CBCS SCHEME

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18CV733

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2025
Pavement Materials and Construction

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Discuss in brief the importance of aggregates size and gradation while adopting in aggregates mixes used in road construction. **(10 Marks)**

b. What are the desirable properties of road aggregates? Explain briefly. Explain any two tests conducted to justify their properties, with IRC specifications. **(10 Marks)**

OR

2 a. Describe the properties and requirements of Bitumen as a road construction material. **(10 Marks)**

b. Explain the preparation of Tar with a neat flow chart. Explain the process in each step briefly. **(10 Marks)**

Module-2

3 a. What are the major characteristics of the emulsions? Explain briefly. **(10 Marks)**

b. Define Emulsifier. Explain the types of emulsifiers with neat sketch. **(10 Marks)**

OR

4 a. Define Cutbacks. Explain briefly the types of cutbacks. **(10 Marks)**

b. What are the major tests conducted on the road emulsions? Explain any two tests with neat sketches. **(10 Marks)**

Module-3

5 a. What are the Marshall properties of Bitumineous mixes? Explain the process of preparation of Marshall mould with specifications. **(10 Marks)**

b. Explain the principle of proportioning of aggregates using Rothfutch's method with a neat representation diagram. **(10 Marks)**

OR

6 a. What are the mechanical properties of Bituminous mixes? Explain briefly the types of Bituminous mixes. **(10 Marks)**

b. A Bituminous concrete mix for Marshall stability test gave the result :

Coarse aggregate	= 50%	- SG = 2.70
Fine aggregate	= 40%	- SG = 2.60
Mineral filter	= 04%	- SG = 3.10
Bitumen	= 06%	- SG = 1.00

*SG – specific gravity

The prepared specimen weighed 1233 gms in air and 710 gms in water. Determine :

i) Maximum theoretical density
ii) Total air voids
iii) Voids in the mineral aggregate
iv) Voids filled with Bitumen. **(10 Marks)**

Module-4

7 a. What are the methods of soil stabilization? Explain briefly. **(10 Marks)**

b. What are the various types of excavation equipment used in highway construction? Mention the applications and limitations of these excavation equipments. **(10 Marks)**

OR

8 a. Explain the construction procedure of embankment/subgrade. Mention the quality control checks conducted in laboratory and field with specifications. **(10 Marks)**

b. What are the major components of a Bituminous hot- mix plants. Explain them briefly. **(10 Marks)**

Module-5

9 a. What are the material specification of the Bituminous concrete layer in flexible pavement? Explain briefly, the construction procedure and quality control checks for bituminous concrete layer. **(10 Marks)**

b. With the material specification explain the various steps performed in the construction of dry lean concrete (DLC) layer in cement – concrete pavements. **(10 Marks)**

OR

10 a. Write the gradation of aggregates used in dense graded Bituminous macadam layer construction. Explain the quality control checks. **(10 Marks)**

b. Explain the procedure for construction of Pavement Quality Concrete (PQC) in C-C pavements with material specifications. Explain the quality control checks. **(10 Marks)**

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