D **512B3** **Total pages: 2**

Register No: …… Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH. DEGREE EXAMINATION(R,S), MAY 2024

Civil Engineering

(2020 SCHEME)

Course Code : 20CET206

Course Name : Transportation Engineering

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

Use of IRC 37 - 2018 and CBR design charts are permitted in the examination hall.

PART A

(Answer all questions. Each question carries 3 marks)

1. How are roads classified as per Nagpur Road Plan?
2. Enumerate the various factors affecting stopping distance of a vehicle.
3. Identify and explain three desirable properties of coarse aggregates used in highway construction.
4. Enumerate the requirements of bituminous materials used in pavement construction.
5. Enumerate the different methods of traffic volume count.
6. Enlist the various road user characteristics that decide the traffic performance.
7. Discuss the importance of ballast in a railway track and its primary function.
8. Identify a tunnel cross section suitable for constructing a sewerage. Justify your selection.
9. How do VFR differ from IFR in flight operations?
10. State the need for holding aprons (warm up pads) at an airport. Where are they located at an airport?

PART B

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

MODULE I

11. a) Describe the factors governing the magnitude of cross slope of pavement surfaces. Explain the types of camber stating the suitability of each. 8
    b) Explain the various kinds of kerbs used in highways. 6

OR

12. Calculate the length of transition curve and shift using the following data: 14
    Design speed = 80 kmph, radius of circular curve = 230 m, allowable rate of introduction of superelevation (pavement roatated about inner edge) = 1 in 150 and pavement width including extra widening = 7.5 m.

MODULE II

13. a) Define ESWL. Explain the graphical method to determine the ESWL of a dual wheel assembly. 7
    b) Explain the effect of load repetitions and climatic variations on flexible pavement design. 7

OR

14.	a) Explain the objectives of interface treatments in bituminous pavement construction.	5
	b) Explain the CBR method of pavement design. What are the limitations of CBR method?	9

MODULE III

15.	The average normal flow of traffic on roads A and B during design period are 400 and 250 pcu per hour, the saturation flow values on these roads are estimated as 1250 and 1000 pcu per hour respectively and the all red time required for pedestrian crossing is 12 seconds. Design a two phase traffic signal by Webster's method. Also draw the timing diagram.	14

OR

16.	a) Sketch the various forms of at grade intersections.	7
	b) Explain the traffic operations at a rotary intersection mentioning the advantages and disadvantages.	7

MODULE IV

17.	a) Describe the classification of harbours based on formation and their function.	7
	b) Prepare the sketch of a typical artificial harbour indicating the various components. Mention the function of each component.	7

OR

18.	a) Enumerate the functions of dry docks. Explain the operation of a dry dock with a neat sketch.	7
	b) State the circumstances under which wet docks are required at a port. How are they operated?	7

MODULE V

19.	a) Illustrate the typical runway configurations at an airport.	4
	b) Explain the procedure of orienting the runways using a wind rose diagram.	10

OR

20.	a) Describe the aircraft operating cases considered for deriving the basic runway length.	4
	b) Runway at an airport is situated at an elevation of 250 m with an effective gradient of 0.25%. Airport Reference Temperature is 18º C. The basic runway length is 2500 m. Determine the actual length of runway required at the site.	10

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