Code No: **R42017** **R10** **Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2014

PAVEMENT ANALYSIS DESIGN AND EVALUATION

(Civil Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
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1 a) List out the different methods of road construction with their advantages and limitations. [7]
b) What are the advantages and draw backs of cement concrete roads in comparison with bituminous roads. [8]

2 a) Describe the various methods of controlling reflection cracks in bituminous concrete roads. Give reasons for adopting a most suitable method. [7]
b) Enumerate the types and causes of failure in a concrete pavement and suggest remedial measures for repairing them. [8]

3 a) Discuss special repairs in flexible and cement concrete pavements. [8]
b) Explain maintenance measures adopted for (i) Earthen roads (ii) WBM roads. [7]

4 a) Write a note on (i) Falling weight deflectometer (ii) dynamic cone penetrometer with regard to the concept of functioning, methodology and use [8]
b) Discuss (i) Pavement serviceability index (ii) Present serviceability rating [7]

5 a) Explain the method of strengthening of existing pavements in the following cases (i) Flexible overlay on the existing flexible pavement (ii) flexible overlay on the existing cement concrete road [8]
b) Enumerate overlay design by Benkelman beam deflection studies. [7]

6 a) What are the requirements of a good Highway drainage system [7]
b) Explain how the surface water is collected and disposed off in rural and urban roads. What are the problems of surface water in hill roads? [8]

7 a) Discuss the term Inventory of road with reference to Highway management system [7]
b) Enumerate major classes of activities in a pavement management system with the aid of a flow chart. [8]

8 a) What do you understand by Asset management? Discuss the concepts. [8]
b) Write a note on stages of maintenance management planning. [7]

Code No: **R42017** **R10** **Set No. 2**

IV B.Tech II Semester Regular Examinations, April/May - 2014

PAVEMENT ANALYSIS DESIGN AND EVALUATION

(Civil Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are the requirements of materials, plants and equipment for cement concrete road construction? Describe briefly. [7]
b) Compare the following with advantages and disadvantages
(i) central plant mix with road mix method (ii) hot mix with cold mix. [8]

2 a) What are the various causes of formations of waves and corrugations in flexible pavements? Explain the remedial measures. [8]
b) Write a detailed note on
(i) scaling of cement concrete (ii) mud pumping (iii) spalling of joints. [7]

3 a) Discuss briefly the importance of Highway maintenance. [8]
b) What are the various methods of strengthening cement concrete pavements? [7]

4 a) Discuss the following procedures for pavement evaluation
(i) Benkelman beam deflection study (ii) Static and impulse loading [9]
b) What are the causes of pot holes and discuss step by step procedure to repair the same. [6]

5 a) What are the different types of overlays and explain their uses [9]
b) Discuss overlay design steps [6]

6 a) Specify the design approach for surface drainage system of a Highway. [7]
b) Discuss how the problem of road construction in waterlogged areas may be solved. [8]

7 a) List out the various data to be collected for pavement management system. [7]
b) Discuss the need for an effective pavement management system. [8]

8 a) Enumerate (i) Traffic management (ii) Safety management [8]
b) Discuss when do you opt for construction of bridges in road networks. [7]

Code No: **R42017** **R10** **Set No. 3**

IV B.Tech II Semester Regular Examinations, April/May - 2014

PAVEMENT ANALYSIS DESIGN AND EVALUATION

(Civil Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain briefly the construction of earth roads. Discuss the advantages and limitations of earth roads. [7]
b) What are the various types of bituminous road constructions in use? Discuss the advantages and limitations of each. [8]

2 a) Write a details note on failures due to consolidation of pavement layers and remedial measures [8]
b) Explain the various types of failures in concrete pavements and their causes. Suggest remedial measures for repairing them. [7]

3 a) Explain routine maintenance and periodic maintenance strategies followed in maintenance of Highways. [9]
b) Write a detailed note on special repairs in flexible pavements. [6]

4 a) Write a descriptive note on pavement evaluation [8]
b) Discuss various pavement surface characteristics that need evaluation. What are the limiting values? [7]

5 a) Why are overlays required? What are the factors to be considered in their design? [8]
b) How do you strengthen the existing pavements in the following cases
(i) Rigid overlay on the existing rigid pavement
(ii) rigid overlay on the existing flexible pavement [7]

6 a) Discuss importance of Highway Drainage with special emphasis on Hill roads [7]
b) Explain with neat sketches how the subsurface drainage system is provided to lower water table and control seepage flow. [8]

7 a) How do pavement management systems and maintenance management systems relate to each other? How do they differ? [8]
b) Discuss the need for an effective pavement management system. [7]

8 a) Discuss the various safety management techniques. [7]
b) Why is Asset management required? What are the various components of the same? [8]

Code No: **R42017** **R10** **Set No. 4**

IV B.Tech II Semester Regular Examinations, April/May - 2014

PAVEMENT ANALYSIS DESIGN AND EVALUATION

(Civil Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are the desirable properties of road materials used in different pavement layers of flexible pavements? [8]
b) Write down construction steps for water bound macadam roads. Explain where are these used. [7]

2 a) Describe the various methods of controlling reflection cracks in bituminous concrete roads. Give reasons for adopting a most suitable method, [7]
b) Explain the various types of joints in cement concrete pavements and the failure modes in them. [8]

3 a) Discuss in detail special repairs in cement concrete pavements [8]
b) Explain the procedure of patch repair works in
(i) WBM pavement (ii) Bituminous Pavement. [7]

4 a) Discuss various pavement surface characteristics that need evaluation. What are the limiting values? [8]
b) Write a note on [7]
(i) Pavement serviceability index (ii) Present serviceability rating

5 a) Enumerate overlay design by Benkelman beam deflection studies [8]
b) A failed cement concrete pavement is to be strengthened by providing bituminous concrete overlay. Discuss the method to be adopted. [7]

6 a) Discuss methodology to be followed for road construction on
(i) hilly areas (ii) water logged area [7]
b) Explain the phases of Hydrologic analysis and Hydraulic analysis in design of Surface Drainage system [8]

7 a) Write in detail the various pavement deterioration models in PMS [7]
b) Discuss project level and network level management strategies [8]

8 a) How is traffic management done? Discuss any one of the models [8]
b) What do you understand by network management? Explain [7]