EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICENCY ISSUED
BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKA – FEBRUARY 1997
(NOVICE CLASS)
Basic Electricity, Radio and Electronics Theory

Two hours

Index No :.............................

Answer all questions. A minimum of 50 marks is required for a pass.
Choose the correct answer and underline it.

1. Hertz is a measuring unit of
    (a) Frequency   (b) Resistance   (c) Inductance   (d) Capacitance

2. The peak-to-peak value of the 230V, 50Hz main supply is
    (a) 230 V   (b) $230\sqrt{2}$ V   (c) $2 \times 230\sqrt{2}$ V   (d) $230/\sqrt{2}$ V

3. The diameter of a current carrying conductor is doubled. The resistance will be
    (a) half   (b) one fourth   (c) twice   (d) same

4. The effective resistance between A and B in the circuit shown is
    (a) $2\ \Omega$
    (b) $4\ \Omega$
    (c) $6\ \Omega$
    (d) $8\ \Omega$
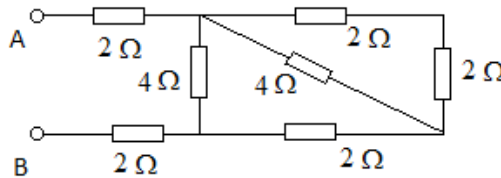
5. $0.01\mu F$ capacitance is equivalent to
    (a) 1×10^{-6} F   (b) 1×10^{-7} F   (c) 1×10^{-8} F   (d) 1×10^{-9} F

6. The reactance of a 2mH smoothing choke at a frequency of 50Hz is
    (a) $2 \times 10^{-1}\ \pi\ \Omega$ (b) $2 \times 10^{-2}\ \pi\ \Omega$ (c) $1 \times 10^{-1}\ \pi\ \Omega$ (d) $1 \times 10^{-2}\ \pi\ \Omega$

7. A coil has a resistance of 3Ω. The inductive reactance of the coil is
    (a) $2\ \Omega$ (b) $3\ \Omega$ (c) $4\ \Omega$ (d) $8\ \Omega$

8. The equation which does not give the power P dissipated in a resistor R is
    (a) $P = V^2/R$ (b) $P = V I$ (c) $P = I^2 R$ (d) $P = I^2/R$
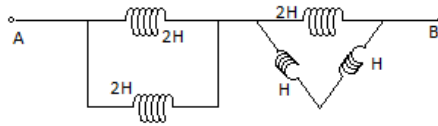
9. What is the total capacitance between the points A and B?
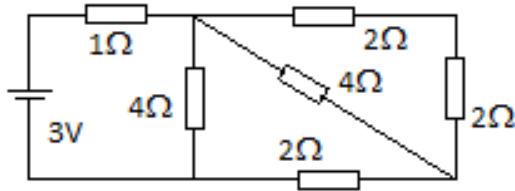   (a) C
    (b) 2C
    (c) 3C
    (d) 4C
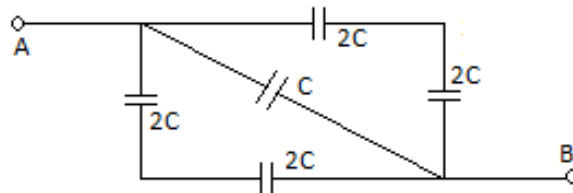
10. The total inductance between A and B in the circuit is
    (a) H
    (b) 2H
    (c) 3H
    (d) 4H

11. The two basic forms of transistors are
    (a) PNP and NNP   (b) PPN and NNP   (c) PNP and NPN   (d) PPN and NPN

12. The power dissipation in the 1Ω resistor of the circuit shown is
    (a) 250 mW.   (b) 500 mW.   (c) 1 W.   (d) 2W.

13. The magnification factor of a series (LRC) circuit is given by
    (a) $Q = \omega LR$ (b) $Q = \omega L/C$ (c) $Q = \omega L/R$ (d) $Q = \omega C/L$

14. A half wave antenna is resonant at 60 MHz. Its approximate length will be
    (a) 2.5 m   (b) 5m   (c) 7.5 m   (d) 10 m

15. The frequency range from 3MHZ to 30 MHz is generally referred to as
    (a) Ultra high frequency.   (b) Very high frequency.
    (c) High frequency.   (d) Low frequency.

16. 3 dB power gain is equivalent to an increase of gain by
    (a) 2 times.   (b) 3 times.   (c) 10 times.   (d) 30 times.

17. A 100Ω resistor dissipates a power of 0.25 W. The current flowing across the resistor is
    (a) 0.01 A.   (b) 0.05 A.   (c) 0.1 A.   (d) 0.5 A.

18. The input power of a transmitter running at 12 V, 2 A. is
    (a) 12 W.   (b) 24 W.   (c) 48 W.   (d) 96 W.

19. The radiation resistance of a folded dipole is
    (a) 50Ω   (b) 75Ω   (c) 300Ω   (d) 600Ω

20. 0.001 microhenry inductance is equivalent to
    (a) 1×10^{-6} H   (b) 1×10^{-7} H   (c) 1×10^{-8} H   (d) 1×10^{-9} H

21. The electric field of an antenna is parallel to the earth's surface . The antenna's polarization is
    (a) vertical.   (b) horizontal.   (c) circular.   (d) none of the above.

