Department of Examinations

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENY ISSUED BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS, SRI LANKA – 2001
(GENERAL CLASS)

Fundamentals of Electricity and Radio Communications

Two hours

*Answer all questions on **this paper** itself.* **Index No:-……..**

*A minimum of 50 marks is required for a pass. Pick out the correct answer and **underline** it.*

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1. The frequency of the 230V main supply is
   (a) 100 Hz (b) 110 Hz (c) 60 Hz (d) 50 Hz

2. Which of the following gives very sensitivity to the temperature change ?
   (a) transistor (b) thermistor (c) inductor (d) capacitor

3. For DC voltage, a capacitor acts as
   (a) short circuit (b) a closed circuit (c) an open circuit (d) a LC circuit

4. AC current can induce voltage because it has
   (a) positive value. (b) negative value.
   (c) varying magnetic field. (d) constant magnetic field.

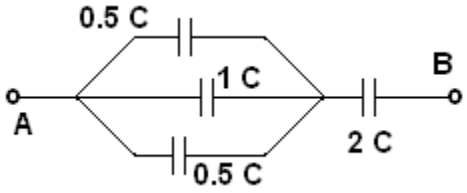
5. Generally full wave rectifying diode bridge consists of
   (a) 04 Nos. diodes (b) 03 Nos. diodes. (c) 02 Nos. diodes. (d) 01 No. diode.

6. By using a CRO we can observe the
   (a) value of a resistor. (b) waveforms.
   (c) value of an inductor. (d) value of a capacitor.

7. Generally with temperature increase, resistance of a conductor will
   (a) increase. (b) decrease. (c) stay constant. (d) be zero.

8. 1.5A current flows through an electric bulb, it has a resistance of 45 Ω. The dissipated energy for 2 Minutes is
   (a) 12.15 J. (b) 121.50 J. (c) 1215 J. (d) 12150 J.

9. The effective capacitance between A and B in the circuit shown is
   (a) 0.5 C (b) 1 C (c) 3C (d) 4 C



10. The power taken by a 3-phase load is given by
    (a) VI (b) 3VI (c) √3 VI (d) √2 VI

11. Frequency range from 300kHz to 3 MHz is
    (a) microwave (b) MF (c) HF (d) VHF

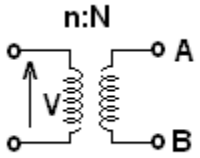
12. Most of the power in an AM signal is in the
    (a) carrier. (b) modulating signal. (c) sidebands. (d) none of these.

13. Class AB amplifier with sinusoidal wave input signal, the output current flows for
    (a) full cycle (b) a half cycle
    (c) less than a half cycle (d) more than a half cycle

14. Frequency translation is d……. with a circuit called a
    (a) closed (b) opened (c) mixer (d) filter

15. Pre-emphasis circuit is use ……
    (a) before modulation (b) after modulation
    (c) before demodulation (d) after demodulation

16. The voltage induced between A and B in the diagram shown is
    (a) nV/N (b) NV/n (c) NV (d) nV



17. The unit of a e-field is
    (a) Ohm (b) Henry (c) Volt (d) Ampere

18. product detector is used for the detection of
    (a) carrier signal (b) SSB and CW signals.
    (c) AM signal (d) FM signal

19. The electric flux and field intensity inside in conducting sphere is
    (a) constant value (b) increasing (c) decreasing (d) zero

20. SWR is measured by means of
    (a) CRO (b) a frequency counter (c) a dip meter (d) a reflectometer

21. The ionosphere cause ……. signals to be
    (a) refracted. (b) rejected. (c) reflected. (d) refused.

22. Which of the following combination forms a high pass filter?
    (a) resistor and…….. (b) capacitors and resistors
    (c) series inductor and shunt capacitor (d) series capacitors and shunt inductor.

23. Power factor is given by
(a) sin φ (b) cos φ (c) tan φ (d) none of the above.

24. The current through a resister
(a) can change suddenly. (b) cannot change suddenly
(c) is always zero. (d) is never zero.

25. A VFO should ide…….followed by a
(a) class A amplifier (b) power amplifier (c) buffer amplifier (d) low pass filter.

26. Geostationary satellites are placed in equatorial orbit at a height of,
(a) 36000 km. (b) 27000 km. (c) 18000 km. (d) 9000 km.

