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10CV63

Sixth Semester B.E. Degree Examination, June/July 2018
Transportation Engineering - II

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions, selecting atleast TWO questions from each part.*
2. *Draw neat sketches wherever required.*
3. *Assume any missing data suitably.*

PART – A

1   a. Discuss the factors governing the choice of gauge for a railway track.   **(06 Marks)**
    b. List the requirements of an ideal rail joint.   **(06 Marks)**
    c. Draw the cross section of double line BG track in cutting (straight stretch).   **(08 Marks)**

2   a. Explain the functions of sleepers.   **(06 Marks)**
    b. List the requirements of a good ballast.   **(06 Marks)**
    c. Calculate the maximum train load that a BG locomotive with 4 pairs of driving wheels with axle load of 20 tonnes each, can hour along a straight level track at a speed of 80 kmph. Calculate the reduction in speed on an upgradient of 1 in 50. What would be the further reduction in speed along of 3^0 curve on the upgradient.   **(08 Marks)**

3   a. Discuss the classification of gradients on Indian Railways indicating the adopted values.   **(06 Marks)**
    b. Calculate the maximum permissible speed on a 3^0 BG track if the length of transition curve is 60m and super elevation is 7cm. The maximum values of cant deficiency and speed likely to be sanctioned are 6cm and 70 kmph respectively.   **(06 Marks)**
    c. On a BG track, a 6^0 cure diverger in an opposite direction from a 3^0 main curve. Calculate the allowable speed on the branch line, if the permissible speed on the main line is 65 kmph.   **(08 Marks)**

4   a. Draw a neat line diagram of a left hand turnout showing all the components.   **(06 Marks)**
    b. Calculate the elements of a BG turnout of heel divergence is 11.43 cm. Number of crossing is 16 and angle of switch is $1^0 8' 0"$. Straight arm distance is 0.9m.   **(06 Marks)**
    c. Explain the working procedure of automatic block system of controlling the movement of train.   **(08 Marks)**

PART – B

5   a. List the factors to be considered for an airport site selection. What is a preferential runway?   **(06 Marks)**
    b. Discuss the functions of the components of an airport.   **(06 Marks)**
    c. Determine the best direction for orienting the runway for the wind data given. If the permitted deviation of wind from the direction of landing and take – off is $33^0.75$. Determine the percentage of time in a year during which the runway can be used. **(08 Marks)**

Wind direction	Duration percent	Wind direction	Duration percent	Wind direction	Duration percent	Wind direction	Duration percent
N	7.3	E	5.7	S	7.4	W	3.9
NNE	8.9	ESE	1.7	SSW	5.9	WNW	1.7
NE	14.6	SE	0.6	SW	10.5	NW	1.2
ENE	10.3	SSE	0.4	WSW	8.3	NNW	0.5

6 a. List the assumed conditions under which basic runway length is determined. Sketch and explain the normal take – off case of determining the basic runway length. **(06 Marks)**

  b. An airport is planned at an elevation of 380m above MSL. The monthly mean of average and maximum daily temperature for the hottest month of the year are 28^0C and 40^0C respectively. The effective gradient is 0.178 percent. Determine the length of runway required if the basic runway length is 1900m. **(06 Marks)**

  c. Explain the flight procedure in an ILS with the help of a schematic diagram. **(08 Marks)**

7 a. List the advantages of tunnels over open cuts **(06 Marks)**

  b. Discuss the features and suitability of the different shapes adopted for tunnel cross - section. **(06 Marks)**

  c. Discuss the three methods of mechanical ventilation. **(08 Marks)**

8 a. Tabulate the comparisons between mound type and wall type breakwater. **(06 Marks)**

  b. Enumerate the forces acting on a graving dock. **(06 Marks)**

  c. Draw a neat layout of an artificial harbor and list the functions of the components. **(08 Marks)**

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