Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), JULY 2022

CIVIL ENGINEERING
(2020 SCHEME)

Course Code : **20CET206**

Course Name: **Transportation Engineering**

Max. Marks : **100** **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Draw the typical cross section of a Major District Road (MDR) in Embankment indicating the width of pavement, road way and land.
2. Summarize PIEV Theory and its importance.
3. Explain how Penetration value of bitumen is arrived at?
4. Differentiate between flexible and rigid pavements.
5. Define basic capacity, possible capacity and practical capacity.
6. Explain the term Traffic volume. What are the objects of carrying out traffic volume studies?
7. What is meant by coning of wheels? Why is tilting of rails adopted?
8. Differentiate between dry dock and wet dock.
9. Illustrate any four factors, which would be kept in view while selecting suitable site for an airport.
10. Enumerate the factors controlling taxiway layout.

PART B

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

MODULE I

11. a) Drive the expression for extra widening on horizontal curves. (7)
    b) Speeds of overtaking and overtaken vehicles are 80 kmph and 50 kmph respectively on a two-way traffic road. The average acceleration during overtaking may be assumed as, $a=0.99 m/s^2$. Reaction time of the driver is 2.5s. Calculate the safe overtaking sight distance and mini length of overtaking zone. Draw a sketch of the zone and mark the positions of sign posts. (7)

OR

12. a) List out the necessity and requirements of a horizontal transition curve. (7)
    b) In a road with horizontal curve with radius is 190 m, design speed is 80kmph. Design the superelevation and allowable speed. (7)

MODULE II

13. a) Define CBR. Enumerate the test procedure in the laboratory. How are the results of the test obtained and interpreted? (10)
    b) Explain the desirable properties of aggregates used for pavement construction. (4)

OR

14. a) Outline any four Factors controlling flexible pavement design. (7)
    b) Describe the IRC method of flexible pavement design. (7)

MODULE III

15. a) With neat sketches show five different regulatory traffic signs and mention the function of each. (7)
    b) List the objects of speed study?
    Explain in detail one method of spot speed study. (7)

OR

16. The average normal flow for the traffic on cross roads 1 and 2 during design period are 440 and 280 PCU per hour; the saturation flow values on these roads are estimated as 1300 and 1100 PCU per hour respectively. The all red-time required for pedestrian crossing is 12 s. Design two phase traffic signal with pedestrian crossing by Webster's method. Draw the phase diagram. (14)

MODULE IV

17. a) Describe the functions and requirements of Ballast. (7)
    b) Explain cant deficiency and the procedure for finding the speed in main line and branch line. (7)

OR

18. a) Enumerate the procedure for transferring the centre grade to tunnel. (7)
    b) Explain the necessity and functions of breakwaters. (7)

MODULE V

19. What is wind rose diagram? Explain it's utility. What are its types? Discuss any one type with neat sketches. (14)

OR

20. a) Define Basic runway length. (4)
    b) The length of runway under standard condition is 2500m. The airport site has an elevation of 270m. The reference temperature is 32.9 ^{0}C. The runway is to be constructed with an effective gradient of 0.2 percent. Determine the corrected runway length. (10)

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