JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-Vth Semester (Civil)

COURSE CODE (CREDITS): 18B11CE511(3)   MAX. MARKS: 25

COURSE NAME: Highway Engineering

COURSE INSTRUCTORS: Dr. Amardeep   MAX. TIME: 1 Hour and 30 Minutes

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

Q1. The following data are related to a horizontal curved portion of a 7.5 m wide two-lane highway: having a length of curve of 200 m with a radius of 300 m. Calculate the set back distance to provide a SSD of 80 m.[CO2]   [5]

Q2. While aligning a road in a hilly area with a ruling gradient of 6.5%, a horizontal curve of radius 60m is encountered. Find the compensated gradient at the curve. [CO2]   [2]

Q3. A valley curve is formed by a descending gradient of 1/20 meets with an ascending gradient of 1/30. Design speed 85 km/h allowable rate of change of centrifugal acceleration is 0.61 m/s^3. Find the length of valley curve for comfort.[CO2]   [2]

Q4. Determine the length of the valley curve when a 3% rising gradient meets a 5% falling gradient. The design speed is given as 80 kmph. [CO2]   [3]

Q5. Sag curves have sight distance requirements because of nighttime sight distance constraints. The headlights on cars have a limited angle at which they can shine with bright enough intensity to see objects far off in the distance. If the government were to allow a wider angle of light to be cast out on standard car headlights, would this successfully provide more stopping sight distance? Give an explanation.[CO1]   [3]

Q6. A vertical summit curve is formed at intersection of two gradients, -4% & -6%. Design the length of summit curve to provide a SSD for a design speed of 60 kmph.
Assume other data. [CO2]   [3]

Q7. A NH passing through rolling terrain in heavy rainfall area has a horizontal curve of radius 500 m. Design the length of transition curve assuming suitable data. [CO2]   [3]

Q8. Tabulate the values for the different properties of aggregate required in the mix design for flexible pavement as per IRC. [CO3]   [2]

Q9. What do you mean by VG 40? Discuss all the required properties of the same as per specified by IRC. [CO 3]   [2]

$$D\ O = \frac{\frac{N}{40} sodium\ thiosulphate \times 2 \times 1000}{Sample\ thaken}\ mg/L$$

Dissolved Oxygen = mg/L

Results and Conclusions:

Precautions:

1. After the addition of reagents in water sample taken inside BOD bottle check is done and its removal is done if formed. Failing which the oxygen of air present inside the bubble will also take part in the reaction and this will lead to high value of DO.
2. The reagents should be added inside the bottle with the help of pipette to avoid more air contact.
3. Special care should be taken in sampling.
4. As far as possible, the sample should not be allowed to come in contact with air