3** (a) Draw the cross section of a typical bituminous pavement showing all its components. **03**
 (b) Briefly discuss the criteria for pavement design of low volume road as per IRC SP-62. **04**
 (c) Explain the boundary conditions and circular loading concept for Boussinesq's problem. **07**
- OR**
- Q.3** (a) Mention the advantages and disadvantages of full depth bituminous pavement. **03**
 (b) Explain the differences in design principles for design of dowel bar and tie bar systems. **04**
 (c) Explain the use of dry lean concrete in rigid pavement construction as per IRC-49. **07**
- Q.4** (a) How is the quantity of lime decided in soil-lime stabilization? **03**
 (b) Explain the concept and procedure of recycling of bituminous pavement. **04**
 (c) Describe the strength requirements as per guidelines of IRC SP 63. **07**
- OR**
- Q.4** (a) Distinguish between tack coat, seal coat and prime coat. **03**
 (b) Write a note on Interlocking Concrete Block Pavement (ICBP). **04**
 (c) Describe the symptoms, location and causes of raveling in bituminous layer. **07**
- Q.5** (a) Write the causes of pavement bleeding. **03**
 (b) Explain the moisture susceptibility in warm mix asphalt as per IRC SP 101. **04**
 (c) Explain the criteria for selection of preventive maintenance treatment of pavements. **07**
- OR**
- Q.5** (a) Discuss the benefits of white topping on existing bituminous pavements. **03**
 (b) Write a note on micro surfacing in pavements. **04**
 (c) Write a note on (i) Cold in place (CIP), (ii) Hot in place (HIP) **07**
