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## Sixth Semester B.E. Degree Examination, July/August 2021 Highway Engineering

Time: 3 hrs.

Max. Marks: 80

**Note :** 1. Answer any FIVE full questions.  
2. Use of IRC codes and charts are allowed.

- 1 a. Explain the role of transportation in the development of the country and write the different modes of transport. (06 Marks)  
b. What are the important recommendations of Jayakar Committee? (04 Marks)  
c. Explain the objectives of the following : (06 Marks)  
i) HRB ii) IRC iii) CRF.
- 2 a. List and explain the different planning surveys required for highways. (06 Marks)  
b. What are the policies and goals of fourth development plan? (06 Marks)  
c. Outline the essential features of the PMGSY. (04 Marks)
- 3 a. What are the main objectives of the Preliminary survey and the steps followed in the Preliminary survey by Conventional methods. (08 Marks)  
b. What are the ideal requirements of highway alignment? List and explain briefly. (08 Marks)
- 4 a. Explain the various factors governing the geometric design of a highway. (07 Marks)  
b. Explain the objectives of providing : (09 Marks)  
i) Camber ii) Super elevation iii) Overtaking zone.
- 5 a. Explain the desirable properties of road aggregates. List and explain any one test conducted in detail on road aggregates to determine the properties. (08 Marks)  
b. Differentiate between : i) Bitumen and Tar ii) Cutback and Emulsion. Also list the desirable properties of bitumen and the tests conducted on bitumen. (08 Marks)
- 6 a. Draw a typical flexible pavement c/s indicating the different component layers. Also mention the functions of each layer. (08 Marks)  
b. List and explain the various design factors to be considered for flexible pavements. (08 Marks)
- 7 a. Write the specification for materials and step by step construction procedure for Bituminous concrete. (08 Marks)  
b. What is WMM? Describe the method of construction of WMM roads. (08 Marks)
- 8 a. Mention the tests, gradation and requirements as per IRC for aggregates used in Pavement Quality Concrete (PQC). (08 Marks)  
b. Enumerate the construction steps for WBM road construction. (08 Marks)
- 9 a. Briefly outline the requirement of highway drainage system. (08 Marks)  
b. Indicate any two methods of subsurface drainage. Explain with neat sketches. (08 Marks)



- 10 a. Briefly explain the various highway user benefits. (08 Marks)  
b. Calculate the Annual cost of a sketch of highway from the following particulars :

Item	Total cost Rs , in lakhs	Estimated life, years	Rate of interest , %
Land	35.0	100	6
Earth work	40.0	40	8
Bridges, Culverts and drainage	50.0	60	8
Pavement	100.0	15	10
Traffic signs and road appurtenances	15.0	5	10

The average cost of maintenance of the road is Rs 1.5 lakhs per year. (08 Marks)

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