Reg. No. : | | | | | | | | | | | |

Question Paper Code : **70300**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Sixth Semester

Civil Engineering

CE 6604 — RAILWAYS, AIRPORTS AND HARBOUR ENGINEERING

(Common to PTCE 6604 – Railways, Airports and Harbour Engineering for
B.E. (Part-Time) – Civil Engineering – Fourth Semester – (Regulations – 2014))

(Regulations 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Compare any two characteristics of Railways with that of Roads.

2.   Define super elevation in railways.

3.   Define tunneling.

4.   What is marshaling yard?

5.   Write a short note on hangar.

6.   List the different types of aircraft parking systems.

7.   Define Hangar.

8.   What is Taxiway and why it is provided in an airport?

9.   What is a satellite port and give an example?

10. Define Littoral Drift.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Elucidate the advantages of railways over the other modes of transport. (7)

    (ii) Draw a neat sketch of the permanent way and explain the functions of different components. (6)

Or

    (b) (i) Derive an expression for the relationship between super elevation, gauge and curve in a railway track. (7)

    (ii) Discuss the functions and requirements of various elements of railway permanent way. (6)

12. (a) Discuss in detail the methods of constructing of railway track. (13)

Or

    (b) What are the various types of signals utilized in a railway line? (13)

13. (a) Enlist and explain the factors to be considered for the selection of site of an airport.

Or

    (b) What are the facilities to be provided in the terminal building of an International airport?

14. (a) (i) Following is the average wind data for ten years, when wind intensity is above 6km/hr. An airport is to be designed for two runways. Determine the best runway orientation and calculate total wind coverage. (7)

Wind direction	Percentage of time
N	6.5
NNE	10.4
NE	8.0
ENE	4.2
E	1.7
ESE	0.6
SE	0.7
SSE	3.9
S	7.5
SSW	14.5
SW	10.2
WSW	5.9
W	4.2
WNW	0.3
NW	0.2
NNW	4.8

(ii) Length of a runway at mean sea level, standard temperature and zero gradients is 1600 m. The site has an elevation of 320 m, with a reference temperature 33.6 degree centigrade. The runway has to be constructed with an effective gradient of 0.25%. Determine the actual length of runway at the site. (6)

Or

(b) Draw neat sketches and explain the 'Approach zone profile' and 'Clearance over Highways and Railways' for an Instrument Landing System Runway. (13)

15. (a) Explain about the following terms in detail.

(i) Piers, Quays and Docks. (4)

(ii) Wharfs. (4)

(iii) Breakwater. (5)

Or

(b) (i) What are the requirements of a good harbour? (6)

(ii) Explain in detail about the classification of harbours. (7)

PART C — (1 × 15 = 15 marks)

16. (a) Evaluate the capacity of 12 Gates which are exclusively used by three classes of aircraft with particulars as shown below. Assume gate utilization factor as 1.

AIRCRAFT TYPE	GATE GROUP	NO. OF GATES	MIX (%)	AVERAGE OCCUPANCY TIME IN MINUTES
A	I	2	15	25
B	II	4	35	45
C	III	6	50	60

Or

(b) Evaluate the equilibrium speed and design the cant to be provided on a BG curve of 3 degree if the speeds of several trains running on the line as follows.

No. of trains	Velocity in kmph
15	50
12	60
8	70
3	80

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