

Department of Examinations, Sri Lanka
EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENCY ISSUED
BY THE DIRECTOR GENERAL OF TELECOMMUNICATION, SRI LANKA – 2002
(NOVICE CLASS)

Basic Electricity, Radio and Electronics Theory

Answer all questions on this paper itself.

Two hours

Pick out correct answer and underline it. Pass mark 50%

Index No:.....

1. Hertz is a measuring unit of

- (a) voltage (b) current (c) frequency (d) resistance

2. $V = IR$ is called

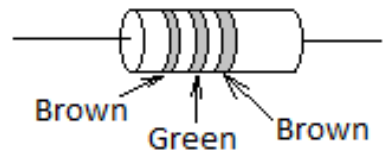
- (a) Thevanin's law (b) Ohm's law (c) Norton's theorem (d) Kirchhoff's law

3. The symbol  is indicates in electrical circuits

- (a) a power source (b) voltmeter (c) ammeter (d) resistor

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

- (a) 1.5Ω (b) 15Ω (c) 150Ω (d) 1500Ω



5. A coil has a resistance of $X \Omega$ and Y reactance of 6Ω . The impedance is

- (a) \sqrt{XY} (b) $\sqrt{X+Y}$ (c) $\sqrt{X/Y}$ (d) $\sqrt{X^2 + Y^2}$

6. A circuit element absorbs 500W of power with a current of 10A. Its voltage is

- (a) 510 V (b) 490 V (c) 500 V (d) 50 V

7. The internal resistance of an ideal current source is

- (a) finite (b) infinite (c) unknown (d) zero

8. 0.1 Pico farad is equal to

- (a) $1 \times 10^{-10} \text{ F}$ (b) $1 \times 10^{-11} \text{ F}$ (c) $1 \times 10^{-12} \text{ F}$ (d) $1 \times 10^{-13} \text{ F}$

9. The peak to peak value of 220V, 50Hz main supply is

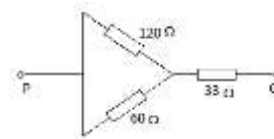
- (a) $220\sqrt{2} \text{ V}$ (b) $2 \times 220\sqrt{2} \text{ V}$ (c) 220 V (d) $220\sqrt{2}$

10. A transformer is laminated to

- (a) reduce eddy current (b) increase eddy current
(c) reduce hysteresis losses (d) increase hysteresis losses

11. The effective resistance between P and Q in the circuit is

- (a) 33 Ω (b) 73 (c) 60 (d) 120



12. The number of layers in thyristor are

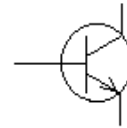
- (a) one (b) two (c) three (d) four

13. What is the power consumed by transmitter taking 0.5 A at 6 V.

- (a) 3 W (b) 6 W (c) 30 W (d) 300 W

14. The symbol shown indicates a

- (a) Bipolar transistor (b) Silicon controlled rectifier
 (c) Zener diode (d) FET

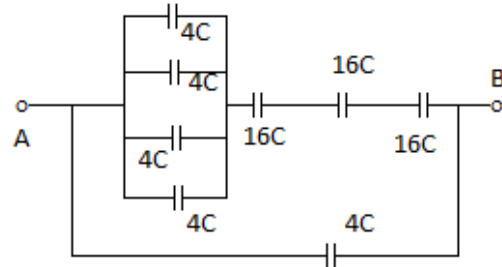


15. Ratio detector is used for the detection of

- (a) CW signal (b) FM signal (c) SB signal (d) AM signal

16. What is the capacitance between the points A and B in the given circuit?

- (a) C
 (b) 4C
 (c) 8C
 (d) 16C



17. The resonant frequency of tuned (LRC) circuit is

- (a) $\frac{1}{2\pi\sqrt{LC}}$ (b) $\frac{1}{2\pi}\sqrt{L/C}$ (c) $\frac{1}{2\pi}\sqrt{L/C}$ (d) $\frac{2\pi}{\sqrt{LC}}$

