0200CET206122302

Reg No.:_

Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R,S) (FT/WP) / (S2 PT) Examination April 2025 (2019 Scheme

Course Code: CET206

Course Name: TRANSPORTATION ENGINEERING

Max. Marks: 100

Duration: 3 Hours

200

| | PART A | |
|----|---|-------|
| | (Answer all questions; each question carries 3 marks) | Marks |
| 1 | Define camber. Discuss the factors affecting camber on a road. | (3) |
| 2 | List out three objectives of providing transition curves. | (3) |
| 3 | List out three desirable properties of aggregates used in road construction and | (3) |
| | name the tests conducted to determine these properties. | |
| 4 | Define vehicle damage factor and lane distribution factor | (3) |
| 5 | Differentiate between space mean speed and time mean speed | (3) |
| 6 | State three the objectives of traffic volume studies. | (3) |
| 7 | List out the functions of rail used on a railway track. | (3) |
| 8 | Discuss the types of wet docks. | (3) |
| 9 | Draw the layout of an airport and label its parts. | (3) |
| 10 | What is wind rose diagram. Describe its use. | (3) |
| | PART B | |

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

Module -1

| 11 | a) | Explain the concept of overtaking sight distance on a two-way road and derive an | (5) |
|----|----|--|-----|
| | | expression for OSD. | |
| | b) | Calculate the length of transition curve using the following data: Design speed = 70 kmph Radius of circular curve = 200m Pavement width including extra widening = 7.5m Allowable rate of introduction of superelevation (pavement rotated about the centre line) = 1 in 150 | (9) |
| | | OR | |
| 12 | a) | Explain the factors affecting geometric design of highways. | (7) |

b) Calculate the minimum sight distance required to avoid a head on collision of (7) two cars approaching from opposite directions at 80 and 50 kmph. Assume a reaction time of 2.5 seconds, coefficient of friction of 0.5 and brake efficiency of 70% in both the cases

Module -2

- 13 a) Describe any four tests to check the suitability of bitumen used in road (8) construction.
 - b) Differentiate between flexible and rigid pavements

OR

14 a) Design a flexible pavement for the construction of a new highway with the (7) following data:

Category of road - four lane dual carriage way, number of commercial vehicles in the year of completion of construction = 2000 CVPD per direction, design life = 15 years, annual growth rate of vehicles = 4%, design CBR value of soil subgrade = 5%, vehicle damage factor = 2.5, lane distribution factor = 0.75



b) Explain the construction steps of a bituminous concrete road

Module -3

- 15 a) Explain the concept of level of service as per HCM. Discuss the factors affecting (10) level of service.
 - b) Describe four objectives of spot speed studies.

(4)

(7)

(6)

OR

16 a) A fixed time 2 phase signal is to be provided at an intersection having a N-S and (10) E-W road where only straight-ahead traffic is permitted. The hourly flows are given in the table. Calculate the optimum cycle time and green time for the minimum overall delay. The time lost per phase due to starting delays can be assumed to be 2 seconds. The value of the amber period is 2 seconds. Sketch the timing diagram for each phase.

| | N | S | E | W |
|----------------------|--------|------|------|------|
| Design hour flow (q) | 1000 | 800 | 450 | 500 |
| Saturation flow (s) | . 3000 | 2400 | 1800 | 2000 |

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| | b) | Describe floating car method of speed and delay study. | (4) |
|----|----|--|------|
| | | Module -4 | |
| 17 | a) | Explain the concept of gauges on railway track | (7) |
| | b) | Explain the features of mound breakwater | (7) |
| | | OR | |
| 18 | a) | Explain the functions and requirements of sleepers. | (7) |
| | b) | What is a dry dock? What is its function? Explain the types of dry docks | (7) |
| | | Module -5 | |
| 19 | a) | Explain the procedure of calculating basic runway length. | (7) |
| | b) | Discuss the types of runway patterns with neat sketches | (7) |
| | | OR | |
| 20 | a) | Calculate the actual length of runway from the following data: Airport elevation: RL 200 Airport reference temperature: 28 ^o C Basic runway length: 900m Effective gradient: 0.5% | (10) |
| | b) | Describe taxiway and terminal building in an airport | (4) |
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