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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
Fourth Semester B.Tech Degree Examination July 2021 (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	Draw the section of a two lane National Highway on embankment.	3
2	List out the necessity and requirements of transition curve at horizontal curves. How the length of transition curve is determined?	3
3	What is meant by aggregate crushing value? How is it estimated?	3
4	Distinguish between softening point and fire point of bitumen.	3
5	Define basic capacity of highway? How capacity of highway is estimated?	3
6	What do you mean by signal coordination? Explain systems of signal coordination	3
7	Explain coning of wheels.	3
8	Draw neat sketches of different shapes of tunnels and their suitability for railways.	3
9	Compare runway and taxiway.	3
10	What are the factors to be considered in the design of apron and hanger	3

**PART B**

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

**Module -1**

- 11 a) Why is extra widening provided at horizontal curves? Derive an expression for extra widening. 5
- b) Determine total width and length of transition curve required for a two lane highway in plain terrain at a horizontal curve of radius 320m. Design speed is 80kmph, length of wheel base = 6m and width of road = 7.5m. Assume that pavement is rotated about centre. Take rate of super elevation as 1 in 150. 9

**OR**

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- 12 a) What is the role of friction on geometric design of highways? What are the factors affecting skid resistance of a road surface? 6
- b) Calculate stopping sight distance required on a two lane road for a design speed of 65kmph at a gradient of 2%. Adopt reaction time of driver as 2.5sec and coefficient of friction as 0.35. 8

**Module -2**

- 13 a) What is the relevance of hardness test for road aggregates? Explain the procedure of hardness test. 5
- b) List out the tests conducted on bitumen. Explain ductility and penetration tests. 9

**OR**

- 14 a) Write down the procedure to design a flexible pavement by CBR method. 7
- b) Explain the construction steps of a bituminous concrete road 7

**Module -3**

- 15 a) Explain the influence of vehicular characteristics on traffic flow. 6
- b) With neat sketches describe different types of at-grade intersections 8

**OR**

- 16 a) Discuss the objectives and methods of spot speed study 8
- b) Calculate the optimum cycle time and green times for an isolated two phase traffic signal at an intersection formed two roads A and B. The normal and saturation flows on road A are 800PCU/hr and 2400PCU/hr respectively. Road B carries a normal flow of 750PCU/hr and saturation flow is 3000PCU/hr. Adopt the amber time as 2seconds and all red time is 12 sec. 6

**Module -4**

- 17 a) Draw a sketch of section of a railway track and mark the components. 8  
List out the functions and requirements of different components of railway track
- b) Differentiate between wet docks and dry dock. Briefly discuss types of dry docks. 6

**OR**

- 18 a) Describe the classification of break waters and advantages of each type. 8
- b) Write a brief note on tunnel survey. How transfer of centre line is done in tunnel survey?. 6

**Module -5**

- 19 a) What is meant by runway orientation? Explain any one method for orientation of runway. 10
- b) What are the factors to be considered in the selection of site for an airport? 4

**OR**

- 20 a) Define basic runway length. Discuss various cases considered for the estimation of basic runway length. 7
- b) Runway length required at ideal conditions is 2500m. Calculate the runway length required for a runway located at an elevation of 250m above mean sea level. The airport reference temperature is 18°C and the runway is laid at an effective gradient of 0.2%. 7

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