27. A diode bridge is ……converts,
(a) AC to DC (b) analogue to digital
(c) DC to AC (d) digital to analogue.

28. The current that …… taken for a full scale deflection of 1 Volt in a voltmeter quoted as 10 kΩ / V
(a) 5 μA (b) 10 μA (c) 50 μA (d) 100 μA

29. The energy store in a capacitor C is given by ,
(a) $\sqrt{2}\ C^2V$ (b) $\sqrt{2}\ CV^2$ (c) $(1/\sqrt{2})\ CV^2$ (d) $CV^2/2$

30. An ideal diode has an internal resistance, when forward biased
(a) infinite. (b) zero. (c) in kΩ range. (d) in MΩ range.

31. A transistor can be used as a
(a) amplifier. (b) resistor. (c) capacitor. (d) inductor.

32. A stable carrier wave in radio transmitters will be produced by
(a) signal generator. (b) crystal oscillators.
(c) frequency counter. (d) CRO.

33. Colpitts and clap – gouriet are most commonly used
(a) oscillators. (b) transmitters. (c) receivers (d) transceivers.

34. The reactance of 0.5 H smoothing choke at a frequency of 50 Hz. Is
(a) 25π Ω (b) 50π Ω (c) 200π Ω (d) 250π Ω

35. A simultaneous both-way communications is called
(a) bi communication. (b) simplex. (c) full duplex. (d) half duplex

36. The following stage in a radio receiver provides the maximum image signal selectivity.
(a) Audio amplifier. (b) RF amplifier.
(c) Frequency modulator. (d) Crystal oscillator.

37. A vertical antenna will provide
(a) circular polarization (b) high angle radiation
(c) low angle radiation (d) elliptical polarization

38. The wave length of a signal in free space with a frequency of 300 MHz is
(a) 10 mm. (b) 0.1 m (c) 1 m (d) 10 m

39. A moving coil meter by itself only responds to
(a) DC. (b) AC. (c) AC and DC both. (d) power

40. A reverse biased PN junction allows
(a) current to flow from P to N. (b) non current to flow
(c) electrons to flow from N to P (d) all the above are correct

41. A “trap’ is
(a) a simple stop filter. (b) a simple notch filter.
(c) consisting of a single resonant circuit. (d) all the above are correct.

42. Most amateur speech transmissions are use SSB or FM in
(a) J3E or A3E modes. (b) J3E or F3E modes.
(c) A3E or H3E modes. (d) F3E or H3E modes

43. Which of the following layers tend to combine into a single later at night?
(a) D and E (b) E and F_1 (c) F_1 and F_2 (d) D and F

44. Noise in a frequency modulated system, may be reduced by
(a) decreasing temperature. (b) decreasing deviation
(c) narrowing the band width. (d) widening the band width.

45. The main purpose of performing open-circuit test at rated voltage is to measure
(a) core loss. (b) efficiency. (c) resistance. (d) inductance.

46. The output amplifier of an SSB transmitter must
(a) act as a switch. (b) be in a linear mode.
(c) be in a non linear mode. (d) act as a multiplier.

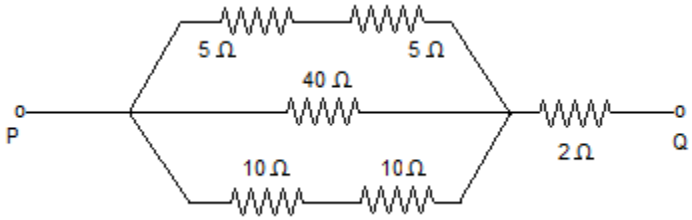
47. Fading can be caused by
(a) a poor antenna. (b) horizontal polarization.
(c) interaction of the sky and ground wave. (d) poor coaxial cable.

48. As frequency increases the ionization to reflect a signal back to the earth must
(a) decrease. (b) go to zero. (c) not change. (d) increase.

49. The signals returned from the layers above the earth are referred to as
(a) the ground wave. (b) the ionospheric wave.
(c) the tropospheric wave. (d) the direct wave.

50. The effective resistance between P and Q of the circuit shown.

(a) 10 Ω (b) 50 Ω (c) 70 Ω (d) 72 Ω



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Answers

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

Q-10 question is incomplete. V and I not defined.

Q-17 No answer. The correct answer is Volt/meter

Q-45 question is not clear.

Q-50 No answer. The correct answer is 7.7 Ω

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(GENERAL CLASS)

Licencing Conditions Operating Practices and Procedures,

One hours

Answer all questions on this paper itself.

