

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENCY
ISSUED BY THE DIRECTOR GENERAL OF TELECOMMUNICATION OF SRI LANKA
NOVEMBER 1997 (NOVICE CLASS)

Basic Electricity, Radio & Electronic Theory

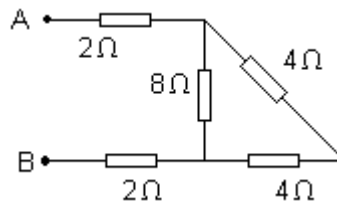
Two hours

Index No.

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

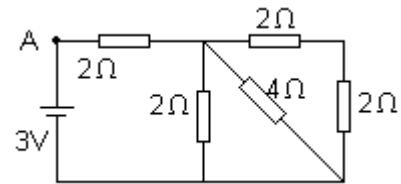
- Ohm is a unit of
(a) Resistance (b) Inductance (c) Capacitance (d) Frequency
- The peak value of the 230V, 50Hz mains supply is
(a) 230V (b) $230\sqrt{2}$ V (c) $2 \times 230\sqrt{2}$ V (d) $230 / \sqrt{2}$ V
- If the length of a current carrying conductor is doubled, the resistance will become
(a) half (b) double (c) one fourth (d) same
- The effective resistance between A and B in the circuit shown is

- (a) 2Ω (b) 4Ω
(c) 6Ω (d) 8Ω



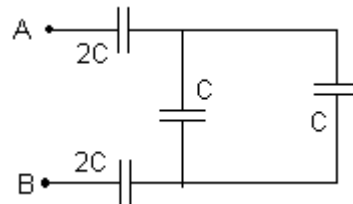
- $0.1 \mu\text{F}$ capacitance is equivalent to
(a) 1×10^{-6} F (b) 1×10^{-7} F (c) 1×10^{-8} F (d) 1×10^{-9} F
- What is the magnitude of the current flowing through AB in the circuit shown below?

- (a) $\frac{1}{2}$ A (b) 1 A
(c) $\frac{3}{2}$ A (d) 2 A



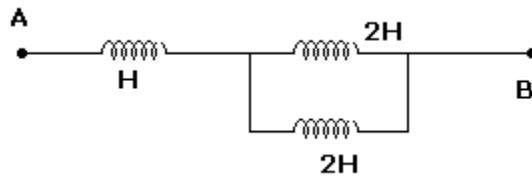
- The two basic forms of transistors are
(a) PNP and NPN (b) PPN and NNP (c) PNN and NPP (d) PPP and NNN

- What is the total capacitance between the points A and B?



- The reactance of a 5mH smoothing choke at a frequency of 50Hz is
(a) $1 \times 10^{-1} \pi \Omega$ (b) $2 \times 10^{-1} \pi \Omega$ (c) $5 \times 10^{-1} \pi \Omega$ (d) $1 \times 10^{-2} \pi \Omega$

