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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Supplementary Examination June 2023 (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 are the objectives of preliminary survey for highway alignment? (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 Compare the load transfer characteristics of flexible and rigid pavements. (3)
- 4 List out the desirable properties of aggregates to be used in pavement construction. Also specify various tests for judging the suitability of aggregates. (3)
- 5 What are the objectives of OD surveys? List the methods for collecting OD data. (3)
- 6 With the help of neat sketches, differentiate between diamond interchange and trumpet interchanges. (3)
- 7 Differentiate between dry dock and wet dock. (3)
- 8 The ruling gradient is 1 in 200 on a particular section of a BG track. If a curve of 4 degree is situated on this ruling gradient, what should be the actual ruling gradient to be provided on this curved portion of the track? (3)
- 9 Distinguish between apron and hangar. (3)
- 10 Explain any three situations in which the change in direction of runway as determined from wind rose diagram is necessary? (3)

PART B

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

Module -1

- 11 a) Explain the different types of gradients. What is meant by grade compensation? (7)
- b) Find out the length of the transition curve passing through a plain terrain for a two lane pavement with an extra widening on horizontal curve of radius 200m. The design speed = 60 kmph. Width of pavement including extra widening = 7.5 m (7)

superelevation provided = 0.07. Assume that the pavement is rotated about the centre line at a rate of 1 in 100.

- 12 a) Enumerate the steps for practical design of superelevation of a highway under mixed traffic conditions. (7)
- b) Determine the length of overtaking zone required for one way traffic condition with design speed of 100 kmph. Acceleration of overtaking vehicle is 0.9m/sec^2 and speed of slow moving vehicle is 60 kmph. Illustrate the details of overtaking zone with a neat sketch. (7)

Module -2

- 13 a) Explain the procedure for obtaining the CBR value of a soil sample. (7)
- b) Describe the construction practices of bituminous penetration macadam base course. (7)
- 14 a) Discuss any two desirable properties of bitumen and their effect on performance of bituminous mixes in pavements. Explain the laboratory tests to be conducted to assess these properties. (7)
- b) Outline the IRC 37-2012 recommendations for determining the thickness of flexible pavements. (7)

Module -3

- 15 a) Explain the design elements of a rotary intersection. (7)
- b) List out the various factors which affect the road user characteristics in traffic engineering. What are the effects of road user characteristics in traffic performance? (7)
- 16 a) What are the different types of traffic signs? Explain them with the help of sketches. (7)
- b) Explain the significance of passenger car unit in traffic volume study. What are the factors affecting PCU values. (7)

Module -4

- 17 a) i) List the component parts of a railway track and explain their function. (7)
- ii) Find out the length of curve for a BG curved track having 5 degree curvature and a cant of 12 cm. The maximum permissible speed on the curve is 90kmph.
- b) Explain the planning aspects of a harbour basin. (7)
- 18 a) List and explain the different stages of setting out of centreline of tunnels. (7)
- b) Describe the construction methods of mound type break waters. (7)

Module -5

- 19 a) List the factors affecting the selection of site for airport. Explain any five in detail. (7)
- b) The length of runway under standard conditions is 1620m. The airport site has an elevation of 270m. Its reference temperature is 32.94 °C. If the runway is to be constructed with an effective gradient of 0.20percent, determine the corrected runway length. (7)
- 20 a) What is wind rose diagram? Explain the use and types of this. (7)
- b) List the geometric standards of taxiway design. Explain any six in detail. (7)
