

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024

Subject Code:3150613

Date:23-05-2024

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. Any Codes/guidelines are not allowed.

MARKS

- Q.1** (a) List and explain the desirable properties of road aggregates. **03**
- (b) What are the factors influencing stresses on rigid pavement? List the assumptions. **04**
- (c) What are Emulsions? Explain in detail different types of emulsions. **07**
- Q.2** (a) Differentiate between legal axle load and standard axle load. **03**
- (b) Explain bituminous pavement with cemented base. **04**
- (c) Discuss Westergaard's concept of temperature stresses in concrete pavements. **07**
- OR**
- (c) Discuss Burmister's Two Layer Theory stating the assumptions. **07**
- Q.3** (a) Explain the function of longitudinal joints in CC pavements. **03**
- (b) Explain fatigue and rutting failures in bituminous layer. **04**
- (c) Explain the Fatigue concept as per the IIT RIGID software package. **07**
- OR**
- Q.3** (a) Write the primary purposes for the application of a prime coat on an aggregate base course. **03**
- (b) What are the various wheel load factors to be considered in pavement design? Explain each in detail. **04**
- (c) Describe step by step procedure for designing a Flexible Pavement with IRC method. **07**
- Q.4** (a) Write a note on: granular sealing. **03**
- (b) Explain construction methodology for drainage requirements in rigid pavement. **04**
- (c) Explain the selection and compaction criteria for Binder and wearing course in bituminous mix. **07**
- OR**
- Q.4** (a) Discuss the need of maintenance in flexible pavement. **03**
- (b) Describe the construction procedure of WMM road. **04**

(c) Explain the process of selection of different bituminous mix treatments as per specification of MORTH **07**

Q.5 (a) Write a note on: Warm Mix Asphalt. **03**

(b) Write a short note on micro surfacing. **04**

(c) List out the types of overlays and discuss their functions. **07**

OR

Q.5 (a) Write a note on: Recycle Aggregate Pavement (RAP) **03**

(b) Explain briefly the plant mix technology as per IRC. **04**

(c) Explain the salient features of ultra-thin white topping as per IRC SP-76. **07**