18. The output signal of a balanced modulator is

- (a) DSB (b) AM (c) FM (d) SSB

19. A properly terminated transmission line has a reflection coefficient of

- (a) zero (b) 0.5 (c) 1 (d) infinity

20. The radiation resistance of a folded dipole antenna is

- (a) 50Ω (b) 75Ω (c) 150Ω (d) 300Ω

21. The meggar is used for
 (a) measuring current (b) measuring voltage
 (c) measuring power (d) testing insulation
22. When 4V emf is applied across a 1F capacitor the energy stored in the capacitor is
 (a) 2J (b) 4J (c) 8J (d) 16J
23. Power factor of a pure inductor is
 (a) zero (b) one (c) 0.5 (d) more than one
24. A 75 MHz carrier signal having an amplitude of 50V is modulated by a 3kHz audio signal having an amplitude of 20V. The modulation factor of the amplitude modulated wave is
 (a) 0.4 (b) 0.6 (c) 0.8 (d) 1.0
25. What is the characteristic impedance of a transmission line which has a capacitance of 50 PF/M
 (a) $10/\pi \Omega$ (b) 100Ω (c) $\sqrt{3} \times 100 \Omega$ (d) $(1/\sqrt{3})$
26. For better signal reception, the S/N ratio should be
 (a) low (b) medium (c) high (d) zero
27. The automatic gain control (AGC) circuit is usually used to control
 (a) mixer (b) detector (c) IF amplifier (d) audio amplifier
28. Which amplifiers are used to increase RF power level in AM transmitters
 (a) class AB (b) class C (c) class B (d) Class A
29. In the ionosphere, the lowest layer is
 (a) D layer (b) E layer (c) F₁ layer (d) F₂ layer
30. As frequency increases the reactance of an inductor
 (a) decrease (b) increase (c) stay constant (d) none of these
31. As voltage increases the capacitance of a capacitor
 (a) decrease (b) increase (c) stay constant (d) none of these
32. As frequency increases the reactance of a resistor
 (a) decrease (b) increase (c) stay constant (d) none of these
33. The average value of a sine wave is\
 (a) 1 (b) peak value $/\sqrt{2}$ (c) peakvalue $\times \sqrt{2}$ (d) zero
34. Current is defined as
 (a) rate of change of charge (b) rate of change of flux
 (c) rate of change of voltage (d) product of charge and time

35. The voltage and current across a resistor are 5V and 2A respectively. Its resistance and power are
 (a) 2.5Ω and 10W (b) 0.5Ω and 10W (c) 3.0Ω and 7W (d) 3.0Ω and 3W
36. For d.c. voltage an ideal inductor act as
 (a) an open circuit (b) a short circuit (c) a finite resistance (d) 7.0Ω and 3W
37. A capacity is defined by
 (a) $Q = CV$ (b) $i = C(dv/dt)$ (c) $V = C(di/dt)$ (d) $Q = CI$
38. Conductance of a piece of material of resistivity $\rho = 3 \times 10^{-3}$ Ohm/m of length $L = 4000$ m and cross sectional area of $A = 6 \times 10^{-6}$ m² is
 (a) $\frac{1}{2} \times 10^6$ (b) $\frac{1}{2} \times 10^{-6}$ (c) 2×10^6 (d) 2×10^{-6}
39. Over modulation in a FM transmission will cause
 (a) heavy distortion. (b) to occupy wide bandwidth.
 (c) to occupy narrow bandwidth. (d) remains unchanged.
40. What happens to the input impedance of a Yagi antenna when more elements are added?
 (a) decrease. (b) increase. (c) will cause unbalanced. (d) remains unchanged.
41. Zener diodes are used in
 (a) modulator. (b) demodulator. (c) dc power supply. (d) frequency mill.
42. Moving coil instrument can be used to measure
 (a) ac value only. (b) dc value only.
 (c) both ac and dc values. (d) frequency of a wave form.
43. The frequency range from 30MHz – 300MHz is
 (a) low frequency. (b) high frequency.
 (c) very high frequency. (d) ultra high frequency.
44. Transformers operate on
 (a) an ac supply only. (b) both ac and dc supply.
 (c) a dc supply only. (d) all of the above are not correct
45. 30 dB power gain is an increase by
 (a) 3 time. (b) 30 times. (c) 100 times. (d) 1000 times.
46. For constant dc voltage a capacitor act as
 (a) a short circuit. (b) an open circuit. (c) a finite resistance. (d) a switch.
47. One way communication is called
 (a) simplex. (b) half duplex. (c) duplex. (d) inter corn.

48. 35.1MHz is the third harmonic of
(a) 175.5 MHz. (b) 105.3 MHz. (c) 70.2 MHz. (d) 11.7 MHz.

