

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENCY ISSUED  
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(ADVANCED CLASS)

**Licensing Conditions, Operating Practices and Procedures**

*Two hours*

**Index No. ....**

Answer **all** questions on this paper itself.  
Pick out the correct answer and **underline it**.

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1. Operation in accordance with the ITU frequency band plan
  - (a) applies only to HF amateur bands
  - (b) will ensure that operation is always under the optimum propagation condition for any given band
  - (c) will enable the maximum number of amateur communications of all modes of emissions to be accommodated in the Amateur bands.
  - (d) will ensure that no undue interference is caused to the radio services.
  
2. One of the causes of Key Clicks on Amateur Transmission is
  - (a) keying the Oscillator Stage of the Transmitter
  - (b) the DC current causing a spark at the key contacts.
  - (c) using a CW transmitter for the Radio Teletype transmission.
  - (d) too high inductance in series with the key.
  
3. Radiation of harmonics and other spurious emissions shall be suppressed to a level that causes undue or harmful interference with
  - (a) TV transmissions only
  - (b) any other wireless telegraph transmissions
  - (c) any electronic apparatus
  - (d) any other amateur transmission
  
4. Which one of the following levels or peak deviation is suitable for a 25 kHz FM channel spacing system
  - (a) 5kHz
  - (b) 25 kHz
  - (c) 12.5 kHz
  - (d) 16 kHz
  
5. Which one of the following operations constitutes a breach of the conditions of the Amateur Radio Licence ?
  - (a) To operate F3E on 144.35 MHz
  - (b) To operate A1A telegraphy on 14.320 MHz
  - (c) To operate fast scan TV on 1.930 MHz
  - (d) To on pass a message of an amateur very sick to his family
  
6. If a transmission has poor frequency stability
  - (a) 'chirp' will be produced when the transmitter is keyed.
  - (b) the transmission may cause interference to stations operating on multiples of transmitter frequency.
  - (c) the power amplifier stage will be difficult to adjust.
  - (d) the transmission may cause interference to stations sharing the same band.
  
7. Which one of the following must be taken into account out of band operation when working near the band edge?
  - (a) the mode of emission.
  - (b) V.S.W.R. of the transmitter.
  - (c) Bandwidth of the emission and accuracy of measurement
  - (d) Gain of the antenna.

8. Harmonic emissions can arise from
- (a) incorrect matching between stages
  - (b) incorrect tuning of the antenna tuning unit.
  - (c) using a VFO instead of crystal oscillator.
  - (d) over driving the power amplifier.
9. One of the causes of key-clicks on an amateur transmitter is
- (a) too high inductance of the choke used.
  - (b) using a CW transmitter for radio-teletype transmissions.
  - (c) keying the oscillator stage of the transmitter.
  - (d) the dc current causes a spark at the key contacts.
10. The VFO of an HF transmitter should operate from a regulated power supply
- (a) to prevent frequency instability.
  - (b) to prevent key-clicks.
  - (c) to prevent overloading the final stage.
  - (d) to avoid harmonic radiation.
11. The use of properly designed  $\pi$  section between the final amplifier and a low impedance antenna feeder will
- (a) considerably reduce the harmonic content in the output.
  - (b) avoid the need to neutralise the amplifier.
  - (c) prevent parasitic oscillations.
  - (d) improve the power output of the stage.
12. It is necessary to use sound mechanical construction of a VFO in order to reduce the risk of
- (a) spurious radiation
  - (b) poor frequency stability
  - (c) parasitic radiation
  - (d) microphonic
13. Which one of the following types of interstage coupling in a transmitter driver stage will minimise spurious and harmonic radiation ?
- (a) Direct coupling
  - (b) Capacitive coupling
  - (c) Inductive link
  - (d) opto isolator
14. A Television receiver is experiencing interference on sound from a nearby amateur transmitter. With the volume Control fully turned off the break through is still heard. Which stage of the receiver is affected ?
- (a) IF amplifier
  - (b) Audio amplifier
  - (c) Audio detector.
  - (d) R.F. tuner
15. Mains borne interference can be defined as
- (a) mains hum
  - (b) insufficient insulation between main supply and the antenna of a transmitter
  - (c) resonance occurring in the power supply at the transmission frequencies.
  - (d) the escape of r.f. energy from a transmitter via the mains lead.
16. To reduce interference from a 144 MHz transmitter to a TV receiver the aerial socket of the TV receiver should be fitted with
- (a) an attenuator
  - (b) a UHF amplifier
  - (c) a high pass filter
  - (d) a low pass filter
17. An amateur transmitter is causing severe radio frequency patterning with a tendency for some speech breakthrough on all television channels on a nearby television receiver. The television receiver is connected to a Yagi type antenna mounted on a water tank bracket about 15 meters above ground level. There is a soft mounted wideband antenna booster connected to the TV down lead which is giving a gain of 15 dB. All spurious and harmonic radiation from the amateur transmitter is at least 60 dB down on the fundamental transmit frequency. The interference most likely due to
- (a) poor earthing of the transmitter.
  - (b) harmonics of the television local oscillator mixing with the transmitter to produce an intermediate frequency.
  - (c) cross modulation at the television booster input due to signal overloading.
  - (d) audio pickup in the TV loudspeaker leads.

