

REVISED SYNOPSIS, SESSION PLAN & SYLLABUS OF IRSEE BATCH PROBATIONARS - PHASE - I
(Total 8 Weeks = 160 Sessions)

w.e.f.IRSEE-2017 Batch

03.07.2018

FACULTY DESIGN. With NAME (S/Shri)	SUBJECTS & TOPICS	Nos. of Sessions				
		Classroom	LAB	Sub.Exam.	Outside Visits	TOTAL
P/Loco (NMR) (TRS-Conv.Loco)	<u>Traction Rolling Stock (Maintenance) - Conventional Locomotives -</u> 1.Organizational Structure & Types of Locomotives. (Conventional & 3 Phase Locomotives). 2. Power, Auxiliary & Brake Circuit (IRAVB2) of AC Locos (Conventional). 3. Control Circuit including DJ & SMGR Circuit. 4. Loco Equipments at roof, body, cabs & under-frame, in details. 5. Bogie Suspension System and Drives including 3 Phase Loco. 6. General Working of Electric Loco Shed including 3 Phase Loco & EMU Car Shed. 7. Various Maintenance Schedules viz. IA, IB, IC, AOH & IOH. 8. Eequential Procedure for charging the conventional locos.	13	3	1	4	25
AP/PSTC (NDT) (Conv.EMU/MEMU)	<u>EMU/MEMU (Conventional) -</u> 1. Introduction of Conventional EMU/MEMU. 2. Power, Auxiliary Circuit and Brake System of AC EMU/MEMU.	4	0	0	0	
** Exam. for 50 Marks will be taken for TRS(Maintenance)-Conventional Loco & Conventional EMU/MEMU Visit will be planned in Groups of Conv.Loco & 3 Phase Loco AND EMU/MEMU(Conv. & 3 PH)						
SP/A (SND) (TRS-3 PH Loco)	<u>Traction Rolling Stock (Maintenance) - 3 Phase Locomotives-</u> 1. Introduction & types of 3 Phase Locomotives. 2. Power, Auxiliary & Brake Circuit (E70 & CCB) of 3 Phase AC Locos. 3. Loco Equipments at roof, body, cabs & under-frame, in detail. 4. Various Maintenance Schedules of IA, IB, IC, AOH & IOH for 3 Phase Locomotives. 5. Power & Auxiliary Circuit of AC 3 Phase EMUs.	9	3	0	4	16
P/Electronics (HKS) (Electronics)	<u>Electronics -</u> 1. Basic Electronics, PN Junctions, Semiconductor Devices. 2. Resistors, Power Diode, Power Transistors, BJT, MOSFET. 3. Thyristors, GTO and IGBT. 4. Rectifiers, Converters, Inverters, Choppers. 5. PWM and Firing Control Circuits. 6. Electric Drives (DC Drives and AC Drives) and VVVF Control of Induction Motors. 7. Sensors and Transducers, Resonance and Filters.	7	3	1	0	11
** Exam. for 50 Marks will be taken for TRS(Maintenance)-3 Phase Loco & Electronics Visit will be planned in Groups of Conv.Loco & 3 Phase Loco AND EMU/MEMU(Conv. & 3 PH)						

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Lecturer (CMR) (Traction Operation)	<u>Traction Rolling Stock (Operations) -</u> 1. Organizational Structure & Duties of Persons in TRO Org. 2. Manpower & Motive Power Planning - Crew Link & Loco Link for Coaching. 3. Crew Management - Training, Monitoring and Counseling of Drivers. Safety Category, Road Learning, Personal Stores, Downloading of ESMON Data. 4. Rest & Mileage Rules, HOER & Steps to reduce over hours of working. 5. CMS & FOIS. 6. Safety, G & SR pertaining to Loco & Running Staff. 7. Trip Shed Activities & Management & Statistical Data, Statement 4-A. 8. Energy Conservation Measures in TRO. 9. Foot Plate Inspection by TRO Officer. Details of Running Rooms. 10. Miscellaneous Topics (GDR, Paper Line Clear, BPC etc.) 11. Advancement in TRO (New Technologies)	10	0	1	0	11
** Exam. for 50 Marks will be taken for TRS(Operations)						
P/Traction (VMF) (Traction Distribution)	<u>Traction Distribution -</u> 1. Need, benefits & justification of Railway Electrification. 2. Organizational Structure and Duties of Officers & Staff. 3. Basic Principles of OHE Designs. 4. Sectioning Principles of OHE. 5. Description of Over Head Equipments in detail. 6. Description of Power Supply Installations, in detail. 7. Description of Supervisory Remote Control (SCADA) in detail. 8. Various Bonds & SOD. 9. Working of TPC, Maintenance Depot & Tower-Wagon in detail. 10. Types of Foundations, Structures, Cantilevers & Jumpers.	13	3	1	4	21
** Exam. for 50 Marks will be taken for Traction Distribution(TRD)						
SP/GS (HRK) (TL&AC-LHB)	<u>TL & AC - LHB Coaches -</u> 1. Organizational Structure & Duties and 2. Introduction to various systems of Train Lighting system. 3. End-on-Generation. 4. Head-on-Generation. 5. Types of Coaches, Coach Wiring, Lighting and Fans. 6. Maintenance Schedules (Depot Schedule and Shop Schedule) of Primary & Secondary Maintenance & Round Trip Insp. 7. Rake Links, Requirement of Coaches and Manpower Ratio. 8. Fundamentals of Air Conditioning. 9. Air Conditioning Systems, Heat Load Calculation and 10. Power Cars & Pantry Cars, Mini/Sub Pantry Equipments. 11. Pre-Cooling Rest and Pull Down Test and 12. Commissioning Test.	8	3	1	4	16

