

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (S,FE) (FT/WP/S2PT) Examinations May 2026 (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 Define camber in highways. Discuss the factors that determine the amount of camber to be provided on a road. (3)
- 2 List the factors governing the width of the carriageway. State the IRC specifications for width of carriage way for different classes of roads. (3)
- 3 Distinguish between the load transfer mechanisms in flexible and rigid pavements. (3)
- 4 What are the functions of a prime coat in flexible pavement construction? (3)
- 5 Explain the difference between space mean speed and time mean speed used in traffic studies. (3)
- 6 Identify and explain the key factors that affect road capacity and level of service. (3)
- 7 Discuss any three engineering reasons that justify the need for transition curves in railway alignment. (3)
- 8 What do you mean by docks? How do dry docks differ from wet docks? (3)
- 9 Describe the purposes served by aprons and hangars in an airport. (3)
- 10 Discuss how headwind influences aircraft performance during take-off and landing. (3)

PART B

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

Module -1

- 11 a) Describe stopping sight distance (SSD). Enumerate the factors affecting SSD and derive the mathematical expression for SSD on a level surface. (7)
- b) Calculate the extra widening required for a pavement of 7.5 m width on a horizontal curve of radius 200 m if the longest wheel base of the vehicle expected on the road is 6.5 m. The design speed is 80 kmph. Compare the value obtained with IRC recommendations. (7)

- 12 a) Identify and explain the key factors that govern the geometric design of a highway. (7)
- b) The speeds of the overtaking and overtaken vehicles are 90 kmph and 60 kmph respectively on a two-way traffic road. The acceleration of the overtaking vehicle may be taken as 1.2 m/s^2 . (7)
- (a) Calculate the safe overtaking sight distance (OSD).
- (b) Determine the minimum and desirable lengths of the overtaking zone.

Module -2

- 13 a) What are the desirable properties of pavement aggregates? Describe any two tests used to assess their suitability. (7)
- b) Describe the material specifications and construction procedure of a granular sub-base (GSB) course. (7)
- 14 a) Explain any two important properties of bitumen that influence the performance of bituminous mixes in pavements. Describe the laboratory tests conducted to assess these properties. (7)
- b) Outline the procedure for CBR-based flexible pavement design. (7)

Module -3

- 15 a) Explain the different types of traffic signs used on highways and support your answer with labelled sketches. (7)
- b) In what ways do visual characteristics of road user influence traffic flow? (7)
- 16 a) Discuss the classification of at-grade intersections and illustrate any two types with neat sketches. (7)
- b) What is meant by signal coordination? Describe any three systems of signal coordination in detail. (7)

Module -4

- 17 a) Illustrate the cross-section of a permanent way on an embankment and discuss the function of each component of a railway track. (7)
- b) Explain the purpose of breakwaters. Describe the construction procedure for mound-type breakwaters. (7)
- 18 a) Draw a neat layout of an artificial harbour and label its main components. Also explain the important planning considerations of a harbour basin. (7)
- b) Discuss the step-by-step procedure for establishing and transferring the tunnel centreline. (7)

Module -5

- 19 a) Explain the concept of a wind rose diagram. Illustrate and discuss the features of a Type I wind rose. (7)
- b) The length of runway under standard conditions is 1620 m. The airport site has an elevation of 270 m. Its reference temperature is 32.94°C . Determine the corrected runway length. Also check whether the combined correction exceeds ICAO recommendations. (7)
- 20 a) Discuss any seven major criteria that influence the choice of an airport site. (7)
- b) Describe the various runway layout patterns and illustrate them with neat diagrams. (7)