10. The total inductance between A and B in the circuit shown is
 (a) H (b) 2H (c) 3H/2 (d) 2H/3



11. A half wave antenna is resonant at 100MHz. It's approximate length will be
 (a) 6m. (b) 4.5m. (c) 3m. (d) 1.5m.
12. The frequency range from 30 MHz to 300 MHz is generally referred to is
 (a) Ultra high frequency. (b) Very high frequency.
 (c) High frequency. (d) Low frequency.
13. A 400Ω resistor dissipates a power of 0.25W. The current flowing across the resistor is
 (a) 0.025A. (b) 0.25A. (c) 0.0013A. (d) 0.028A.
14. A 3dB power gain is equivalent to an increase of gain by
 (a) 2 times (b) 3 times (c) 10 times (d) 30 times
15. The input power of a transmitter running at 24 V, 2.5 A is
 (a) 24 W. (b) 48 W. (c) 60 W (d) 72 W
16. The radiation resistance of a folded dipole antenna is
 (a) 50 Ω (b) 75 Ω (c) 100 Ω (d) 300 Ω
17. The prefix "Mega" is equivalent to
 (a) 10^{-6} (b) 10^{-3} (c) 10^3 (d) 10^6
18. The wavelength of a signal at 60 MHz in free space is
 (a) 0.5m. (b) 5m. (c) 10m. (d) 50m.
19. As the frequency rises, the reactance of an inductor
 (a) increases (b) decreases (c) stays constant (d) none of these
20. The D layer of the ionosphere is
 (a) the lowest layer. (b) the medium height layer
 (c) the upper most layer (d) none of these.
21. The output signal of a balanced modulator is
 (a) SSB (b) DSB (c) AM (d) FM
22. The moving coil instrument can be used to measure
 (a) a.c. values only (b) d.c. values only
 (c) both d.c. and a.c. values (d) none of these
23. The energy stored in an inductor L is given by
 (a) $\frac{1}{2}LV$ (b) $\frac{1}{2}LI$ (c) $\frac{1}{2}LI^2$ (d) $\frac{1}{2}LVI$
24. When 2V e.m.f. applied across an 1F. capacitor, the energy stored in the capacitor is
 (a) 1 J. (b) 2 J. (c) 4 J. (d) 8 J.
25. A coil has a resistance of 3Ω and an inductive reactance of 4 Ω. The impedance of the coil is
 (a) 21 Ω (b) 3Ω (c) 5 Ω (d) 7 Ω

26. The purpose of adding reflector and directors to a folded dipole antenna is
 (a) to increase its impedance. (b) to decrease its impedance.
 (c) to have some effect on its impedance (d) none of the above.

27. Velocity of radio waves in free space is
 (a) 3×10^6 m/s (b) 3×10^8 m/s (c) 3×10^9 m/s (d) 3×10^{10} m/s

28. Envelope of diode detector is used for the detection of
 (a) AM signals. (b) FM signals (c) SSB signals (d) CW signals

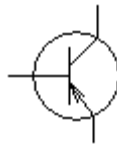
29. To determine the voltage polarity across a resistor, we should know,
 (a) the magnitude of the current. (b) the direction of the current.
 (c) the value of the resistor. (d) the battery voltage.

30. The ability of a receiver to pickup weak signal is
 (a) selectivity (b) sensitivity (c) stability (d) none of these

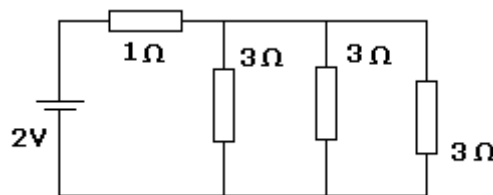
31. The unit of electric current is
 (a) Ampere (b) Ampere meter (c) Volt (d) Hertz

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

33. The symbol shown indicates a
 (a) pnp transistor (b) npn transistor.
 (c) field effect transistor. (d) diode



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



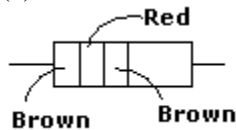
35. 0.001 microhenry inductance is equivalent to
 (a) 1×10^{-6} H (b) 1×10^{-7} H (c) 1×10^{-8} H (d) 1×10^{-9} H

36. 29.1 MHz is the third harmonic of
 (a) 9.7 MHz. (b) 19.4 MHz. (c) 87.3 MHz. (d) 90 MHz.

