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**0200CET206122401**

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Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S4 (S, FE) / S2 (PT) (S, FE) / S4 (WP) (S) Examination December 2024 (2019 Scheme)

**Course Code: CET206**

**Course Name: TRANSPORTATION ENGINEERING**

Max. Marks: 100 Duration: 3 Hours

**PART A**

***(Answer all questions; each question carries 3 marks)*** Marks

| | | | |
|---|---|---|---|
| 1 | | What is camber? What are the factors affecting the amount of camber to be provided? | 3 |
| 2 | | Draw the cross section of a divided highway in urban area. | 3 |
| 3 | | What is aggregate impact value? What is its significance? | 3 |
| 4 | | What is the significance of softening point of bitumen in pavement construction? | 3 |
| 5 | | What are the objectives and uses of traffic volume study? | 3 |
| 6 | | What is meant by capacity of a transport facility? Which are the factors affecting the capacity? | 3 |
| 7 | | Explain coning of wheels. | 3 |
| 8 | | What are the forces created due to wave action against a marine structure? Explain with the help of a sketch. | 3 |
| 9 | | Draw the layout of a typical airport and mark the different components. | 3 |
| 10 | | What is an apron? What are the factors affecting dimensions of apron? | 3 |

**PART B**

***(Answer one full question from each module, each question carries 14 marks)***

**Module -1**

| | | | |
|---|---|---|---|
| 11 | a) | Explain classification of roads based on location as per Nagpur plan. | 5 |
| | b) | Determine the length of overtaking zone required for one way traffic condition with design speed of 100 kmph. Acceleration of overtaking vehicle is 0.92 m/sec$^2$ and speed of slow-moving vehicle is 80 kmph. Illustrate the details of overtaking zone with a neat sketch. | 9 |
| 12 | a) | Determine length of transition curve and the shift required for a two-lane highway in plain terrain at a horizontal curve of radius 300m. Design speed is 80kmph and width of road including extra widening is 7.5m. Assume that pavement is rotated about centre. Take rate of super elevation as 1 in 150. | 8 |

| | | | |
|---|---|---|---|
| | b) | Explain the design steps for introducing super elevation at a horizontal curve. | 6 |

**Module -2**

| | | | |
|---|---|---|---|
| 13 | a) | What is CBR value? Explain the procedure for CBR test for subgrade soil. | 7 |
| | b) | List the desirable properties of bitumen used for pavement construction. Explain the softening point test and ductility test for bitumen. | 7 |
| 14 | a) | Explain the construction steps for a bituminous concrete road. | 7 |
| | b) | Explain the CBR method of flexible pavement design. | 7 |

**Module -3**

| | | | |
|---|---|---|---|
| 15 | a) | Explain grade separated intersection. Illustrate any two types with neat sketches. | 6 |
| | b) | How speed and delay study is carried out? What are the applications of speed and delay study? | 8 |
| 16 | a) | Explain the design factors of rotary intersection. | 6 |
| | b) | Explain different types of traffic signs used in Indian roads. | 8 |

**Module -4**

| | | | |
|---|---|---|---|
| 17 | a) | If the ruling gradient is 1 in 150 on a BG and a curve of 4 degree is situated on its ruling gradient. What should be the allowable ruling gradient? | 5 |
| | b) | What is a dock? Differentiate between dry dock and wet dock. | 9 |
| 18 | a) | Explain the different stages of setting out of centreline for tunnel. | 7 |
| | b) | Explain the function of each component in a railway track with a neat figure. | 7 |

**Module -5**

| | | | |
|---|---|---|---|
| 19 | a) | What is wind rose diagram. Explain Type I wind rose diagram with figure. | 9 |
| | b) | What are the factors to be considered in the orientation and design of runway? | 5 |
| 20 | a) | Explain the factors affecting selection of site for an airport. | 5 |
| | b) | Calculate the actual length of runway from the data given below:<br>Airport elevation: R. L. 100 m<br>Airport reference temperature: 30°C<br>Basic runway length: 800m<br>Highest point along the runway: R. L. 98.4<br>Lowest point along the runway: R.L. 94.2 | 9 |

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