Index No:-……..

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1. When an Amateur station is operating from a ship in the Indian Ocean the call sign should be
   (a) 457XX/MM/1 (b) 457XX/MM/2 (c) 457XX/MM/3 (d) 457XX/MM

2. 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 who is very sick to his family.

3. A transmitter operates on a frequency of 145 MHz. Interference is cause to a receiver on the VHF broadcast band (88 – 108 MHz) due to close 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 main supply lead to the transmitter.
   (d) low pass filter in the transmitter antenna feeder.

4. The Purpose of the two tone test in 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.

5. The abbreviation for signals fading is
   (a) QSB (b) QSD (c) QSL (d) QSO

6. Using the international phonetic alphabet GIRL would be
   (a) Green Ivory Red Lima. (b) Golf India Romeo Lima.
   (c) Green India Romeo Lima. (d) Golf India Romeo Lime.

7. The abbreviation WA means on CW
   (a) end of work. (b) word after (c) work after (d) work array

8. Which of the following types of messages can be received by an amateur licensee?
(a) Diplomatic transmission. (b) Standard frequency transmission.
(c) Air force transmission. (d) Secret transmission.

9. Amplitude modulated single side band with suppressed carrier is denoted by
(a) J3E (b) H3E (c) G3E (d) A3E

10. Q code abbreviation QRG means
(a) will you tell me my exact frequency? (b) dose my frequency vary?
(c) what is the tone of my transmission? (d) what is the readability of my signal?

11. Abbreviation KN means
(a) invitation to any station to transmit. (b) invitation to a particular station to transmit.
(c) end of transmission. (d) end of message or communication.

12. “increase power” is given by Q-code
(a) QRO (b) QRP (c) QRQ (d) QRS

13. What emission designator describes PM (Phase modulation) voice transmission?
(a) F3E (b) H3E (c) A3E (d) G3E

14. Which of the following represents a valid amateur station log?
(a) in an exercise book. (b) on a magnetic tape or disc.
(c) on any electronic storage media. (d) all the above are correct.

15. During transmissions, amateur stations are required to transmit their call signs at intervals not exceeding
(a) 2 minutes. (b) 3 minutes. (c) 5 minutes. (d) 7 minutes.

16. Direction CQ calls should
(a) be made. (b) not be made. (c) be acknowledge. (d) not be acknowledge.

17. The satellite transponders will accept
(a) CW. (b) SSB. (c) RTTY. (d) All the above

18. A perfectly matched system will have an SWR
(a) 1 to 1 (b) 1 to 2. (c) 2 to 1. (d) 1 to less than 1

19. The impedance of a λ/2 antenna at the center point is roughly
(a) 70 Ω (b) 50 Ω (c) 300 Ω (d) α Ω

20. The characteristics of the receivers
(a) sensitivity. (b) selectivity.
(c) frequency stability. (d) all the above are correct.

21. Q-code abbreviation QRM means
(a) Are you busy? (b) Are you been interfered with?
(c) Are you troubled by static? (d) Are you ready?

22. The licensee shall keep the log for inspection by an officer authorized by Director General of Telecommunication from the date of last entry for at least
(a) 1 month. (b) 3 months. (c) 6 months. (d) 1 year.

23. The purpose of a terrestrial repeater is to
(a) increase satellite coverage. (b) increase the range of mobile stations.
(c) increase the range of fixed stations (d) minimize contacts by pedestrian stations.

24. The band plan should be observed because
(a) they are mandatory. (b) they are governed by international regulation.
(b) they are intended to aid operating. (d) they are only for novices.

25. It is good safety practice to
(a) use plastic piping for earthing. (b) unearth all metal cases.
(c) have no master switch. (d) supply all main power via a master switch.

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Answers

1. d	2. d	3. b	4. d	5. a
6. b	7. b	8. b	9. a	10. a
11. b	12. a	13. d	14.a	15. c
16. a	17. d	18. a	19. a	20. d
21. b	22. d	23. b	24. b	25. d

Q-1 No answer. The correct answer is "4S7XX/MM" (No prefix as "457" use in the world)

Q-5 QSD = signals mutilated, QSL = acknowledge, QSO = conversation

Q-7 This is not use in amateur radio.

Q-12 QRP = Reduce power or Low power, QRQ = send faster QRS = send slowly

Q-16 Typing error. "Direction" should be type as " Directional"