

OFFICE OF THE INSPECTOR GENERAL OF POLICE RAJASTHAN, JAIPUR

STANDING ORDER NO..... ✓ 126 58

Dated the 6<sup>th</sup> January, 1968

In exercise of the powers conferred by Rule 26(1) of the Rajasthan Police Subordinate Service Rules, 1966, and in supersession of the standing order No. 11 dated 18th August, 1966, the Inspector General of Police Rajasthan, Jaipur hereby prescribes the following syllabi for the qualifying examinations for selection for Promotion Cadre Courses for the posts of A.S.Is (Radio) & Inspectors of Police (Radio) and qualifying examination for selection for promotion to the rank of S.Is (Radio) and S.Is (Supervisors Radio).

2. The qualifying examinations shall carry 200 marks. Details of the syllabi of examinations shall be as given in Appendix 'A', 'B' & 'C' & 'D'.

3. The Committee nominated by the I.G. of Police shall prepare list of officers for undergoing Promotion Cadre Course as provided in Rule 23 & 24 of the Rajasthan Police Subordinate Service Rules 1966. Details of the syllabi for Promotion Cadre Course shall be as given in Appendix 'E' & 'F'.

4. The Committee shall fix the date and places of the examination. They shall conduct the examination and declare results.

*E. B. B. B. W.*  
Inspector General of Police  
Rajasthan, Jaipur

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APPENDIX 'A'

Syllabus for the qualifying examination of Constables & Head Constables for selection for Promotion Cadre Course for promotion to the rank of A.S.Is(Radio) Operators.

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- A. Written Test ..... 50 Marks
- B. Practical & Outdoor ..... 50 Marks
- C. Interview & Record ..... 100 Marks

A. Written Test :

- (a) Mathematics: Addition, subtraction, multiplication and division of algebraic function, Vulgar & Decimal fractions. Square and square roots. Simple ratio and proportion. Straight line graph.
- (b) Radio Theory: Magnetism and properties of magnets, Ohm's law, series & parallel connections.
- (c) Radio Procedure.

B. Practicals & Outdoor :

- (a) Must be able to know the maintenance of the W/T equipment of a station.
- (b) Must be able to operate, tune and net two types of receivers and transmitters used in the State Police Radio Organisation.
- (c) Installation of outdoor antennas.

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Syllabus for the qualifying examination of Constables & Head Constables for selection for Promotion Cadre Course for Promotion to the rank of ASIs(Radio) Electricians/Fitters.

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- A. Written Test ..... 50 Marks
- B. Practicals & Outdoor ..... 50 Marks
- C. Interview & Record ..... 100 Marks

A. Written Test:

(a) For Electricians:

- (i) Ohm's law, Conductors, Insulators, Series & Parallel Connections of R, L & C.
- (ii) Measurements of voltages and current in a circuit.
- (iii) Magnetism & its properties, Electro-magnets and properties, Electro-magnetic induction.

(b) For Fitters:

Elementary principals of the working of Petrol Engines.

B. Practicals & Outdoor

(a) For Electricians:

Repairs of Electric bells, fans, dynameters & Meters. Winding of Transformers and Armatures & outdoor repairs.

(b) For fitters:

Repairs of charging engines used in the State Police Radio Organisation & outdoor repairs.  
Use of tools & their names.

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APPENDIX 'B'

Syllabus for the qualifying examination of A.S.Is Radioopers. for selection for promotion to the rank of S.Is(Radio) Opers.

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- A. Written Test ..... 50 Marks
- B. Practicals & Outdoor ..... 50 Marks
- C. Interview & Record ..... 100 Marks

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A. Written Test:

(i) Radio Theory:

Ohm's law, Law regarding series & parallel connections of resistances, inductors and condensers.  
 Knowledge of electro-magnets and electro-magnetic induction.  
 Types of power supplies, primary and secondary cells, charging of accumulators and their maintenance.  
 Elementary knowledge of thermionic valves, diodes, triodes, oscillators, detectors and modulators.  
 Principles of working of telephones, microphones, loudspeakers, block & schematic diagrams of transreceivers.  
 Elementary knowledge of wave propagation, propagation on the medium & high frequencies, types of aerials and their design.

(ii) Radio Procedure

B. Practicals & Outdoor

- (i) Must be able to operate and tune and net all the receivers & transmitters used in the Police Radio Organisation and should be able to locate external faults.
- (ii) Installation of outdoor antennas and outdoor station.

Syllabus for the qualifying examination of A.S.Is Radio (Elects.) for selection for promotion to the rank of S.Is Radio Technicians.