18. A mains transformer may be designed to reduce mains borne interference by using
- (a) an each centre tap on the primary winding.
  - (b) a paper capacitor connected between the primary and secondary windings.
  - (c) a ferrous screen inserted between primary and secondary windings
  - (d) an earthed copper screen between primary and secondary windings.
19. Which of the following has the greatest effect on the total bandwidth occupied by a Morse transmission ?
- (a) transmitter power
  - (b) keying form
  - (c) keying speed
  - (d) type of key used
20. Which one of the following types of spurious signals which can be heard on a receiver arises in the receiver itself ?
- (a) 'chirp'
  - (b) sideband splatter
  - (c) second channel interference
  - (d) parasitic oscillations
21. It is desirable to use a buffer amplifier after an oscillator stage to
- (a) boost the output level of the oscillator
  - (b) multiply the oscillator frequency
  - (c) isolate the oscillator from the other stages
  - (d) prevent spurious oscillations
22. Which of the following tuned circuit will encourage minimum drift in an oscillator
- (a) high Q tuned circuit and heavy loading
  - (b) low Q tuned circuit and heavy loading
  - (c) low Q tuned circuit and high loading
  - (d) high Q tuned circuit and light loading
23. A transmitter operates on a frequency 145 MHz. Interference is caused to a receiver on the VHF broadcast band (88-108 MHz) due to the closed proximity of the transmitting antenna and the relative weak signal strength of broadcasting station. The type of filter that may be used to eliminate the interference is a
- (a) high pass filter in the receiver antenna feeder.
  - (b) low pass filter in the receiver antenna feeder
  - (c) filter in the mains supply leads to the transmitter
  - (d) low pass filter in the transmitter antenna feeder
24. A coil of a few turns wound on a low value carbon resistor and connected closed to the collector connection of a common emitter power amplifier could be used to prevent
- (a) parasitic oscillations
  - (b) interference being induced into the power supply.
  - (c) the radiation of harmonics
  - (d) key clicks
25. The purpose of a two tone test in a SSB transmitter is to
- (a) check the access to a repeater station
  - (b) occupy a free channel before transmission
  - (c) provide station identification
  - (d) check the operation of SSB linear amplifier
26. The bandwidth of a Radio Telephone transmission can be restricted by
- (a) using a speech clipper
  - (b) using a pi filter in the output of the power amplifier stage.
  - (c) using a high Q tuned circuit in the buffer amplifier stage
  - (d) restricting the frequency response of the microphone used.
27. How should a transmitting antenna be positioned relative to a TV antenna
- (a) as far away as possible
  - (b) mounted on the same pole
  - (c) at a distance of 25 meters
  - (d) the elements should be at right angles
28. When attempting to by pass r.f. interference affecting a transistor mounted on a printed circuit board a disc ceramic capacitor would normally be inserted between
- (a) earth and emitter
  - (b) collector and emitter
  - (c) emitter and base
  - (d) base and collector

