

Department of Civil Engineering

5th Semester Winter 20225

Name of the Faculty: **MANARANJAN PATRA**

Theory No:03

Subject: Railway & Bridge Engineering

Week No. Chapter No. Class Day Lecture No.

Topic to be covered

Section – A: RAILWAYS

Week No.	Chapter No.	Class Day	Lecture No.	Topic to be covered	
1	1	1	1	Introduction	
		2	2	1.1 Railway terminology	
				1.2 Advantages of railways	
	2		3	3	1.3 Classification of Indian Railways Permanent way
			4	4	2.1 Definition and components of a permanent way
					2.2 Concept of gauge
					2.2 different gauges prevalent in India
	2	2	1	5	2.2 suitability of these gauges
			2	6	Track materials
		3		3	7
					3.1.1 Functions and requirement of rails
					3.1.2 Types of rail sections, length of rails
					3.1.3 Rail joints – types, requirement of an ideal joint
					3.1.4 Purpose of welding of rails & its advantages
					3.1.5 Creep- definition, cause & prevention
					3.2 Sleepers
					3.2.1 Definition, function & requirements of sleepers
3		4	12	3.2.2 Classification of sleepers	
				3.2.3 Advantages & disadvantages of different types of sleepers	
				3.3 Ballast	
				3.3.1 Functions & requirements of ballast	
				3.3.2 Materials for ballast	
				3.3.2.1 Functions for Broad gauge	
4	3	2	14	3.4.1 Connection of rails to rail-fishplate, fish bolts	
		3	15	3.4.2 Connection of rails to sleepers	
		4	16		
		1	17		

5	4	2	18	Geometric for broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment	
		3	19		
6	4	4	20	4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment	
		1	21	4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment	
		2	22	4.2 Permanent & temporary land width	
		3	23	4.2 Permanent & temporary land width	
		4	24	4.3 Gradients for drainage	
7	4	1	25	4.3 Gradients for drainage	
		2	26	4.4 Super elevation – necessity & limiting valued	
		3	27	4.4 Super elevation – necessity & limiting valued	
		5	28	Points and crossings 5.1 Definition, necessity of Points and crossings	
8	5	1	29	5.1 Definition, necessity of Points and crossings	
		2	30	5.2 Types of points & crossings with the diagrams	
		3	31	5.2 Types of points & crossings with the diagrams	
9	6	4	32	Laying & maintenance of track 6.1 Methods of Laying & maintenance of track	
		1	33	6.1 Methods of Laying & maintenance of track	
		2	34	6.2 Duties of a permanent way inspector	
		3	35	6.2 Duties of a permanent way inspector	
		Section – B: BRIDGES			
		Introduction to bridges			
10	2	1	36	1.1 Definitions	
		4	36	1.2 Components of a bridge	
		1	37	1.3 Classification of bridges	
		1	37	1.4 Requirements of an ideal bridge	
10	2	2	38	Bridge site investigation, hydrology & planning 2.1 Selection of bridge site, Alignment	
		3	39	2.2 Determination of Flood Discharge	

11	2	4	40	2.3 Waterway & economic span
		1	41	2.4 Afflux, clearance & free board
		2	42	2.4 Afflux, clearance & free board
	3	3		Bridge foundation
		4	43	3.1 Scour depth minimum depth of foundation
12	3	4	44	3.1 Scour depth minimum depth of foundation
		1	45	3.2 Types of bridge foundations – spread foundation
		2	46	3.2 Pile foundation- well foundation – sinking of wells
		3	47	3.2 Pile foundation- well foundation – sinking of wells
13	3	4	48	3.2 Caission foundation
		1	49	3.3 Cofferdams
	2	50	3.3 Cofferdams	
	4	3		Bridge substructure and approaches
		4	51	4.1 Types of piers
14	4	4	52	4.2 Types of abutments
		1	53	4.3 Types of wing walls
		2	54	4.3 Types of wing walls
	5	3	55	4.4 Approaches
		4	56	Culvert & Cause ways
15	5	1	57	5.1 Types of culvers – brief description
		2	58	5.1 Types of culvers – brief description
		3	59	5.2 Types of causeways – brief description
		4	60	5.2 Types of causeways – brief description

Manaranjan Patra

Signature of Faculty

Signature of HOD



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