49. The ability of a receiver to separate signals on different frequencies is defined as
(a) sensitivity. (b) selectivity. (c) screening. (d) none

50. The unit of magnetic field is
(a) hertz. (b) ampere / meter. (c) volt. (d) ohm.

Answers:-

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

Q-38 unit of resistivity is Ohm-m, it is not Ohm/m

Q-47 no meaning of "inter com"

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Licensing Conditions, Operating Practices & Procedures

Answer all questions on this paper itself.

One hour

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Index No:.....

-
1. All times entered in the log book shall be in
 - (a) Local time of the transmitting station
 - (b) local time of the receiving station
 - (c) in standard time of the region
 - (d) UTC

 2. Abbreviation for closing station is
 - (a) CP
 - (b) C
 - (c) CL
 - (d) CQ

 3. Items that are to be inspected by an officer acting under the director general of telecommunication Regulatory Commission
 - (a) log book only.
 - (b) station and log book only.
 - (c) station, log book and licence.
 - (d) log book and licence only.

 4. Direction CQ call should be
 - (a) be made only on CW
 - (b) not be acknowledged
 - (c) not be made
 - (d) be acknowledged

 5. Telegraphy by on-off keying of an amplitude modulated audio frequency, double sideband, for reception by ear is denoted by
 - (a) A2A
 - (b) A1A
 - (c) A2B
 - (d) H2B

 6. To prevent annoying other users on a band, a transmitter could always be tuned initially.
 - (a) on a harmonic out side the band
 - (b) into an antenna that dissipate very low radiation
 - (c) into a matched load
 - (d) into a dummy load

 7. When using phonetics the licence document specifies that the phonetic alphabet
 - (a) should be used
 - (b) is not necessary
 - (c) is mandatory
 - (d) none of these

 8. Time in the log book must always be in
 - (a) local time
 - (b) UTC
 - (c) BST
 - (d) any one of the above

 9. Before initiating a CQ, the signal "QLR" is often send
 - (a) once only
 - (b) two or three times
 - (c) five or six times
 - (d) any number of times

 10. Abbreviation for "stand by" is
 - (a) AS
 - (b) AR
 - (c) VA
 - (d) SK

11. 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 micro wave range (d) All of above
12. Which of the following occurrences need not be entered in the station log book?
(a) initial calls (CQ calls) (b) call sign of calling station
(c) details of tests carried out (d) station operated at a temporary location
13. During transmission 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
14. In RST code T for
(a) time of transmission (b) transmitter (c) tone (d) temperature
15. Before initiate a "CQ" call
(a) listen on the frequency
(b) send "QRL signal often 2 or 3 times
(c) "CQ" calls to a specific is avoided
(d) all the above are correct
16. Amplitude modulated double side band (DSB) is designated by
(a) A3E (b) F3E (c) H3E (d) J3E
17. What emission designator describes FM voice transmission
(a) A3E (b) F3E (c) H3E (d) H3E
18. "Please change frequency" is given by Q-code
(a) QSV (b) QSY (c) QSP (d) QST
19. "Your keying is defective" is given by Q-code
(a) QSV (b) QSB (c) QSY (d) QSD
20. "I am ready" is given by Q-code
(a) QRV (b) QRP (c) QRV (d) QRQ
21. The correct group using the International Phonetic Alphabet is
(a) NOVEMBER SIERRA UNIFORM VICTOR
(b) NOVEMBER SARAH UNIFORM VICTOR
(c) NOVEMBER SIERRA UNIFORM VIOLET
(d) NOVEMBER SIERRA UNCLE VICTOR
22. The correct phonetic alphabet for the word WIRE is
(a) WHISKEY INDIA ROMEO ECHO
(b) WHISKEY ISSAC ROMEO ECHO
(c) WILLIAM ISSAC ROMEO ECHO
(d) WILLIAM ISSAC ROBERT EDWARD

23. Abbreviation KA means
 (a) Starting signal (b) end of work (c) Please do not interfere (d) end of QSO
24. Q-code abbreviation QTH means
 (a) What is your location (b) Are my signal fading
 (c) Is my keying defective (d) What is the strength of my signal
25. When operating in mobile, the licence shall have the call sign with the suffix
 (a) /MM (b) /p (c) /M (d) /PP

Answers

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

- Q-9 is wrong no meaning with QLR
 Q-12 typing errors (CQ cell and celling station)
 Q-15 spelling mistake
 Q-17 typing error
 Q-20 same answer in (a) and (c)
 Q-24 typing error
 Q-25 typing errors