22. When 2V emf is applied across a 2F capacitor, the energy stored in the capacitor is
    (a) 2 J.   (b) 4 J.   (c) 8J.   (d) 16 J.

23. The prefix "kilo" is equivalent to
    (a) 10^{-3} (b) 100^{-1} (c) 10^{1} (d) 10^{3}

24. In the ionosphere D layer is the
    (a) `upper most layer   (b) lowest layer   (c) medium height layer   (d) none of these

25. The basic concept of Amplitude Modulation (AM) is to vary the
    (a) amplitude of carrier signal.   (b) frequency of carrier signal.
    (c) amplitude of modulating signal.   (d) frequency of modulating signal.

26. Envelop or diode detector is used for the detection of
    (a) CW signal.   (b) AM signals.   (c) SSB signal   (d) FM signals.

27. The total power content of an Amplitude Modulated signal is 10W, and the percentage modulation is 100%. The power transmitted by the side bands are
    (a) 3.33 W.   (b) 6.67 W.   (c) 5 W.   (d) 10 W.

28. As the frequency rises the reactance of an inductor is
    (a) increases.   (b) decreases.   (c) stays constant.   (d) none of these.

29. The value of the resistor shown in the figure is

Orange	orange	Red

    (a) 33Ω   (b) 330Ω   (c) 3.3kΩ   (d) 33kΩ
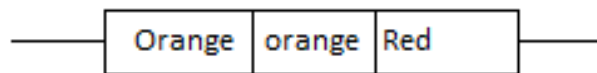
30. The wave length of a signal at 30MHz in the free space is
    (a) 1m.   (b) 10 m.   (c) 100 m   (d) 0.1 m

31. 21.24 MHz is the third harmonic of
    (a) 10.62 MHz   (b) 7.08 MHz   (c) 3.54 MHz   (d) 1.77 MHz

32. A transformer is laminated to
    (a) reduce hysteresis losses.   (b) reduce eddy current losses.
    (c) increase exciting current.   (d) increasing magnetic flux.

33. For better signal reception, the S/N ratio should be
    (a) low.   (b) medium.   (c) high.   (d) zero.

34. The addition of reflectors and a director to a folded dipole
    (a) increases its impedance.   (b) decreases its impedance.
    (c) has no effect on its impedance.   (d) none of these.

35. In a RLC series circuit at resonance, the impedance is
    (a) zero.   (b) minimum.   (c) maximum.   (d) infinity.

36. Signals in the VHF range uses
    (a) space wave propagation.   (b) sky wave propagation.
    (c) ground wave propagation.   (d) any of these.

37. The ratio detector is used for the detection
    (a) CW signal.   (b) SSB signal.   (c) AM signals   (d) FM signals.

38. The output signal of a balanced modulator is
    (a) DSB.   (b) SSB.   (c) AM.   (d) FM.

39. The resonant frequency of a tuned (LRC) circuit is given by
    (a) $\frac{\sqrt{L/C}}{2\pi}$ (b)) $\frac{\sqrt{LC}}{2\pi}$ (c) $2\pi/\sqrt{(LC)}$ (d) $1/2\pi\sqrt{(LC)}$

40. A 50MHz carrier signal having an amplitude of 60V modulated by a 3kHz audio signal having an amplitude of 20V. The modulation factor of the amplitude wave is
    (a) 0.33   (b) 0.5   (c) 0.66   (d) 1.0

41. What is the characteristic impedance of a transmission line which has a capacitance of 60pF/m and an inductance of 0.15 µH/m.
    (a) 10 Ω   (b) 50 Ω   (c) 100 Ω   (d) 500 Ω

42. The moving coil instrument can be used to measure
    (a) ac values only.   (b) dc values only.
    (c) both ac and dc values.   (d) frequency of a wave form.

43. For ideal amplitude modulated signal, the modulation index must be
    (a) zero.   (b) smaller than one.   (c) greater than one.   (d) none of these.

44. E layer is
    (a) the highest layer in the ionosphere.   (b) the lowest layer in the ionosphere.
    (c) the medium layer in the ionosphere.   (d) none of the above.

45. The energy stored in an inductor L is given by
    (a) LV/2   (b) LI/2   (c) $LI^2/2$ (d) LIV/2

46. The conductivity of a current carrying conductor can be decreased by
    (a) reducing its temperature.   (b) reducing its diameter.
    (c) reducing its length.   (d) none of the above.

47. The ability of receiver to pick up weak signal is called
    (a) selectivity.   (b) sensitivity.   (c) stability.   (d) none of the above.

48. The automatic gain control (AGC) circuit is usually used to control the gain of the
    (a) IF amplifier.   (b) mixer.   (c) detector.   (d) audio amplifier.

