



GOVT. POLYTECHNIC KORAPUT

ACADEMIC SESSION 2020-2021

SEMESTER- 5th

BRANCH - CIVIL ENGINEERING

SUBJECT – RAILWAY AND BRIDGE ENGINEERING

FACULTY NAME – RABINARAYAN HOTA

Period	Module/ Number	Topic to be covered
	UNIT-1	Introduction :Section – A: RAILWAYS
1		Railway terminology
2		Advantages of railways, Classification of Indian Railways
	UNIT-2	Permanent way:
3		Definition and components of a permanent way (with neat sketch of permanent way)
4		Concept of gauge, Different type of gauges prevalent in India
5		suitability of these gauges under different conditions
	UNIT-3	Track materials:
6		Rails: Functions and requirement of rails
7		Types of rail sections, length of rails
8		Rail joints – types of rail joints,
9		Definition of ideal joint & requirement of an ideal joint, Purpose of welding of rails & its advantages
10		OMR Test
11		Definition of creep occurring in rail, causes of creep & prevention measures of creep in rail
12		Sleepers: Definition, function & requirements of sleepers
13		Classification of sleepers
14		Advantages & disadvantages of different type of sleepers
15		Ballast: Functions & requirements of ballast
16		Materials used for ballast
17		Fixtures for Broad gauge:
18		Connection of rails to rail-(fishplate, fish bolt)
19		Connection of rails to sleepers(chair,keys,spikes)
20		OMR Test
	UNIT-4	Geometric for Broad gauge
21		Typical cross - sections of single & double broad gauge
22		railway track in cutting (with neat sketch)
23		Railway track in embankment (with neat sketch) ,Permanent & temporary land width
24		Gradients provided for drainage in railway track
25		Super elevation – necessity of super elevation & its limiting value
	UNIT-5	Points and crossings
26		Terminology used in points & crossing, necessity of Points and crossings
27		Types of points & crossings with tie diagrams
	UNIT-6	Laying & maintenance of track
28		Methods of Laying of railway track, Methods of maintenance of track, Details of a permanent way inspector

29		OMR Test
30		Discussion for internal exam
31		Internal Exam
	UNIT-7	IntroductionsSection – B : BRIDGES
32		Definitions, Terminology used in bridge engineering
33		Components of a bridge
34		Classification of bridges
35		Requirements of an ideal bridge
	UNIT-8	Bridge Site investigation, hydrology & planning
36		Selection of bridge site, Bridge alignments
37		Discussion on internal exam questions & distribution of evaluated answer sheet
38		Determination of flood discharge
39		Waterway & economic span
40		Afflux, clearance & free board
41		Collection of bridge design data ,sub surface investigation
42		OMR Test
	UNIT-9	Bridge foundation
43		Scour depth, minimum depth of foundation
44		Types of bridge, foundations – spread foundation
45		pile foundation- pile driving
46		well foundation – sinking of wells, caisson foundation, Cofferdams
47		Discussion on units learned
	UNIT-10	Bridge substructure and approaches
48		Components of bridge sub-structure with diagram
49		Types of piers (open pier,masonry pier, mass concrete pier, fixed pier,cantilever pier,free pier)
50		Types of abutments(typical gravity abutment,U-abutment,spill through abutment, pile bent abutment)
51		Types of wing walls(straight wing wall, splayed wing wall, return wing wall), Bridge Approaches
52		OMR Test
	UNIT-11	Permanent bridges
53		Masonry bridges
54		Steel bridges – classification with sketches
55		Concrete bridges – classification, brief description with sketches
56		Concept of IRC bridge loading
57		Types of IRC loading
	UNIT-12	Culvert & cause ways
58		Definition of culvert and causeway, difference between bridge and culvert
59		Types of culverts &Types of causeways – (brief description)
60		Revision

