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

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2023

(2020 SCHEME)

Course Code : 20CET294

Course Name: Pavement Construction and Management

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

PART A

(Answer all questions. Each question carries 3 marks)

1. Differentiate emulsion and cutback.
2. The pavement construction industries in Kerala prefer to use modified binders for the construction of National Highways. What would be the possible reason?
3. Explain the terms VMA and VFB.
4. Highlight any two advantages of SUPERPAVE mix design method.
5. Highlight the major differences between Water Bound Macadam and Wet Mix Macadam.
6. Why do you think that the field engineers prefer to adopt Dense Bituminous Macadam (DBM) over Bituminous Macadam (BM).
7. Differentiate tie bar and dowel bar.
8. Differentiate plain cement concrete pavement and reinforced cement concrete pavement.
9. List out any two objectives of pavement management system.
10. What is the need for pavement deterioration models?

PART B

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

MODULE I

11. a) Explain any four methods to assess the quality of aggregates to be used in the construction of base layer of a flexible pavement. (8)
    b) Highlight the major differences between flexible and rigid pavements. (6)

OR

12. a) Illustrate the different layers of a flexible pavement with the help of a neat sketch. Explain the functions of each layer. (8)
    b) Explain any two methods to characterize the subgrade soil to be used in the construction of flexible pavement. (6)

MODULE II

13. a) Explain the major steps involved in the construction of bituminous surface course. (8)
    b) Differentiate penetration layer system and premixed aggregate system with the help of suitable examples. Also highlight the features of both these methods. (6)

OR

14. a) Illustrate Marshall method of mix design with the help of relevant graphical representations. (8)
    b) Explain any three bituminous mixes commonly preferred for the construction of pavements in India. (6)

MODULE III

15. a) Consider the case where you are expected to construct pavement over a subgrade with 2% CBR. Explain any two possible strategies that you would adopt to overcome the inherent weakness of the in-situ subgrade. (8)
    b) Explain any three quality control mechanisms that can be adopted during the construction of bituminous surface courses. (6)

OR

16. a) Explain any four construction equipment commonly adopted for the construction of flexible pavements. (8)
    b) Highlight the specifications recommended in MoRTH regarding the dense bituminous mixes to be used in the construction of flexible pavements. (6)

MODULE IV

17. a) Explain the various types of joints in rigid pavements with the help of a neat sketch. (8)
    b) Highlight any two methods that can be adopted to characterize the strength of subgrade in case of a rigid pavement. (6)

OR

18. a) Explain the various stages of construction of a cement concrete pavement. (8)
    b) How do you prepare the supporting layer for a cement concrete pavement? (6)

MODULE V

19. a) Highlight the major differences between network level and project level pavement management system. (8)
    b) Explain the steps involved in the life cycle cost analysis of a highway project with the help of a suitable example. (6)

OR

20. a) Describe any one method that can be adopted for the structural and functional evaluation of a pavement. (8)

b) Explain any two maintenance activities that can be adopted for a National Highway with thick bituminous surfacing. (6)

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