LESSON PLAN

Name of Faculty : GAURAV **scipline : Civil Engineeri L T P**
Subject : RBT **Semester : 3rd** **3 - -**
Lesson plan Duration : AUG-NOV

Week	Lecture Day	THEORY TOPIC (including Assignments / Seeminar / Group Discussion / Sessional Tests)	Delivery Date of Lecture		Whether the Lesson Plan Followed ?
			Expected	Actual	Yes / No
1st	1st	**PART – A: RAILWAYS** **UNIT – I** 1.1 Introduction to Indian Railways			
	2nd	1.2 Advantages of Railways: Political, Social, Economic and Techno-Economic Advantages.			
	3rd	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried and Maximum Permissible Speed on the routes.			
2nd	4th	1.4 Railway surveys: Traffic surveys, Reconnaissance survey, Preliminary Survey and Detailed Survey.			
	5th	1.5 Permanent Way: Requirement of an ideal permanent way, Capacity of railway track, Gauges in railway track – Broad, Meter and Narrow Gauges, Selection and Uniformity of gauges, Conning of wheels.			
	6th	1.6 Subgrade and Embankment for Railway Tracks: Functions of subgrade, Subgrade materials and its improvement - use of geo-synthetics, Slopes of embankment their protection, Stability of embankment – Control of erosion, Toe Wall			
3rd	7th	1.7 Track Alignment: Basic requirements of good alignment, Factors influencing the track alignment.			
	8th	1.8 Geometric Design of the Railway Track: Necessity of geometric design of a railway track, Gradient and Grade compensation, Speed of the train, Degree of curve, Super-elevation and Negative super-elevation. (Simple Numerical Problems)			
	9th	**UNIT – II** 2.1 Construction of Track: Earth work - formation and consolidation, Plate laying – laying of a railway track, laying of ballast on the track.			
4th	10th	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.			
	11th	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment, Maintenance of gauge, Maintenance of proper drainage, maintenance of sleepers.			
	12th	**Assignment – 1 / Group discussion / Technical Quiz / Seminar**			
5th	13th	**Sessional Test - 1**			
	14th	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails, Bull Headed Rails, Flat Footed Rails, Selection of rails, Length of rails.			
	15th	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast, Size and section of ballast, Quantity of ballast.			
6th	16th	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete Sleepers.			
	17th	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station, Platforms – Passenger and Goods platforms.			
	18th	**PART – B: BRIDGES** **UNIT-III** 3.1 Bridges: Definition and Basic forms, Components of a bridge, Difference between a bridge and a culvert, Classifications of bridges (only names), Importance of bridges, Standard specifications.			
7th	19th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway, Economical Span, Location of Piers and Abutments, Vertical clearance above highest flood level, Scour Depth. Factors influencing the choice of the bridge type and its basic features.			
	20th	3.3 Bridge Foundations: Well foundations – Components and Sinking of wells, Pneumatic Caissons, Cofferdams for bridge piers, Box Caissons.			
	21st	3.4 Bridge Substructure: Pier and Abutment Caps, Materials for Piers and Abutments, Pier – Loads and Forces to be considered in the design of piers, Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments, Wing walls – Straight, Splayed, Return and Curved wing walls.			
	22nd	**UNIT-IV** 4.1 Reinforced Concrete Bridges:			

8th	23rd	4.1.1 Slab bridges – Components of a slab bridge, Number and spacing of main girders, Cross beams.			
	24th	4.1.2 Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame Bridges.			
9th	25th	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast segments, Connection at mid-span, Advantages.			
	26th	**Assignment – 2 / Group discussion / Technical Quiz / Seminar**			
	27th	**Sessional Test – 2**			
10th	28th	4.3 Construction of Bridges: Incremental Push Launching Method			
	29th	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing.			
	30th	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.			
11th	31st	**PART - III: TUNNELS** **UNIT-V** 5.1 Necessity, Advantages and Classifications of tunnels, Size and shape of tunnel, Site investigation for tunnels, Geotechnical considerations of tunneling.			
	32nd	5.2 Alignment of tunnel, Portals and shafts, Bored Tunnel method of Tunnel Construction			
	33rd	5.3 Typical section of tunnels for a national highway.			
12th	34th	5.4 Typical section of tunnels for single and double broad gauge railway track.			
	35th	5.5 Ventilation – Necessity and methods of ventilation: by blowing, exhaust and combination of blowing and exhaust, Dust control in tunnels.			
	36th	5.6 Drainage method of draining water from tunnels.			
13th	37th	5.7 Lighting of tunnels.			
	38th	5.8 Uses of geo-synthetics in tunnels.			
	39th	**Assignment – 2 / Group discussion / Technical Quiz / Seminar**			
14th	40th	Revision			
	41st	Revision			
	42nd	Revision			
15th	43rd	Revision			
	44th	Revision			
	45th	**Sessional Test-3**			