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Sixth Semester B.E. Degree Examination, June/July 2015
Transportation Engineering – II

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What are the requirements of rails? (06 Marks)
b. Explain the following :
i) Theories and causes of creep
ii) Types of rail joints. (08 Marks)
c. Compare flat footed rails with DH and BH rails. (06 Marks)
- 2 a. What are the requirements of a good ballast material? Mention the different types of ballast used. (06 Marks)
b. Determine the quantity of materials required to construct a 16 km long B.G rail way track. Assume a sleeper density of $m + 5$ and weight of rail section as 52 kg/m length. (06 Marks)
c. Calculate the maximum permissible train load that can be pulled by a locomotive having 4 pairs of driving wheels, carrying an axle load of 22 tonnes each. The train has to run at a speed of 80 kmph on a straight level B.G track. Also calculate the reduction in speed if the train climbs a gradient of 1 in 150. If the train climbs the gradient with a 4° curve, then what should be the reduction in speed. Take $\mu = 0.166$. (08 Marks)
- 3 a. List the different types of curves used on railways. Explain the necessity of transition curves. (06 Marks)
b. What is grade compensation on curves? If the ruling gradient is 1 in 150 on a particular section of B.G track and at the same time a curve of 4° is situate on this ruling gradient, what should be the allowable ruling gradient? (06 Marks)
c. A 5° curve diverges from a 3° main curve in the layout of a B.G yard. If the speed of the branch line is restricted to 35 kmph, find out the maximum permissible speed on the main line. Allowable cant deficiency is 7.6 cm. (08 Marks)
- 4 a. Draw a neat sketch of a right hand turnout and show its various components. (06 Marks)
b. With a neat sketch, explain the working of a semaphore signal. (06 Marks)
c. List the types of yards in railways. Explain marshalling yards and the different types of marshalling yards. (08 Marks)

PART – B

- 5 a. Explain the characteristics of an aircraft which affects the planning and design of airports. (06 Marks)
b. Explain the factors that influence the site selection for an airport. (06 Marks)
c. Draw a neat sketch of an airport with single runway and explain the functions of the component parts. (08 Marks)

- 6 a. Explain the various factors which affect the location of exit taxiways. (06 Marks)
- b. A taxiway is to be designed for operating Boeing 707-320, which has the following characteristics. Determine the turning radius of the taxiway.
Wheel base = 17.7 m
Tread of main loading gear = 6.62 m
Turning speed = 40 kmph
Coefficient of friction between tyre and pavement surface = 0.13. (06 Marks)
- c. The length of runway under standard conditions is 1700 m. The airport site is at an elevation of 260 m. Its reference temperature is 32°C. If the runway is to be constructed with an effective gradient of 0.20 percent, determine the corrected runway length. (08 Marks)
- 7 a. Write short notes on :
i) Tunnel lining
ii) Tunnel drainage. (08 Marks)
- b. Explain with a neat sketch, the operation involved in needle beam method of tunneling in soil. (06 Marks)
- c. What is the necessity for ventilation in tunnels? Explain the methods of tunnel ventilation. (06 Marks)
- 8 a. Define the term harbour. Explain various classifications of harbours. (06 Marks)
- b. What are the factors to be considered while selecting a site for a harbour? (06 Marks)
- c. What is a breakwater? Explain the mound type of breakwater with a neat sketch. (08 Marks)