49. The symbol shown indicates a
    (a) Light emitting diode.   (b) Silicon diode.
    (c) Zener diode   (d) Audio amplifier.

50. One way communication is called
    (a) monocom   (b) Simplex   (c) half duplex   (d) full duplex

Department of Examinations, Sri Lanka

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(NOVICE CLASS)
Licensing Conditions, Operating Practices and Procedures

One hour

Index No :.............................

Answer al l questions on this paper itself.
A minimum of 50 marks is required for a pass.
Choose the correct answer and underline it.

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

2. Q-code abbreviation QRU means
    (a) Have you anything for me?   (b) Are you ready?
    (c) When will you call me again?   (d) Who is calling me?

3. Q-code abbreviation QSD means
    (a) What is the strength of my signals?   (b) Are my signals fading?
    (c) Is my keying defective?   (d) Can you give me acknowledgement of receipt?

4. "Your frequency varies" is given by Q-code
    (a) QRL   (b) QRK   (c) QRI   (d) QRH

5. "Your signals are fading" is given by Q-code
    (a) QSA   (b) QSB   (c) QSD   (d) QSL

6. "I am troubled by static" is given by Q-code
    (a) QRN   (b) QRM   (c) QRL   (d) QRV

7. Abbreviation **AS** means
    (a) end of work.   (b) end of message.   (c) stand by.   (d) starting signal.

8. Abbreviation **"HW?"** means
    (a) who is calling me?   (b) Have you anything for me?
    (c) How are you?   (d) How do you receive me?

9. Abbreviation for **"closing station"** is
    (a) AR   (b) CL   (c) VA   (d) AS

10. Abbreviation for **"invitation to any station to transmit"** is
    (a) K   (b) KN   (c) KA   (d) AR

11. Using voice modulation **H3E** corresponds to
    (a) FM (b) DSB
    (c) SSB with full carrier. (d) SSB with suppressed carrier.

12. Using voice modulation **G3E** corresponds to
    (a) DSB (b) SSB (c) FM (d) PM

13. What emission designator describes **FM** voice transmission?
    (a) A3E (b) F3E (c) H3E (d) J3E

14. Amplitude modulated Single Side Band (SSB) with suppressed carrier is denoted by
    (a) J3E (b) H3E (c) G3E (d) A3E

15. Classes of emission are designated by groups of minimum of three (03) characters. Its first character
    (a) type of information to be transmitted. (b) nature of signals modulating the main carrier
    (c) type of modulation of the main carrier (d) none of the above.

16. Which of the following types of messages **cannot** be transmitted over amateur radio?
    (a) messages on behalf of a third party. (b) messages for pecuniary reward.
    (c) messages of religious nature. (d) all the above are correct.

17. When calling a station it is a good practice to
    (a) put your call sign first. (b) put the call sign of the station being called first.
    (c) use your call sign only. (d) use the call sign of the other station only.

18. Before initiating a "CQ" call
    (a) Listen on the frequency. (b) Send a series of V s.
    (c) keep giving your call sign. (d) all the above are correct.

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

20. In the RST code, R represents
    (a) Radio contact. (b) Relay message. (c) Received all signals. (d) Readability of signals.

21. In amateur transmission, it is not permissible to use
    (a) plain language. (b) secret code.
    (c) phonetic alphabet. (d) the word of a third party publicly spoken.

22. The novice class B licence does not authorize the use of the frequencies for transmitting
    (a) below 30 MHz. (b) above 30 MHz.
    (c) in the microwave range. (d) none of these.

23. Which of the following need not be entered in the station log book?
    (a) transmitter power.   (b) test carried on.
    (c) output power   (d) station operated at temporary location.

24. The correct phonetic alphabet for word "BLUE" is
    (a) Bravo, Lionel, Uniform, Echo   (b) Bravo, Lionel, Ungle, Echo
    (c) Bravo, Lima, Uniform, Edward   (d) Bravo, Lima, Uniform, Echo

25. The correct group using the international phonetic alphabet is
    (a) Charlie, France, Golf Yankee.   (b) Charlie, Foxtrot, Golf, Yankee.
    (c) Charlie, Foxtrot, Golf, York.   (d) Charlie, Foxtrot, George, Yankee.

Answers
Basic Electricity ….

    1. a   2. c   3. b   4. c   5. c   6. a   7. ??   8. d   9. c   10. b

    11. c   12. c   13. c   14. a   15. c   16. a   17. b   18. b   19. c   20. d

    21. b   22. b   23. d   24. b   25. a   26. b   27. b   28. a   29. c   30. b

    31. b   32. b   33. c   34. b   35. b   36. c   37. d   38. a   39. d   40. c

    41. b   42. b   43. b   44. c   45. c   46. b   47. b   48. a   49.   50. a
Q-7 is wrong (incomplete)
Q-48 diagram is not there

Licening Conditions …..

    1. b   2. a   3. c   4. d   5. b   6. a   7. c   8. c   9. b   10. a

    11. c   12. d   13. b   14. a   15. c   16. d   17. b   18. a   19. d   20. d

    21. b   22. a   23.   24. d   25. b