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

(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. List the desirable characteristics of a Pavement.
2. Compare penetration grading and viscosity grading of bitumen.
3. How do we calculate the optimum binder content by Marshall method?
4. Explain about super-pave mix design.
5. What is slurry seal and micro-surfacing?
6. List any 3 excavating machinery used in highway construction. Mention the uses of each.
7. Differentiate between dowel bar and tie bar.
8. Explain the functioning of expansion joint and dowel bar during expansion and contraction.
9. What are the benefits of Pavement Management System?
10. Differentiate between network level and project level pavement management system.

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

MODULE I

11. a) Differentiate between flexible and rigid pavements (6)
    b) What are the various tests for judging the suitability of aggregates in pavement construction? Discuss the objects of carrying out each of these tests (8)

OR

12. a) What are the different types of bituminous materials used in road construction? Under what circumstances each of these materials is preferred? (6)
    b) Discuss the component parts of flexible pavement with a neat sketch (8)

MODULE II

13. a) In a bituminous concrete mix, the theoretical specific gravity is 2.434, bulk specific gravity is 2.323, and the specific gravity of bitumen used is 1.05 (6)

with 4.5% by weight of bitumen in the mix. Determine VMA, VFB.

b) Discuss about dense graded bitumen mixes and semi-dense graded bitumen mixes. (8)

OR

14. a) What are the desirable properties of bituminous mixes? (6)

b) The specific gravities and weight proportions for aggregate and bitumen are as under for the preparation of Marshall mix design.

Item	A1	A2	A3	A4	B
Weight (gm)	825	1200	325	150	100
Specific gravity	2.63	2.51	2.46	2.43	1.05

(8)

The volume and weight of one Marshall specimen was found to be 475 cc and 1100 gm. Assuming absorption of bitumen in aggregate is zero, find V_V, V_b, VMA and VFB.

MODULE III

15. Mention the specification of materials, construction steps and quality control tests for laying bituminous concrete surface course (14)

OR

16. a) What are the common types of equipment used for compaction of soil? Mention the uses and limitations of each. (6)

b) Explain the construction procedure of base and sub-base courses in flexible pavement construction (8)

MODULE IV

17. a) With the help of a diagram, explain the various layers of a rigid pavement (6)

b) List the factors affecting the design and performance of rigid pavements. Mention the importance of each. (8)

OR

18. a) Design the spacing between expansion joints, if the expansion joint gap is 2.0 cm in a cement concrete pavement. The laying temperature is 10°C and the maximum slab temperature in summer is 50°C. (6)

b) What are different types of joints in CC pavements? Mention the functions of each. (8)

MODULE V

19. a) Distinguish between routine maintenance and special maintenance of pavements. (6)

b) Discuss about the principal components of pavement condition surveys. (8)

OR

20. a) Explain the methods for functional and structural evaluation of bituminous pavements. (6)

    b) What are the different types of data required in PMS? (8)

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