SYLLABUS AND THE DETAILS OF EXAMINATIONS FOR THE AWARD OF AMATEUR STATION OPERATOR'S CERTIFICATE

1. The examination shall consist of the following two parts:

PART I - Written Test

It shall comprise of one paper containing two sections as under:

Section A: Radio Theory and Practice

Note- Applicants holding degree in telecommunication, or electronics and electrical communications, or a degree recognized by the Central Government as equivalent to the above degree shall be exempted from appearing in Section I of the test.

Section B: National and International Regulations applicable to the operation of amateur station and those relating to the working of station generally.

PART II - Morse

(i) Receiving, and (ii) Sending.

2. Detailed syllabus:

2.1 Amateur Station Operator's Grade II Examination

Part I – Written Test

(a) Section I: Radio Theory and Practice :

Elementary Electricity and Magnetism :
Elementary theory of electricity, conductors and insulators, units, Ohm's Law, resistance in series and parallel conductance, power and energy, permanent magnets and electromagnets and their use in radio work; self and mutual inductance; types of inductors used in receiving and transmitting circuits, capacitance; construction of various types of capacitors and their arrangements in series and/or parallel.

Elementary Theory of Alternating Currents :
Sinusoidal alternating quantities - peak, instantaneous, R.M.S. average values, phase; reactance, impedance; series and parallel circuits containing resistance, inductance, capacitance; power factor, resonance in series and parallel circuits; coupled circuits; transformers for audio and radio frequencies;

Thermonic Valves :
Construction of valves; thermonic emission, characteristic curves, diodes, triodes and multi-electrode valves; use of valves as rectifier, oscillators, amplifiers, detectors and frequency changers, power packs, stabilisation and smoothing, elementary theory and construction of semiconductor devices - diodes and transistors.

Radio Receivers :
Principles and operation of T.R.F. and superhetrodyne receivers, CW reception; receiver characteristics-sensitivity, selectivity, fidelity; adjacent channel and image interference; A.V.C. and squelch/circuits; signal to noise ratio.

Transmitter :
Principles and operation of low power transmitter; crystal oscillators, stability of oscillators.

Radio propagation :
Wave length, frequency, nature and propagations of radio waves; ground and sky waves; skip distance; fading.

Aerials :
Common types of transmitting and receiving aerials.

Frequency Measurement :
Measurement of frequency and use of simple frequency meters.

(b)Section II: Regulations:

(a) Knowledge of

(i) the Indian Wireless Telegraph Rules, 1973.
(ii) the Indian Wireless Telegraphs (Amateur Service) Rules, 1978.
(iii) Knowledge of International Radio Regulations as relating to the operation of amateur stations with particular emphasis on the following :

Item	Provision of Radio Regulation
Designation of Emission ...	104-110
Nomenclature of the Frequency & Wavelength ...	112
Frequency Allocation of Amateur Services ...	Article 5
Measures against interference ...	667-677
Interference and Tests ...	693-703
Identification of Stations ...	735-737 743, 772-773
Distress and Urgency Transmissions ...	1389-1396, 1477-1478, 1481, 1483
Amateur Station ...	1560-1567
Phonetic Alphabets and figure code ...	Appendix 16

(iv) Standard Frequency and Time Signals Services in the World.
(v)The following `Q' codes and abbreviations which shall have the same meaning as assigned to them in the Convention.

QRA, QRG, QRH, QRI, QRK, QRL, QRM, QRN, QRQ, QRS, QRT, QRU, QRV, QRW, QRX, QRZ, QSA, QSB, QSL, QSO, QSU, QSV, QSW, QSX, QSY, QSZ, QTC, QTH, QTR, and QUM.
Abbreviations :
AA, AB, AR, AS, C, CFM, CL, CQ, DE, K, NIL, OK, R, TU, VA, WA, WB.

The above written test is of one hour duration. the maximum number of marks is 100 and candidate must secure at least 40 % in each section and 50% in aggregate for a pass.

