

"Heaven's Light is Our Guide"

Rajshahi University of Engineering & Technology

Department of Civil Engineering

4th year 7th semester examination 2016



CE-451

Transportation Engineering-II

MEJBAUL ISLAM

CE-120003

SEC: A

CE-451
Transportation Engineering-II
Railway

1. Define railway track & state the requirements of an ideal railway track. **14,13,12,11,10**
2. Define capacity of railway track & suggest measures to increase it. **11,06,05**
3. Explain the causes of failure of railway embankment. **09,06,05**
4. Draw a typical single line railway track in cutting showing full details. **07**
5. Name the different components of a railway track and discuss the functions of each components. **10**
6. Define gauge of a railway track. Discuss the factors which affect the choice of rail gauge. **14,13,12,11,05**
7. What are the disadvantages of adopting different gauges on the railways? **09,07**
8. Define track alignment. Discuss the factors which control the alignment of railway track. **14,13,11,08,05**
9. Discuss the various causes of wear of rails and suggest suitable remedial measures. **10**
10. Draw a typical single line track on embankment showing full details. **12**
11. Differentiate between:
 - i. Hogged & check rail. **10**
 - ii. Corrugated & corroded rail. **10**
 - iii. Loading gauge & construction gauge. **08,07**
 - iv. Broad gauge & meter gauge. **08**
12. Write Short notes on:
 - i. Coning of wheel, Hogging of rail, Roaring of Rail, Construction gauge, Capacity of a railway track, Corrugation of rail, check rail, Marshalling yard. **14,13,11,10,09,07,06,05**
 - ii. Buffer stops, Compensator, Negative Super elevation & Fouling mark. **14,13,11,08**
 - iii. Sleeper density, cant deficiency, Ruling gradient. **13**
 - iv. Interlocking, Compensator, Water column. **13,12,11,07**
 - v. Creep of rails, Fastening of rails & Sleeper density. **12**
 - vi. Sleeper density, concrete sleeper, Welded rail. **10,08**
 - vii. Rail gauge, Spike, Fish plates, Depth of Ballast cushion. **04**
 - viii. Switch, crossing number, interlaced sleepers, level crossing. **10,06**
13. What do you mean by coning of wheels? How does it effects the rails? **09**
14. Describe the factors which influence the selection of site for a railway station. **14,13,08,06,05**
15. Why is the maintenance of a railway track necessary? List the various items of maintenance. What are the causes of accidents? **14,13,08,07**
16. Deduce an expression for the determination of degree of the curve in the field. **10**
17. What are the desirable properties of good ballast? **11,10**
18. What material as ballast you would recommend for high speed track and why? **10**
19. What is a sleeper? What should be the requirements of ideal material of the sleeper? **13,08,06,05**
20. Explain the necessity of ballast in railway track or function of ballast. **08,06,05**

21. Describe the merits and demerits of wooden sleepers. **09**
22. Discuss the merits & demerits of different types of sleepers. **07**
23. Explain the functions of sleepers in railway track. **11**
24. What is rail joint? Describe the characteristics of a good rail joint. **10**
25. What are the requirements of an ideal fastening? **07**
26. Draw a neat sketch of a right hand turnout and show various parts on it. **12**
27. What do you mean by signaling? Write down the objectives and classifications of signaling which are based on the railway track. **12,09,06,05**
28. Draw a typical layout of signal at the divergent junctions and convergent junction. **07**
29. Draw a neat sketch of a semaphore signal. **08,06**
30. What are the causes of railway accidents? Suggest some preventive measures to minimize the accident. **09**

Highway

1. How subgrade is prepared? Briefly discuss the methods of soil stabilization. **14,13,12,11**
2. Discuss the steps for the preparation of subgrade and write the name of various equipment used. **08**
3. Discuss the scopes and methods of soil stabilization. **10,08,07,06**
4. What are the basic principles in soil stabilization? **05**
5. Classify the pavement on the basis of structural behavior also bring out the points of difference. **05**
6. Define low-cost road. Write the names of low-cost roads. Why are low cost roads preferred in developing countries? **13,11,10,09**
7. Explain in brief the construction procedure of BBM road. **14**
8. What improvement do you suggest to reduce the dust nuisance of WBM road? **06**
9. Explain the steps that must be considered during rolling of WBM road. **07**
10. Define CBR. What are the desirable properties of sub-grade soil? **10**
11. What are the applications of CBR test? **06**
12. With neat sketch. Explain the significance of vertical & wheel load for structural design of road. **11**
13. Discuss the principle and application of soil-bitumen. What are the factors affecting the properties of soil-bitumen. **08,04**
14. What are the factors influencing the properties of soil-cement? Explain how soil-cement mix is designed. **05**
15. Draw a neat sketch of flexible pavement cross section and show its different component. Discuss their functions also. **10**
16. Describe the effects of climatic variations on the design of pavements and their performance. **10**
17. Explain with neat sketch, the effects of contact pressure and wheel load in flexible pavement. **07**
18. Write purpose and methods of application of seal coat, prime coat & tack coat. **04**
19. Explain the importance & functions of sub-grade course & wearing course of a flexible pavement. **13,09,07**
20. Write the precautions adopted during rolling. Discuss the bad effects of defective rolling. **13,11,10,09**