29. SSB transmissions are picked up on nearby Hi-Fi system when it is being used to play CDs. What would be the Likely cure ?
- Fit a low value by pass capacitor directly across the speaker terminals.
  - Fit a ferrite ring in the centre of the speaker leads.
  - Fit a ferrite ring in the speaker leads as close to the Hi-Fi unit as possible.
  - Fit a ferrite ring in the speaker leads as close to the speakers as possible.
30. When operating under an Amateur license the licensee is permitted to transmit on
- 25 MHz.
  - 30 MHz.
  - 52 MHz.
  - 70.5 MHz.
31. Morse telegraphy by on/off keying without the use of modulating frequency is designated by the symbols
- A1A
  - J3E
  - A2A
  - F3E
32. Radio Telephony using Frequency Modulation is designated by symbols
- A1A
  - J3E
  - A2A
  - F3E
33. Radio Telephony using single side band suppressed carrier is designated by the symbols.
- A1A
  - J3E
  - A2A
  - F3E
34. Radio Telephony using amplitude tone modulated telegraphy is designated by the symbols
- A1A
  - J3E
  - A2A
  - F3E
35. To permit the maximum number of users to operate through a satellite transponder, the preferred method of modulation is
- TV
  - SSB
  - RTTY
  - frequency modulation
36. The purpose of CQ call is to
- indicate that you do not wish to establish communication presently.
  - provide a test transmission for interference checking purpose.
  - indicate to anyone hearing that an emergency is in progress.
  - invite anyone hearing you to establish contact
37. The time in a Log must be given in
- Sri Lanka Standard Time (SLST)
  - Indian Standard Time (IST)
  - Coordinated Universal Time (UTC)
  - Eastern Standard Time (EST)
38. When an Amateur station is operating from a ship in the Pacific Ocean the call sign should be
- 4S7XX/MM/1
  - 4S7XX/MM/2
  - 4S7XX/MM/3
  - 4S7XX/MM
39. When an Amateur station is operating from a ship in the Indian Ocean the call sign should be
- 4S7XX/MM/1
  - 4S7XX/MM/2
  - 4S7XX/MM/3
  - 4S7XX/MM
40. When an Amateur station is operating from a ship in the Atlantic Ocean the call sign should be
- 4S7XX/MM/1
  - 4S7XX/MM/2
  - 4S7XX/MM/3
  - 4S7XX/MM
41. Which Amateur band is allocated for sharing with other services /
- 7-7.1 MHz
  - 3.5-3.9 MHz
  - 14-14.350 MHz
  - 21-21.450 MHz
42. The license may change the main station address
- provided the suffix 'P' is used with the call sign and the location is given to accuracy of at least 5 km by a generally used identifier.
  - only if prior notice is given to the Radio Amateur License unit.
  - provided the ministry of defence is informed about it.
  - provided the suffix 'A' is used with the call sign.

43. What is the frequency separation used on Amateur repeaters on the VHF bands?  
 (a) 5000 kHz. (b) 1000 kHz. (c) 800 kHz. (d) 600 kHz.
44. The tone required to access an Amateur repeater is  
 (a) 1725 Hz. (b) 1750 Hz. (c) 1775 Hz. (d) 1800 Hz.
45. The use of repeater station by base station is  
 (a) should be encouraged (b) is illegal  
 (c) should be discouraged (d) will damage the repeater.
46. A 435 MHz high gain antenna points right into a UHF TV receiving antenna. This could cause  
 (a) melting of the TV antenna elements (b) self oscillation of the 435 MHz transmitter.  
 (c) overloading of the TV front end. (d) problem with the 435 MHz receiver.
47. A multiband antenna  
 (a) is more efficient than the dipole (b) will never radiate harmonics.  
 (c) will radiate harmonics (d) will radiate only the transmitted frequency.
48. In the Q-code who is calling me  
 (a) QRL (b) QRM (c) QRN (d) QRZ
49. The Q-code affected by static is  
 (a) QRL (b) QRM (c) QRN (d) QRZ
50. The Q-code affected by radio interference is  
 (a) QRL (b) QRM (c) QRN (d) QRZ

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**Answers**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. d  | 2. b  | 3. b  | 4. c  | 5. d  |
| 6. a  | 7. c  | 8. d  | 9. d  | 10. a |
| 11. a | 12.   | 13.   | 14. b | 15. a |
| 16. c | 17. c | 18. d | 19. a | 20. d |
| 21. a | 22. d | 23. b | 24. a | 25. d |
| 26. c | 27. a | 28.   | 29. a | 30. c |
| 31. a | 32. d | 33. b | 34. c | 35. c |
| 36. d | 37. c | 38. d | 39. d | 40. d |
| 41. b | 42. d | 43. d | 44. b | 45. a |
| 46. c | 47. d | 48. d | 49. d | 50. b |

No errors in this question paper.