Part II – Morse

(a) Section 1 : **Morse Receiving : (Speed : 5 words per minute)**
The test piece will consist of a plain language passage of 125 letters, five letters counting as one word. Candidates are required to receive for five consecutive minutes at the speed of 5 words per minute from a double head-gear headphone receiver, international morse signals from an audio oscillator keyed either manually or automatically. A short practice piece may be sent at the prescribed speed before the start of the actual test. Candidates will not be allowed more than one attempt in each test. The test may be written in ink or pencil but must be legible. Bad handwriting and over-writing will render a candidate liable to disqualification. More than 5 errors will disqualify a candidate.
(b) Secton 2 : Morse Sending (Speed : 5 words per minute)
The test piece will consist of a plain language passage of 125 letters, 5 letters counting as one word. Candidates are required to send on an ordinary key for five consecutive minutes at the minimum speed of five words per minute. A short practice piece may be allowed before the actual test. Candidates will not be allowed more than one attempt in the test. Efforts should be made to correct all errors. However, more than 5 uncorrected errors will disqualify a candidate. The accuracy of signaling, correct formation of characters and the correctness of spacing shall be taken into account.
Note- A candidate is required to pass both in Part I and Part II. In the case of candidates qualifying in Part I only, the license shall be restricted to radiophone operations only.

2.2. Amateur Station Operators' Grade I Examination

Part I - Written Test

Same syllabus as for the Amateur Station Operators Grade II examination. The test is of 2 hours duration. The maximum number of marks is 100 and candidates must secure at least 50% in each section and 55% in aggregate for a pass.

Part II – Morse

(a) Section 1 : Morse Receiving (Speed 12 words per minute)
The test piece will consist of a plain language passage of 300 characters which may comprise of letters, figures and punctuations (Punctuations are indicated below). The average words shall contain five characters and each figure and punctuation will be counted as two characters. Candidates are required to receive for five consecutive minutes at a speed of 12 words per minute. Other conditions are the same as applicable to Amateur Station Operator's Grade II examination.
Note- Test piece may contain only the following punctuations :
Full stop; Comma; Semi-colon; Break Sign; Hypen and question mark.

(b)Section 2 : Morse Sending (Speed 12 words per minute)
The test piece will be similar to Morse Receiving test. Candidates are required to send for five consecutive minutes at a speed not less than 12 words per minute. Other conditions are the same as applicable to Amateur Station Operators' Grade II examination.
Note- A candidate is required to pass both in Part I and Part II simultaneously.

2.3 Advanced Amateur Station Operators' Certificate

Part I - Written Test

(a) Section 1 : Radio Theory and Practice :

In addition to the syllabus prescribed for Amateur Station Operator's Grade II examination, following items shall be included in the syllabus of Advanced Amateur Station Operators' examinations:-
(i) Motors and Generators : Elementary principle and construction of alternators, motors and Generators.
(ii) Alternating current : Constructing of transformers, transformer losses, transformer as a matching device.
(iii) Measuring Instruments : Moving coil and moving iron meters, frequency meters.
(iv) Semi Conductor devices and Transistors : Elementary principles of conduction and construction, symbols biasing methods.
(v) Power Supplies : Half wave and full wave rectifiers, smoothing and regulating, bridge rectifier.
(vi) Modulation: Principles of frequency modulation.
(vii) Transmitters and Receivers : Elementary principles of transmission and reception of Facsimile and Television signals, elementary principles of transmitters and receivers employing single side band.
(viii) Propagation : Characteristics of ionosphere and troposphere. Properties of different reflecting layers, optimum working frequency, day and night frequencies.
(ix) Aerials : Principles of radiation, aerials for different frequency bands including aerials for microwave.
(x) Space Communications : Elementary principles of communication via satellite.

(b) Section 2 : Regulations :

Same syllabus as prescribed for Amateur Station Operators' Grade I examination.

Note- The holders of Amateur Station Operators' Grade I License shall however be exempted from Part II of the examination.