Lesson Plan of Highway Engineering 4th sem 2022-2023

Period	Unit	Topic
1	Introduction	Importance of highway transportatio: importnce organizations like Indian Road Congress, Ministry of Surface Transport, Central Road Research Institute.
2		Functions of Indian Roads Congress and other organizations.
3		Classification of Roads according to Indian Road of Congress
4		Organisation of state highway department
5		Revision of class and question answer session
6	Road Geometrics	Introduction to road geomtrics and their importance and factors affecting geometric design
7		Various termilogy of road geometrics and their importance.
8		Grossary of terms used in geometric like suface properties of pavment, right of way, formation width, road shoulder.
9		Carriage way, Side slopes, kerbs, formation level, Camber and Gradient
10		Cross section of road, Design speed and average running speed.
11		Type of sight distance, stopping sight distance and its analysis
12		Numerical on stopping sight distance
13		Passing or Overtaking sight distance and its analysis
14		Numerical on passing or overtaking sight distance
15		Necessity of curves, horizontal and vertical curves including transition curve
16		Superelevation and its analysis
17		Design of superelevation and numerical
18		Numericals of superelevation
19		Methods of providing superelevation
20		Numericals on design and running speed
21		Analysis on horizontal curves
22		Analysis on vertical curves
23		Revision of class and question answer session
24		Problem discussion on SSD and OSD
25		Problem discussion on Super elevation and design speed
26	Road Materials	Different types of materials in use: soil, aggregate and binders
27		Functions of soil as highway subgrade
28		California Bearing Ratio(CBR) : methods of finding CBR valued in the laboratory and at site
29		Concept of stress Strain diagram of concrete and steel
30		Singificance and analysis graphs of CBR

31		Testing aggregates: Abrasion test, impact test
32		Testing aggregates: crushing strenght test, water absorption test and soundness
33	Road pavements	Road pavement: Flexible and rigid pavement, their merits and demerits
34		Typical cross-sections, functions of various components
35		Subgrade preparation: setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, compaction.
36		Subgrade preparation: Methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
37		Sub base course preparation: Necessity of sub base, purpose of stabilization.
38		Types of stabilization: Mechanical Stabilization, Lime stabilization, cement stabilization and fly ash stabilization
39		Base Course: Preparation of base course, brick soling, stone soling and metalling, Water Bound Macadam and Wet-mix Macadam
40		Bituminous constructions: Different types Surfacing: Surfacr dressing; premix carpet and semidense carpet
41		Bitumicous concrete, Grouting
42		Rigid pavements: Concept of concrete roads as per IRC specifications
43		Rigid pavements: Different Joints on rigid pavements
44		Rigid pavements: Different Joints on rigid pavements
45		Revision of class and question answer session
46	Hill Roads	Introduction to hill road
47		Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
48		Breast wall and Retaining wall
49		Differentiate between Breast wall and Retaining wall
50		Different types of bend
51		Differentiate between types of bend
52		Revision of class and question answer session
53	Road Drainage	Necessity of road drainage work, cross drainage works
54		Surface Drainage system
55		Sub-surface drainage system
56		Location, spacing and typical details of side drains
57		Side ditches for surface drainage, intersecting drains
58		Pipe drains in in hill roads

59		Details of drains in cutting embankment, typical cross section and question answer session
60	Road Maintenance	Common types of road failures-their causes
61		Common types of road failures-their remedies
62		Maintenance of bituminous road such as patch work and resurfacing
63		Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm)
64		Maintenance of traffic control devices
65		Basic concept of traffic study, Traffic safety and traffic control signal
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67	Construction equipments	Introduction
68		Hot mixing plant
69		Tipper, tractors (wheel and crawler) scraper,
70		Bulldozer, dumpers, shovels, graders, roller dragline
71		Asphalt mixer and tar boilers
72		Road pavers
73		Modern construction equipments for roads.
74	Revision Classes	Revision Classes
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