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18CV645

Sixth Semester B.E. Degree Examination, July/August 2022
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 conventional method of route alignment survey. (08 Marks)
b. Discuss the significance of road, rail, water and air transport. (06 Marks)
c. Explain the following :
i) Coning of wheel with diagram
ii) Turnout with a neat sketch
iii) Negative super elevation with a neat sketch. (06 Marks)

OR

- 2 a. List the requirements and explain the types of rails. (07 Marks)
b. Explain the functions and requirements of ballast. (05 Marks)
c. What would be the permissible speed on the curve if on a 8°MG track, the average speed of different trains is 50kmph and allowable Cant deficiency is of that of maximum Cant deficiency. (08 Marks)

Module-2

- 3 a. Explain the maintenance of railway track. (06 Marks)
b. Discuss the stabilization methods of track on poor soil. (06 Marks)
c. Demonstrate the modern methods of track maintenance. (08 Marks)

OR

- 4 a. Describe a sump yard with neat sketch. List the methods of stopping the rolling down wagons. (07 Marks)
b. Explain the classification of railway station. (06 Marks)
c. Mention the passenger amenities to be provided in railway station. (07 Marks)

Module-3

- 5 a. List the types of break water and discuss the characteristics of mound break water. (08 Marks)
b. Write a note on tunnel drainage and tunnel lining. (06 Marks)
c. With a neat sketch explain the linear plate method. (06 Marks)

OR

- 6 a. List the classification of harbours and draw a neat sketch of the layout of an artificial harbor with components. (10 Marks)
b. Explain the three systems of mechanical ventilation of tunnels. (10 Marks)

Module-4

- 7 a. Draw a neat sketch of an airport with open concept of runways and explain the functions of the component. (10 Marks)
b. List the factors to be considered while selecting a suitable site for a major airport and explain the features of preferential runway with sketch. (10 Marks)

OR

- 8 a. Write a note on parking and circulation area. (07 Marks)
 b. Explain the characteristics of air transport. (06 Marks)
 c. Explain the aircraft characteristics which affect the airport design. (07 Marks)

Module-5

- 9 a. Explain the procedure of determining the best direction of orienting the runway as per type-I wind rose diagram with assumed data. (10 Marks)
 b. A runway length required for landing at sea level in standard atmospheric condition is 3000m. Runway length required for take-off at a sea level site in standard atmospheric condition is 2500m. Aerodrome reference temperature is 25°C and that of standard atmosphere at aerodrome elevation of 150m is 14.025°C if the effective gradient is 0.5%. Determine the runway length is to be provided. (10 Marks)

OR

- 10 a. Explain the passenger facilities and services available at airport. (05 Marks)
 b. Explain the different types of lighting used in airport. (05 Marks)
 c. Wind rose data shown in table the permissible cross wind component is 25kmph. Determine the period the best direction of runway and total wind coverage.

| Wind direction | Deviation of wind percentage | | |
|----------------|------------------------------|--------------|--------------|
| | 6.4 – 25 kmph | 25 – 40 kmph | 40 – 60 kmph |
| N | 7.4 | 2.7 | 0.2 |
| NNE | 5.7 | 2.1 | 0.3 |
| NE | 2.4 | 0.9 | 0.6 |
| ENE | 1.2 | 0.4 | 0.2 |
| E | 0.8 | 0.2 | 0 |
| ESE | 0.3 | 0.1 | 0 |
| SE | 4.3 | 2.8 | 0 |
| SSE | 5.5 | 3.2 | 0 |
| S | 9.7 | 4.6 | 0 |
| SSW | 6.3 | 3.2 | 0.5 |
| SW | 3.6 | 1.8 | 0.3 |
| WSW | 1 | 0.5 | 0.1 |
| W | 0.4 | 0.1 | 0 |
| WNW | 0.2 | 0.1 | 0 |
| NW | 5.3 | 1.9 | 0 |
| NNW | 4 | 1.3 | 0.3 |

(10 Marks)
