

SYLLABUS OF THE RADIO AMATEUR EXAMINATION

The examination is a PASS examination consisting of a single question paper of three hours duration. Each paper is divided into two parts. Part I contains only two questions, each of them compulsory. These questions will be drawn from items 1 and 2 of the syllabus. Part II consists of eight questions, drawn from the remaining items of the syllabus, of which six only should be attempted.

Candidates are expected to achieve a pass in each of the Parts separately and failure in either Part entails failure in the examination as a whole.

## SYLLABUS -

PART I1. Licensing Conditions

Conditions (terms, provisions and limitations) laid down by the Postmaster General in the Amateur (Sound) Licence, covering the purpose for which the transmitters may be used; types of signals permissible; types of emission; power; frequency control and measurements; avoidance of interference to other stations, particularly in bands shared with other services; qualifications of operators; log keeping and use of call signs.

2. Transmitter Interference

Frequency stability. Avoidance of harmonic radiation and of interference by shock excitation; use of key click filters and other means of preventing spurious emissions. Dangers of over modulation. Devices for reducing interference with nearby radio and television receivers.

PART II3. Elementary Electricity and Magnetism

Elementary theory of electricity; conductors and insulators; units; Ohm's law; resistors in series and parallel. Power; Permanent magnets and electro-magnets and their use in radio work. Primary cells; self and mutual inductance; types of inductors used in receiving and transmitting circuits. Capacitance; construction of various types of capacitors and their arrangement in series and/or parallel.

4. Elementary Alternating Current Theory

Alternating currents and voltages. Alternating current theory incorporating circuits with inductance, capacitance and resistance. Impedance, resonance, coupled circuits, acceptor and rejector circuits. The transformer.

5. Thermionic Valves and Semi-conductors

Characteristics and essential construction of transistors, semi-conductor diodes, thermionic diodes, triodes and multi-electrode valves. Use of semi-conductor devices and valves as oscillators, amplifiers, detectors and frequency-changers. Distortion; harmonics. Push-pull; power rectification: stabilization and smoothing; typical power packs for low-power transmitters and receivers.

## 6. Radio Receivers

Typical receivers; principles and operation of T.R.F. and super-heterodyne receivers. C.W. reception. Interference caused by receivers.

## 7. Low power transmitters

Oscillator circuits; use of quartz crystals to control oscillators. Frequency multipliers, power amplifiers. Methods of keying transmitters. Methods of modulation and types of emission in current use.

## 8. Propagation

Nature and propagation of radio waves. Ionospheric and tropospheric conditions and their effect on propagation. Relationship between wavelength, frequency and velocity of propagation.

## 9. Aerials

Common types of receiving and transmitting aerials. Transmission lines. Directional systems. Aerial couplings to lines and transmitters. Matching.

## 10. Measurements

Measurement of frequency. Operation of simple frequency meters (including crystal controlled types); use of verniers and other interpolation methods. Artificial aerials and their use for lining up transmitters. Measurement of current and voltage at audio and radio frequencies. Measurement of power input to the final stage(s) of a transmitter. Use of cathode-ray oscilloscope for the examination and measurement of waveform.