21. Briefly discuss the traffic factors that are considered for the design of flexible pavement. **13,12**
22. Discuss the significance of the design wheel load factors to be considered in flexible pavement design. **09**
23. Write the precautions adopted for rolling WBM road. **12,05**
24. What are the general causes of pavement failure. **08**
25. What are the various types of failure in flexible pavement? Explain the causes. **08**
26. What are the causes of surface failure of in case of bituminous road? Describe the procedure of pothole repair. **13,11**
27. What are the causes of base failure in case of flexible pavement? Explain them. **09**
28. What are the causes of development of pot holes and corrugation in bituminous road and how they are repaired? **12,08,07,06,05**
29. What are the causes of waves and corrugation formation in flexible pavement? Suggest remedial measures. **14**
30. What are the role of mineral aggregate & bitumen in bituminous mix? **07,06**
31. How OBC value is ascertains from the graph? **06**
32. Differentiate between:
- ESWL and EWLF. **14,08**
 - Flexible pavement and rigid pavement. **14,08**
 - Contact pressure and inflation pressure. **14,08**
33. Explain the term “present serviceability index”. **14,08**
34. Explain ‘Flexible and Rigid’ pavements and bring out the points of difference. **06**
35. Write short notes on:
- Prime coat, Frost action, Dowel bar, Soil stabilization, Mud pumping. **14,13,12,11,10,09,06,05**
 - CBR, OBC, G_{mm} , Marshall stability & VMA. **13,12,11,05**
 - WBM road, Stabilized road & Bituminous road. **12**
 - Pot holes, Flow, Tack coat, Soaked CBR. **09,08**
 - ESWL, seal coat, Warping stress, Radius of relative stiffness. **07,05,04**
36. What are the requirements of good joint filler and sealer materials? Explain with neat sketches. **14,13,12,11,10,09,08,06,05**
37. Why joints are intentionally provided in rigid pavement? **07,06**
38. What are the desirable properties of joint filler and sealer? **08,07,05**
39. Discuss the object of the following types of joint with neat sketches: **09**
- Expansion joints.
 - Contraction joints.
 - Longitudinal joints.
40. For rigid pavement, explain the statement “joint is nothing but is design crack. **11,05**
41. Draw a neat sketch of expansion joint provided in rigid pavement. **11**
42. Briefly discuss the various joints provided in rigid pavement. **13,12,10**
43. Define CBR. Why and how soaked CBR value is determined in the laboratory? **14**
44. Write short note on CA and Bitumen in bituminous mix. **14**
45. What is the role of bitumen, aggregates & filler in bituminous mix? **04**
46. Briefly discuss the necessary steps of bituminous mix design. **14,05**

47. What are the desirable properties of bituminous mixes? **05**

Waterway

1. Explain the importance of waterway in our country. Why is shore protection necessary? **14,11,10.**
2. Explain with neat sketches shore protection structures. **08**
3. Discuss the advantages and disadvantages of waterway mode of transportation. **09,08,05**
4. What are the requirements of a good port? **06**
5. Explain the importance of dock yard. **05**
6. Write short notes on: **(with neat sketches)**
 - I. Break water, Docks, Jetty, Littoral drift, Coastal structures. **14,12,11,09**
 - II. Jetties, Docks, Bulk heads, Revetment & Sea walls. **13,11,09,06**
7. Define waterway transportation. What are the advantages & disadvantages of waterway transportation? **12**
8. Define harbor. What are the requirements of a good harbor? What are the factors which effect the site selection of a harbor? **13,12,09**
9. What are the factors to be considered before sketching a site for harbor? **11**
10. Difference between:
 - i. Port and harbor. **11,10,08,07,06,05**
 - ii. Jetty and break water. **08,07,06,05**
 - iii. Dry dock and wet dock. **08,07,06,05**

Problems

- Bituminous mix design.
- CBR method.
- Thickness calculation/design of rigid and flexible pavement.
- Requirements of track components of 1km BG/MG track.
- Switch.
- Super elevation.
- Crossing number, heel divergence related math.

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