Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R,S) / S4 (WP) (R) / S2 (PT) (S, FE) Examination May 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	Describe various classification of roads.	(3)
2	What is the mechanical widening required for a pavement of width 7 m on a horizontal curve of radius 500 m, if the longest wheel base of vehicles expected on the road is 6.5 m?	(3)
3	Describe the desirable properties of bituminous materials in the road construction.	(3)
4	Explain the factors to be considered for the design of pavements.	(3)
5	Describe the methods undertaken to obtain traffic speed data.	(3)
6	While considering traffic signs, under what circumstances give way and stop sign to be used?	(3)
7	Describe different types of gauges.	(3)
8	Differentiate between wet dock and dry dock.	(3)
9	Describe the significance of head wind during the take off and landing.	(3)
10	Explain the different runway patterns.	(3)

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

Module -1

11   a)   Derive an expression for Overtaking sight distance along with its factors.   (9)

      b)   Calculate the safe stopping sight distance for a design speed of 60 kmph for a two way traffic on two lane road and a two way traffic road on a single lane.   (5)

OR

12   a)   Explain the factors affecting the alignment of roads.   (9)

      b)   Design the rate of superelevation of a horizontal highway curve of radius 300 m and speed 70 kmph.   (5)

Module -2

13 a) Explain how you will identify the given set of aggregates are suitable for road construction. (9)

b) Describe the significance of California Bearing ratio test. (5)

OR

14 a) Explain the procedure involved in the design of flexible pavement as per IRC. (9)

b) Describe different types of bituminous construction. (5)

Module -3

15 a) A fixed time 2 phase signal is to be provided at an intersection having a North – South and a East – West road where only straight ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given below. (9)

	North	South	East	West
Design hour flow (q) in PCU/hour	600	300	700	1000
Saturation flow (s) in PCU/hour	2000	2000	3000	3000

Estimate the optimum cycle time and green times for the minimum overall delay assuming suitable value for amber period and the time lost per phase due to starting delays. Also Sketch the timing diagram for each phase.

b) Explain different types of capacity. (5)

Estimate the theoretical capacity of a traffic lane with one way traffic flow at a stream speed of 50 kmph. Assume t is the average reaction time = 0.7 seconds and assume average length of vehicle as 6m

OR

16 a) Illustrate different types of intersections with neat sketches. (9)

b) Describe the concept of level of service. (5)

Module -4

17 a) Explain different components of railway track with its functions. (9)

b) Describe the classification of break waters. (5)

OR

18 a) With sketches, describe how to transfer the centre line and grade of a proposed   (9)
        tunnel from a ground surface to tunnel interior.

    b) Explain different classification of harbours.   (5)

Module -5

19 a) With neat sketch, Explain the wind rose diagram with its significance in the airport   (9)
        planning.

    b) Explain the characteristics of a conventional type aircraft.   (5)

OR

20 a) Calculate the actual length of a runway from the following data   (9)
        Airport elevation: RL 100 m
        Airport reference temperature: 28°C
        Basic length of runway: 2100 m
        Highest point along the length of runway: RL 99.2 m
        Lowest point along the length of runway: RL 96.2 m

    b) Explain the factors governing the layout of taxiways.   (5)

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