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P/Electronics (HKS) (TL&AC-ICF)	TL & AC - ICF Coaches - 1. Introduction to Various Systems of Train Lighting. 2. Drive-System & Belts, Alternators & Regulators. 3. Batteries, Different Types & Maintenance. 4. Types of Coaches, Coach Wiring, Lighting and Fans. 5. Maintenance Schedule i.e. Trip, Monthly, Quarterly, IOH, POH and 6. Maintenance Schedules of Primary & Secondary Maintenance. 7. Fundamentals of Air Conditioning, Definition of Different Term and 8. Air Conditioning Systems on Coaches, Heat Load Calculation. 9. Commissioning Test.	6	3	0	0	9
** Exam. for 50 Marks will be taken for TL&AC - LHB Coaches and TL&AC - ICF Coaches Visit will be planned in Groups of TL&AC-LHB or ICF Coaches AND General Service						
SP/GS (HRK) (Gen.Services)	General Services - 1. Organizational Structure. 2. Power Supply Systems, Substation Equipments & Maintenance, Power Factor Improvement. 3. General Concepts of Earthing, Earth Resistance Calculation. 4. Essentials of Good Lighting & Energy Conservation in Lighting, Pumps, Motors etc. 5. Water Supply Pumping Installations, Automation of Pumps, Lighting, Air Conditioners etc. 6. Window/Package AC Units, Central Air Conditioning Plants, Cooling Towers, Water Heaters, Water Coolers and Refrigerators. 7. Lifts & Escalators including their maintenance. 8. Maintenance Schedules and Practices for Sub-Stations, Service Buildings, Transformers, CBs, Isolators, Fuses etc. 9. Tariff, Billing, Maximum Demand, Load Factor, Diversity Factor etc.	8	3	1	4	16
** Exam. for 50 Marks will be taken for General Services Visit will be planned in Groups of TL&AC-LHB or ICF Coaches AND General Service						
SP/M (AKM) (Condition Monitoring)	Non Distructive Tests - 1. Condition Monitoring of Elect. Equipments - Basic Concepts. 2. Diagnostic Testing of Insulation - IR, PI, DAR, SV, DD, RV & Motors. 3. Tan Delta & Capacitance Measurement. 4. Condition Monitoring of Insulating Oil. 5. Hipot test, Surge Comparison Test & Partial Discharge Test. 6. Condition Monitoring of Transformers, Cable & Motors. 7. Acceptance, Routine & Type Test on Major Equipments.	6	4	1	0	11

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SP/M (AKM) (Material Science)	Material Science - 1. Metals, Polymers, Ceramics & Composites and 2. Lubricants & Paints - Specifications, Properties and Selection. 3. Rubber Components - Specification, Storage & Testing and 4. Electrolytic Copper - Case Studies of Failure of Catenary/Contact. 5. Composites - Types, Properties & Application in Railways and 6. Ceramics - Types, Properties & Application in Railways and 7. Mechanical Properties & Testing- For Tensile Strength, Hardness etc.	3	2	0	0	5
** Exam. for 50 Marks will be taken for Condition Monitoring and Material Science						
SP/PO (ATD) (Gen.Topics)	General Topics - 1. Introduction and outline. 2. Brief about Field Training. 3. Project allotment and discussion. 4. Miscellaneous issues.	4	0	0	0	4
YOGA CLASSES	Bi-Weekly One Class will be planned for Yoga	0	4	0	0	4
LIBRARY	Library Sessions for issuing of Books and miscellaneous issues.	0	2	0	0	2
GRAND TOTAL OF SESSIONS INCLUDING EXAM.		91	33	7	20	151

NOTE :- Existing Phase-I of 9 Weeks will be reduced by 1 Week in Rev.78 Weeks Trg.Schedule.