

C.U. SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Highway Engineering

Subject Code: 4TE04HYE1

Branch: B.Tech (Civil)

Semester: 4

Date: 02/11/2018

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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- Q-1 Attempt the following questions (14)**
- a) What are the various modes of transportation? (1)
 - b) Enlist two important pavement surface characteristics. (1)
 - c) What do you mean by ESWL? (1)
 - d) What is surface drainage? (1)
 - e) Define safe passing sight distance. (1)
 - f) What is the total reaction time of driver. (1)
 - g) What is 'PPP'? (1)
 - h) PIEV stands for..... (1)
 - i) What is plate bearing test? (1)
 - j) What is the target density of road in Nagpur plan? (1)
 - k) Enlist the different test for bitumen. (1)
 - l) What is traffic control device? (1)
 - m) What is transportation? (1)
 - n) Which road authority works under Indian Road Congress? (1)

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- A) Calculate the deflection at the surface of a pavement due to a wheel load of 40 kN and a tyre pressure of 0.5 MN/m². The value of E of the pavement and subgrade may be assumed to be uniformly equal to 20 MN/m². (3)
 - B) The area of Maharashtra is 3,08,000 sq. km. The number of towns as per 1981 census is 276. The number of villages is 41,833. Calculate the length of various categories of roads. (4)
 - C) Explain the Boussinesq's theory and how it can be used for design of highway pavements. (7)
- Q-3 Attempt all questions (14)**
- A) Draw a cross-section of road pavement. (3)
 - B) Why are traffic signals needed? (4)



- C) Describe how a water-bound-macadam road is maintained. (7)
- Q-4 Attempt all questions (14)**
- A) Write a short note on BUSG. (7)
- B) Distinguish between Flexible Pavement and Rigid Pavement. (7)
- Q-5 Attempt all questions (14)**
- A) Discuss the importance of drainage in highway engineering. (7)
- B) Write a short note on: 1) Jaykar committee 2) Bombay road plan (7)
- Q-6 Attempt all questions (14)**
- A) Write a short note on “Joints” in Rigid pavement. (7)
- B) Describe the CBR test. (7)
- Q-7 Attempt all questions (14)**
- A) Enlist different tests for aggregates and describe abrasion test in brief. (7)
- B) Calculate the extra widening necessary on a two lane pavement for a radius of curve 100m. Assume the wheel base of design vehicle to be 6 m. Assume a design speed of 60 K.P.H. (3)
- C) What are the types of deficiencies observed in flexible pavement and their causes? (4)
- Q-8 Attempt all questions (14)**
- A) Design the reinforcement of a cement concrete slab 200 mm thick, assuming the following: (4)
1. Density of concrete: 2.3 gm/cc
 2. Coefficient of Friction: 1.5
 3. Transverse joint spacing: 15m
 4. Pavement width: 3.75m
 5. Working stress in steel: 1400kg/cm^2 (140MN/m^2)
- B) What is the purpose of soil stabilization? (3)
- C) A horizontal curve is to be designed for a National Highway in plain terrain. Calculate the ruling minimum and absolute minimum radii. Make suitable assumptions. (7)

