Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) ARREAR END SEMESTER EXAMINATIONS, NOV/DEC 2024

CIVIL ENGINEERING

CE5602 - RAILWAYS, AIRPORT AND HARBOUR ENGINEERING

(Regulation 2019)

Time: 3hrs Max.Marks: 100

CO 1 Understand the concepts and elements in Planning, Design and Construction of Railways.

CO 2 Select appropriate methods for construction and maintenance of Railway tracks and other infrastructures.

CO 3 Understanding the concepts and elements in Planning and selection of site for airport.

CO 4 Design the runway length and evaluate the orientation of runways.

CO 5 Understand the terminologies, infrastructure in Harbour Engineering and Coastal regulations.

BL – Bloom's Taxonomy Levels
(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Draw the Cross Section of a permanent way	2	1	L1
2	What is creep in rails.	2	1	L2
3	Calculate number of Rails required to construct 100 km of Railway Track.	2	2	L1
4	Write the significance of track maintenance.	2	2	L2
5	List out the functions of AAI.	2	3	L1
6	Write short note on Hangar and its types	2	3	L1
7	Write short note on Approach Zone.	2	4	L1
8	Write short note on cross wind component.	2	4	L2
9	Write the primary classification of Harbour.	2	5	L2
10	Define Coastal Regulation Zone.	2	5	L1

PART- B (5 x 13 = 65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a) (i)	Explain in detail the functions and requirements of Ballast.	8	1	L3
(ii)	Briefly explain any two defects in rails.	5	1	L3
	OR			
11 (b)	A 7° curve diverges from a 3°main curve in reverse direction in the layout of a B.G. yard. If the speed on the main line is restricted to 55 km.ph. Determine the restricted speed on the branch line.	13	1	L3
12 (a) (i)	Discuss in detail the various method of Railway Track construction.	13	2	L3
	OR			

12 (b)	Explain in detail the procedure and methods of Tunnel construction in Hard Rocks.	13	2	L3
13 (a)	Write a descriptive note on the factors influence the selection of site for an airport.	13	3	L3
	OR			
13 (b)	Explain the concept of planning the terminal Building.	13	3	L3
14 (a)	The average wind data collected for 10 years is given below, The airport is designed for a single runway. Determine the best Orientation of runway.	13	4	L4

Wind Direction	Percentage of Time		
	6 – 25km/hr	25 – 50km/hr	50 – 80km/hr
N	4.60	1.90	0.10
NNE	3.40	0.75	0.00
NE	1.80	0.03	0.10
ENE	2.80	0.02	0.03
E	2.10	2.20	0.00
ESE	5.40	4.75	0.00
SE	6.40	1.40	0.00
SSE	7.50	0.02	0.00
S	4.60	1.40	0.10
SSW	2.40	0.75	0.03
SW	1.20	0.03	0.00
WSW	3.60	0.02	0.00
W	1.80	2.20	0.00
WNW	6.00	4.75	0.00
NW	5.90	1.40	0.00
NNW	6.80	4.90	0.30

	OR			
14 (b) (i)	Explain in detail about the Runway and Taxiway Markings	13	4	L4
15 (a)	Discuss in detail the factors influence the site selection of Harbour.	13	5	L3
	OR			
15 (b)	Draw the layout of an Artificial Harbors and explain about its Various components.	13	5	L3

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16.	An airport is proposed at an elevation of 400m above mean sea level where the mean of the maximum and mean of the average daily temperature of the hottest month are 44.8°C and 26.2°C respectively. Maximum elevation difference along the proposed profile of a runway is 6.3m. Basic length of the runway is 1300m. Determine the actual length of the runway to be provided.	15	4	L5