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17CV552

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Railways, Harbours, Tunneling and Airports

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1   a.   Discuss the significance of the FOUR major modes of transportation.   (06 Marks)
    b.   Describe the requirements of an ideal permanent way.   (07 Marks)
    c.   An 8° branch curve diverges in an opposite direction from a 5° main curve in a BG yard. Determine the permissible speed on the branch line if the speed on the main line is restricted to 45 kmph.   (07 Marks)

OR

2   a.   Describe the indications of creep and effects of creep.   (06 Marks)
    b.   Describe the requirements of sleepers.   (07 Marks)
    c.   Describe the various types of gradients indicating the recommended values and conditions with examples.   (07 Marks)

Module-2

3   a.   Define plate laying, base and nail-head. Explain the operations in American method of plate laying.   (06 Marks)
    b.   List the various classes of stations. Describe block stations and draw a neat sketch of a class B station with 3 lines.   (07 Marks)
    c.   Describe a sump yard with a neat sketch. List the methods of stopping the rolling down wagons.   (07 Marks)

OR

4   a.   Estimate the quantities of materials required to construct 2 km length of BG railway track with a sleeper density of M+6.   (06 Marks)
    b.   Discuss the factors to be considered for selecting the site for a railway station.   (07 Marks)
    c.   Describe a marshalling yard with a neat sketch.   (07 Marks)

Module-3

5   a.   List the classification of harbours and draw a neat sketch of the layout of an artificial harbor with components.   (10 Marks)
    b.   Discuss the advantages and disadvantages of tunnels.   (10 Marks)

OR

6   a.   List the types of breakwaters and discuss the characteristics of mound breakwaters.
                                                                                      (10 Marks)
    b.   Explain the three systems of mechanical ventilation of Tunnels.   (10 Marks)

Module-4

7   a.   Discuss the advantages and limitations of air transport.   (06 Marks)
    b.   Draw a neat sketch of an airport with open parallel concept of runways and explain the functions of the components.   (10 Marks)
    c.   Describe the data to be collected for preparing a sand and scientific regional plan.   (04 Marks)

OR

8 a. Discuss the importance of vehicular circulation and parking area at airports and list the points to be considered for an efficient system. **(06 Marks)**

    b. List the factors to be considered while selecting a suitable site for a major airport and explain the features of a preferential runway with sketches. **(10 Marks)**

    c. Draw a neat sketch of an airport with offset parallel concept of runway showing the components. **(04 Marks)**

Module-5

9 a. Explain (i) Cross wind component (ii) Wind coverage (iii) Calm period. **(06 Marks)**

    b. Determine the turning radius of the taxiway for operating a subsonic jet aircraft of wheat base 17.70m and tread of main gear 6.62m. Turning speed is 40 kmph. Airport is of type A. **(06 Marks)**

    c. Tabulate the summary of runway geometrics as per ICAO. **(08 Marks)**

OR

10 a. Explain the procedure of determining the best direction of orienting the runway as per Type-I wind rose diagram with assumed data. **(06 Marks)**

    b. List the assumed conditions under which basic runway length is determined. Explain the normal landing case. **(06 Marks)**

    c. The basic runway length required for a proposed airport is 1800 m. The airport site is at an elevation of 450 m above MSL. The monthly mean of average and maximum daily temperature for the hottest month of the year are 26°C and 38°C respectively. Determine the corrected length of runway required if the effective gradient is 0.22 percent. **(08 Marks)**

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