A. Written Test	... 50 Marks
B. Practicals & Outdoor	... 50 Marks
C. Interview & Record	... 100 Marks

A. Written Test

- (i) Radio symbols, sound waves and their propagation, speech and musical sounds, pitch, timber, quality of sound.
- (ii) Static Electricity, Current electricity, E.M.F., sources of E.M.F., conductors, insulators, insulation, resistance and its breakdown.
- (iii) Units of current and voltage, Ohm's law, Kirchoff's law, law of series and parallel circuits, batteries, primary and secondary batteries, the lead acid batteries & their charging.
- (iv) Faraday's laws of electro-magnetic induction, direction of induced current, Lenz's law, Faraday's left hand rules. A.C. & D.C. Generators, Eddy currents, Inductances and condensers, theory of their working, their use in radio circuits.
- (v) Alternating current circuits, the effect of resistance and condensers in A.C. circuits, lagging & leading effect in A.C. circuit.
- (vi) Modulation, types of modulation, depth of modulation, modulation index, carrier and side bands in various types of modulations.
- (vii) Valve constants, tube characteristics, constructional features of valves.
- (viii) Receivers, the study of various stages of receivers, the R.F., the Mixer, the I.F., the second detector, the A.F. in a communication receiver.
- (ix) Study of various types of power supply used in transmitters and receivers.
- (x) Propagation & aerial system.

B. Practicals & Outdoor

Must be able to repair all types of receivers and transmitters (upto 75 watts) used in the State Police Radio Organisation and outdoor repairs on antennas and sets.

APPENDIX 'C'

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Syllabus for the qualifying examination of S.I Radio operators /Technicians for selection for promotion to the rank of S.Is(Radio) Supervisors operational/Technical.

FOR S.Is Radio Operators

- A. Written Test ... 50 Marks
- B. Practicals & Outdoor ... 50 Marks
- C. Interview & Record ...100 Marks

A. Written Test:

Radio Theory

- (i) Types of power supplies, accumulators, series & parallel connections of accumulators, charging of accumulators, their maintenance. Preparation of electrolyte, defects in secondary batteries, secondary cells and their remedies.
- (ii) Basic theory of thermionic valves, diodes, triodes, tetrodes, pentodes, amplification factor, variable mu type of valves, gas filled tubes, oscillators, amplifiers, detectors, modulator telephones, types of microphones, loudspeakers, headphones, block diagrams of transmitters and receivers, types of modulations and rectification, schematic diagrams, A.V.C & delayed A.V.C., keying and methods of keying, Class A, B, C amplifiers and their uses, diagrams of various stages of receivers, difference between superhet and straight receivers, voltage doubler, phase inverter, Neutralisation, B.F.O., Hartley & Colpitt Oscillators.
- (iii) Knowledge of propagation of radio waves, skip distance, ground and sky waves, Critical angles and critical frequency, design of various types of aerials used State Police Radio Organisation. Ionosphere and its effect on H.F. & V.H.F. communication. Various types of feeders and their design.

Radio Procedure

B. Practicals & Outdoor

- (i) Must be able to receive 13 standard messages in 15 mts with an accuracy of 99% with QRM 3. Must be able to send 13 standard messages in 15 minutes with an accuracy of 99% with no uncorrected errors, the corrected errors not exceeding 7.
- (ii) Must be able to rectify faults of the transmitters and receivers used in the State Police Radio Organisation.

FOR S.Is RADIO TECHNICIANS

- A. Written Test ... 50 Marks
- B. Practicals & Outdoor ... 50 Marks
- C. Record & Interview ...100 Marks

A. Written Test

- (i) A.C. Circuits, concept of alternating current, voltage and frequency. Expression of frequency in radian per second. Phase difference, power in A.C. circuits, power factor. Solution of simple series and parallel A.C. circuits. Series and parallel resonance circuits, Q of coil, non-sinusoidal waveform, its composition.
- (ii) Electron tubes, their characteristics and parameters, Miller effect, transit time effect, inter-electrode capacitance.
- (iii) Oscillators, types of oscillators, conditions of oscillations.
- (iv) Modulation, types of modulation and methods of generation of modulated wave.

- (v) Transmission lines and aerials.
- (vi) Propagation of H.F and V.H.F. waves.

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B. Practicals & Outdoor

- (i) Repairs of all types of transmitters and receivers used in the State Police Radio Organisation and outdoor ~~antennas~~ repairs of sets and antennas.
- (ii) Minor repairs of AVO meters and other meters used in the State Police Radio Organisation.

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APPENDIX 'D'

Qualifying examination of S.Is Radio Supervisors (Operational/ Technical) for selection for promotion cadre course for promotion to the rank of Inspector (Radio).

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FOR S.Is Supervisors (Operational/Technical)

A. Written Test	.... 50 Marks
B. Practicals & Outdoor	.... 50 Marks
C. Interview & Record	.... 100 Marks

A. Written Test:

Radio Theory

- (i) A.C. theory, A.C. Circuits, acceptor and rejector circuits, expression of frequency in radian, phase difference & vectors, power factors, single phase and poly phase circuits.
- (ii) A, B, C amplifiers, types of couplings and their design.
- (iii) Negative feedback, voltage and current feedback (balanced feedback)
- (iv) Modulation, A.M. & F.M., low level and high level modulations, Reactance tube and balanced modulation. Single side band, its advantages and disadvantages.
- (v) F.M. Receivers, Squelch limiter and discriminators.
- (vi) Transmission lines and aerials.
- (vii) Propagation of H.F. and V.H.F. waves.
- (viii) Special circuits, Q.A.V.C, ANL, D.A.V.C, A.M.C, F.S.K., Phase shift oscillator, vacuum tube keyers.

