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BTECH
(SEM VI) THEORY EXAMINATION 2021-22
TRANSPORTATION ENGINEERING

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If you require any missing data, then choose suitably.**SECTION A****1. Attempt all questions in brief.****2*10 = 20**

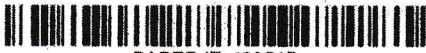
| Q.no | Questions | CO |
|------|---|----|
| (a) | What is the role of transportation in modern transportation system? | 1 |
| (b) | What is an arterial road? | 1 |
| (c) | What is bump integrator? | 2 |
| (d) | What do you mean by camber? | 2 |
| (e) | Define traffic capacity and jam density. | 3 |
| (f) | Define Level of service. | 3 |
| (g) | Explain radius of relative stiffness. | 4 |
| (h) | What are the factors responsible for warping stresses in CC pavement? | 4 |
| (i) | Explain the defect "fatty surface" in flexible pavement. | 5 |
| (j) | What do you mean by alligator cracking? | 5 |

SECTION B**2. Attempt any three of the following:****10*3 = 30**

| Q.no | Questions | CO |
|------|--|----|
| (a) | Explain the historical development of road construction. What are salient features of early roman roads? | 1 |
| (b) | A national highway passing through rolling terrain in heavy rainfall area has a horizontal curve of radius 500 m. Calculate the length of transition curve using the following data. • Allowable rate of superelevation= 1 in 150 • Pavement rotated about the inner edge of the pavement • Pavement width excluding extra widening= 7m • Design speed of vehicle= 80 kmph | 2 |
| (c) | What do you mean by grade separated intersection? Draw diagram of various interchange on the basis of shape. | 3 |
| (d) | Derive the equation of Green shield stream model and explain it with diagram. | 4 |
| (e) | Name any 5 test which are performed for aggregates. Explain any one test. Calculate aggregate impact value if weight of aggregate before and after the test is 500 gms and 400 gms respectively. | 5 |

SECTION C**3. Attempt any one part of the following:****10*1 = 10**

| Q.no | Questions | CO |
|------|--|----|
| (a) | Provide salient features of 1 st and 2 nd twenty year road development plan. | 1 |
| (b) | Write short notes on: a. Central road fund b. Jayakar Committee | 1 |



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4. Attempt any one part of the following: 10 * 1 = 10

| Q.no | Questions | CO |
|------|--|----|
| (a) | The speeds of the overtaking and overtaken vehicle are 70 and 40 kmph, respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2 a) Calculate safe overtaking sight distance b) Calculate the minimum and desirable length of overtaking zone c) Draw the neat-sketch of the overtaking zone and show the position of the sign post | 2 |
| (b) | An ascending gradient of 1 in 100 meets a descending gradient of 1 in 120. Design a summit curve for a speed of 80 kmph so as to have an OSD of 470 m. | 2 |

5. Attempt any one part of the following: 10 * 1 = 10

| Q.no | Questions | CO |
|------|---|----|
| (a) | Enlist and discuss briefly the various factors considered in the design of rotary intersection. Also write down the advantages and disadvantages of rotary. | 3 |
| (b) | What are traffic control devices? Explain Regulatory, warning and Guiding devices. | 3 |

6. Attempt any one part of the following: 10 * 1 = 10

| Q.no | Questions | CO |
|------|--|----|
| (a) | The average normal flow of traffic on cross roads A and B during design period are 400 and 250 PCU per hour the saturation flow values are 1250 & 1000 pcu/hr respectively. The all road time required for pedestrian crossing is 12 seconds. Design two phase traffic signal by Webster design. | 4 |
| (b) | Write the difference between flexible and rigid pavement. For a traffic stream speed density relationship was found to be $U = 79.46 - 0.59k$. Calculate the time headway corresponding to max flow. | 4 |

7. Attempt any one part of the following: 10 * 1 = 10

| Q.no | Questions | CO |
|------|---|----|
| (a) | What is the difference between WMM and WBM? Explain Semi dense bituminous concrete. | 5 |
| (b) | Explain the process of overlay design using Benkelman Beam Deflection Method. | 5 |