JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-6th Year (Civil)

COURSE CODE (CREDITS): 11B1WCE834 MAX. MARKS: 35

COURSE NAME: HIGHWAY CONSTRUCTION AND MAINTENANCE

COURSE INSTRUCTORS: Dr. Amardeep MAX. TIME: 2 Hours

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1. What do you mean by Prime Coat? What is the purpose of the prime coat in pavement construction? Discuss different application method also. (8)

Q2. What are the different pavement cross section elements? Please define their specification as per Indian Standards. (6)

Q3. Explain the procedure for analyzing the OSD on a two lane undivided highway. Explain each step with the help of net sketches. (9)

Q4. Soil subgrade sample was obtained from the project site and the CBR tests were conducted at field density. The following were the results: (4)

Penetration (mm)	Load (kg)	Penetration (mm)	Load (kg)
0.0	0.0	3.0	56.5
0.5	5.0	4.0	67.5
1.0	16.2	5.0	75.2
1.5	28.1	7.5	89.0
2.0	40.0	10.0	99.5
2.5	48.5	12.5	106.5

It is desired to use the following materials for different pavement layers.

a) Compacted sandy soil with 7% CBR
b) Poorly graded gravel with 20% CBR
c) Compacted sandy soil with 95% CBR
d) Minimum thickness of bituminous concrete surfacing may be taken as 5 cm.

The traffic survey revealed the present ADT of commercial vehicle as 1200. The annual rate of growth of traffic is found to be 8%. The pavement construction is to be completed in three years after the last traffic count.

a) Design the pavement section by CBR method as recommended by IRC, using all the four pavement materials.

b) Suggest alternate design without using poorly graded gravel.

Discuss the limitation of CBR method of pavement design in the light of above results.

Q5.A vehicle travelling at 40 kmph was stopped within 1.8 seconds after the application of the brakes. Determine the average skid resistance. (4)

Q6. A national highway passing through rolling terrain in heavy rain fall area has a horizontal curve of radius 500 m. Design the length of transition curve assuming suitable data. (4)