B. Practicals & Outdoor :

(a) For S.Is Supervisors (Technical)

- (i) Design of tank circuits, Inductor of High & Low 'Q'.
- Power supplies, Oscillators.
- (ii) Measurement of output power of the transmitters. Depth of modulation, Fidelity, Sensitivity and selectivity of receivers, use of oscillograph. Outdoor measurements of field strength of transmitters and radiation pattern of aerials.

(b) For S.I. Radio Supervisors (Operational)

- (i) Must be able to rectify three given faults in any transmitter and receiver used in the State Police Radio Organisation. Outdoor installation of sets & measurements of field strength of transmitters.
- (ii) Must be able to tune any transmitter upto 400 watts used in the State Police Radio Organisation.

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APPENDIX 'E'

Syllabus for promotion cadre course of Constables & Head constables for promotion to the rank of ASIs(Radio)

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FOR ASI(Radio) Operators

- A. Written Test ..... 80 Marks
- B. Practicals & Outdoor ..... 50 Marks
- C. Elementary Knowledge of Police Act ... 20 Marks

A. Written Test

- (i) Mathematics: Addition, subtraction, multiplication, and division of algebraic function, Vulgar and decimal fractions. Square and square roots. Simple ratio and proportion. Straight line graph.
- (ii) Radio Theory: Magnetism & properties of magnets. Ohm's law series and parallel connections.
- (iii) Radio Procedure.

B. Practicals & Outdoor

- (i) Must be able to receive and send 10 standard messages in 15 minutes with an accuracy of 97.5%.
- (ii) Must be able to operate and tune and net any two types of receivers and transmitters used in the State Police Radio Organisation. Installation of outdoor antennas.

C. Elementary knowledge of Police Act

- 1. Police Act, 1861
- 2. Powers under C.R.P.C.

FOR ASIS (Radio) Electr./Fitters

A. Written Test

Theory

- (i) Fundamental principles of working of internal combustion engines, description of the parts of the petrol engines and their use. OR
- (ii) Knowledge of wiring regulations, use of electrical instruments like ammeters, voltmeters and service meters. Armature and transformer winding. OR
- (iii) Principles of working of secondary batteries, their maintenance and initial charging, knowledge of repairs of batteries

B. Practicals & Outdoor

- (i) Repairs of any part of petrol generator, diagnosis of engine troubles and its cure, fault tracing and outdoor repairs.
- (ii) Wiring of transformers and armatures, removal of faults in the electric circuits indoor/outdoor. Repairs of fans, electric bells, dynamometers and meters and outdoor repairs.

C. Elementary knowledge of Police Act:

- (1) Police Act, 1861
- (2) Powers under C.R.P.C.

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APPENDIX 'F'

Syllabus for promotion cadre course of S.Is Radio (Supervisors) operational Technical for promotion to the rank of Inspectors Radio

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- A. Written Test ..... 80 Marks
- B. Practicals & Outdoor ..... 50 Marks
- C. Knowledge of Police Rules & Regulations ..... 20 Marks

A. Written Test:

Radio Theory

- (i) Networks: Kirchoff's law, potential dividers, Thevenin's Theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, super position theorem. Four terminal networks, multimesh networks, phase shift networks.
- (ii) A.C. Circuits, concept of alternating current, voltage & frequency, Expression of frequency in radians per second. Phase difference, power in A.C. circuits, power factor. Solution of simple series and A.C. parallel circuits. Series and parallel resonance circuits, Q of a coil, non-sinusoidal wave form and its composition.
- (iii) Electron tubes, their characteristics and parameters, inter electrode capacitance, Miller effect.
- (iv) Oscillators, types of oscillators, conditions of oscillation.
- (v) Modulation, types of modulation and methods of generation of modulated wave.
- (vi) Transmission lines and aerials.
- (vii) Propagation of HF AND VHF waves.
- (viii) F.M. transceivers, testing instruments, test procedure and operating conditions, adjustment & maintenance.

B. Practicals & Outdoor

- (i) Repairs of all types of transmitters & receivers used in the State Police Radio Organisation.
- (ii) Repairs of AVO meters and other meters used in the State Police Radio Organisation. Outdoor measurements of field strength of transmitters & radiation pattern of aerials. Outdoor installation of sets and aerials.

C. Knowledge of Police Rules & Regulations:

- (i) Police Act & Rules.
- (ii) Powers under C.R.P.C.
- (iii) Privileges under R.S.R.
- (iv) G.A. Rules, Elementary knowledge.

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