

- (b) (i) What is the necessity of geometric design of a railway track? Enumerate the significant features of design of a railway track.
- (ii) What are the requirements of an ideal rail joint? Explain any two joints used in Indian Railway lines with neat sketches.
12. (a) (i) What are points and crossings? What are their types? Draw sketch of left hand turnout and explain various terms involved. (12)
- (ii) Enumerate the different classification of signals. (4)

Or

- (b) (i) Explain the centralised traffic control system.
- (ii) What is a marshalling yard? Explain with a neat sketch, the working of a hump type of marshalling yard.
13. (a) (i) Describe the various factors to be considered for selection of site for an airport.
- (ii) The wind data obtained from an airport site over a period of 5 years are given below. Draw the wind rose diagram (Type - I) to a suitable scale on a graph paper. Determine calm period, the best orientation of runways and the total wind coverage.

Wind direction	Average duration of wind, percent with wind velocity in Km/h		
	6 - 25	25 - 40	40 - 60
N	2.5	0.9	0.5
NNE	1.2	0.4	0.2
NE	0.8	0.2	0.0
ENE	0.3	0.1	0.0
E	4.2	2.5	0.4
ESE	5.2	3.2	0.1
SE	9.6	4.8	0.2
SSE	6.5	3.0	0.5
S	3.2	1.8	0.4
SSW	1.1	0.4	0.1
SW	0.3	0.1	0.0
WSW	0.2	0.1	0.0
W	5.0	1.8	0.1
WNW	3.9	1.3	0.3
NW	7.1	2.8	0.3
NNW	5.6	2.2	0.4

Or

- (b) (i) State briefly the importance of drainage in airports.
(ii) A taxi-way is to be designed for a supersonic transport which has the following characteristics. Determine the turning radius of the taxi-way.

Wheel base – 31 m.

Tread of main landing gear – 7.20 m.

Turning Speed – 60 kmph.

Coefficient of friction between tyre and pavement surface – 0.13.

14. (a) (i) What are the facilities that are to be provided in the terminal building of an international airport?
(ii) Mention the various types of airport marking. Explain with neat sketch the runway marking.

Or

- (b) (i) Draw a typical sketch showing the general lighting pattern for a International airport.
(ii) Explain in brief the need of air traffic control.
15. (a) (i) Define a port and bring out the difference between a port and a harbour. What are the requirements of a good port?
(ii) Define dredging. Explain the reasons for its adoption. How dredged materials are disposed off?

Or

- (b) (i) Classify different types of break water. Explain any one in brief.
(ii) What do you understand by the term “Navigational aids”? Why are they provided in harbours? Explain with a sketch any one of them.