Bangladesh Railway Training Academy
Halishahar, Chattogram.

Sub: Syllabus for Probationer SAE (Signal & Telecom)- Final Course

Signal and Telecommunication Engineer Department

Duration : 6 (Six) Weeks

Full Marks-200

Railway Signal Engineer- Part 1; (Marks-100)

1)G & S Rule : Chapter (I) Preliminary, Chapter (II) Signaling & Interlocking Chapter (III), (Rule- 89,90-144), Chapter (IV) Accident, Chapter (IX), Chapter (X), Chapter (XI), Chapter (XIV), Chapter (XVI).

2) History of Railway Signaling.

3) Signal Engineering Manual : Chapter-2- Section B, Section C, Section D, Section E Chapter III, Chapter IV, Chapter V, Chapter VI, Chapter VII, Chapter IX, Chapter X, Chapter XI, Chapter XII, Chapter XV, Annexure.

4) Signal:- What is signal, Types of signal, non-interlock signal, standard dimensions for signaling, Semaphore arm and color light signal, operation of semaphore signal and color light signal, Interlock signal, Mechanical upper quadrant and lower quadrant signal, Interlocked color light signal, two aspect and multi aspect signal, Main signal, Subsidiary signal, Shunt signal, Warner signal, repeater signal, Signal repeater, Co-acting signal.

5) Interlocking :- What is interlocking, Types of interlocking, Principle of interlocking, Standard of interlocking, requirement of different standard of interlocking.

6) Classification of stations, Block overlap, signal over lap, Breaking distance, sectional capacity.

7) Track Circuit, DC track circuit & Layout, AC track circuit, Audio frequency track circuit, Safe pickup voltage, Drop way voltage, Ballast resistance ,Axle Counter.

8) LC Gate, Classification of level crossing gate, equipment of LC gate, approach warning system at interlocked level crossing gate.

9) Relay Interlocking system (Types of relay : Track relay, Neutral line relay, Line relay, Latching relay, Lamp proving relay, Magnetic contact relay).

10) Route setting, Route release, Route Cancellation, route locking test.

11) Engineering yard diagram, working rule, working rule diagram.

12) Installation of signal & interlocking equipment at station, Determination of minimum equipment of signals and interlocking at different types of station.

13) Block Communication (Block working, absolute block system, Tablet token system, Token less block system).

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বাংলাদেশ রেলওয়ে, সিআরবি, চট্টগ্রাম।

14) Maintenance of different gears & equipment of signaling & Interlocking.

15) Train Control, levels of train control, Modern Train control system (ERTMS, ETCS, AWACS, TPWS, PTC).

16) Electrical point machine, principle of operation & maintenance of point machine.

17) Cables : Signaling cable, Cable laying, Cable distribution plan, Cable core analysis, cable testing.

18) Power System: (a) Power supply system (Commercial Power, Battery Backup, Diesel generator).

(b) Power supply design and Load calculation

(c) Calculation of Capacity of back up battery, Types of battery.

19) Conversion system : (a) Input panel, (b) IPS, UPS, Charger, Inverter, Converter (c) Distribution system.

20) Lighting arrestor and other safety equipment; RAMS; SIL4, fail safety system.

21) CBI system: Redundancy hot stand by, Warm stand by system, Route control chart/control table for standard I, II, III interlocking.

22) CTC system (Station & Central), server of CTC, Train ID movement.

23) CBI software installation /re-installation.

24) VDU software installation /re-installation.

25) CBI (ATO, ATP, ATS, CBTC).

26) Inspection of station & Accident inquiry.

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Telecommunication Engineer - Part 2: (Marks-100)
(TELECOM)

1) Railway telecommunication overview.

2) What is optical fiber cables (OFC), Classification of OFC, Losses of OFC, attenuation of OFC, practical application of OFC,

3) OFC laying method, OFC termination, ODF & OFC link testing equipment & procedure.

4) Principle of transmission through OFC & optical fiber cable splicing.

5) TC (Train control), STS (station to station) phones with block diagram & principle of operation, M Centrex Phone.

6) Router, Media converter, Power over Ethernet switch, power supply equipment & other networking device.

7) IP addressing, several classes of network and sub netting.

8) OSI ; Several Layers of OSI.

9) Back up link of Telecommunication system.

10) FDM, TDM, WDM, PDH, SDH, GSM, CDMA, MODEM, PCM, LAN.

11) TCP/IP ; IP Phone with working principle.

12) Several Telecommunication testing & safety equipment's.

13) BR webmail system, BR website, video conferencing system.

14) TIDS, TTMS, Internet , Intranet.

15) Wireless communication: VHF/UHF transmission method, base station, repeater station, WT (Walki-Talki).

16) PA system at station & train, Importance of PA system, Principle of Block diagram of PA system.

17) CCTV system.

18) Radio repeater, working principle of radio repeater.

19) T & T, GPON, IP PABX exchange.

20) Intercity train Manual: (Chapter- 1, Chapter -4, Chapter- 7, Annexure 8.1, 8.2, 8.3, 12.1, 12.2, 12.3, 26.1, 26.2,26.3, 27.1, 27.2, 27.3, 27.4, 27.5, 27.6, 27.7, 34.1, 34.2, 34.3, 34.4, 34.5, 34.6, 34.7, 34.8, 34.9, 34.10)

27/8/2023

(সুবীর কুমার হালদার)
সহকারী সম্পাদক ও টেলিযোগাযোগ প্রকৌশলী (পূর্ব)
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