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

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

39. The equation which does not give the power dissipated in a resistor R is
 (a) $P = VI$ (b) $P = V^2/R$ (c) $P = I^2R$ (d) $P = I^2/R$
40. The magnification factor of a series (LRC) circuit is given by
 (a) $Q = \omega L/R$ (b) $Q = \omega LR$ (c) $Q = \omega C/L$ (d) $Q = \omega L/C$
41. 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
42. One way communication is called
 (a) simplex (b) half duplex (c) duplex (d) monocom
43. 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.
44. The total power content of an amplitude modulated signal is 10W, and the percentage modulation is 100%. The power transmitted by the side bands is
 (a) 3.33 W (b) 6.67 W (c) 5 W (d) 10 W
45. The ionosphere layer which has the greatest effect on the radio signal is
 (a) D layer (b) E layer (c) F layer (d) none of these layers.
46. The transformer is used to change the value of
 (a) power (b) frequency (c) voltage (d) none of these
47. The electric field of an antenna is parallel to the Earth's surface. The polarization of the antenna is
 (a) horizontal (b) vertical (c) circular (d) none of these.
48. The value of the resistor shown in the figure is
 (a) 12Ω (b) 21Ω (c) 120Ω (d) 210Ω



49. An antenna whose input impedance is 50Ω Should have a feeder link with an impedance of
 (a) 50Ω (b) 75Ω (c) 150Ω (d) 300Ω
50. The Meggar is used for
 (a) measuring current (b) measuring voltage
 (c) measuring power (d) testing insulation

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Licensing Conditions, Operating practices and Procedures

One hours

Index No.

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1. Q-code abbreviation "QRG" means
(a) Will you tell me my exact frequency ?
(b) Does my frequency vary ?
(c) What is the tone of my frequency
(d) What is the readability of my signal ?
2. Q-code abbreviation "QRL" means
(a) Are you troubled by static ?
(b) Are you being interfered with ?
(c) Are you busy ?
(d) Are you ready ?
3. Q-code abbreviation "QRO" means
(a) Shall I send more slowly ?
(b) Shall I send faster ?
(c) Shall I decrease power ?
(d) Shall I increase power ?
4. Q-code abbreviation "QRT" means
(a) Shall I send more slowly ?
(b) Shall I stop sending ?
(c) Shall I send a series of VVVS ?
(d) Shall I change to another frequency ?
5. "When will you call me again ?" is given by Q-code
(a) QRX (b) QRV (c) QRU (d) QRZ
6. "Your keying is defective" is given by Q-code
(a) QSA (b) QSB (c) QSD (d) QSL
7. "Change to transmission on another frequency" is given by Q-code.
(a) QSY (b) QSV (c) QSP (d) QSO
8. Using voice modulation, G3E corresponds to
(a) FM (b) PM (c) DSB (d) SSB
9. Using voice modulation, J3E corresponds to
(a) FM (b) DSB (c) SSB with full carrier (d) SSB with suppressed carrier.
10. Amplitude modulated double-side band (DSB) is designated by
(a) J3E (b) H3E (c) A3E (d) F3E
11. What emission designator describes FM voice transmission ?
(a) J3E (b) H3E (c) A3E (d) F3E
12. Abbreviation for "stand by" is
(a) AR (b) AS (c) SK (d) VA

13. Abbreviation for “How do you receive me” is
 (a) HW (b) HR (c) HV (d) HY
14. Abbreviation K means
 (a) end of transmission (b) end message or communication
 (c) invitation to any station to transmit. (d) invitation to a particular station to transmit.
15. Which of the following types of message cannot be transmitted over amateur radio ?
 (a) messages relating to technical investigation (b) those of personal affairs.
 (c) the words of a third party publicly spoken (d) message of a religious nature.
16. Classes of emissions are designated by groups of a minimum of three (03) characters. Its second character denotes
 (a) Type of modulation of the main carrier. (b) Nature of signal(s) modulating the main carrier.
 (c) Type of information to be transmitted. (d) none of the above.
17. In amateur transmission, it is permissible to use
 (a) plain languages. (b) phonetic alphabet.
 (c) Q-code (d) all the above are correct
18. Which of the following need not be entered in the station log book ?
 (a) initial calls (CQ calls). (b) station operated at a temporary location.
 (c) callsign of calling station (d) transmitter power.
19. The amateur radio equipment can be used for
 (a) self training (b) communication of the business.
 (c) transmitting news. (d) transmitting advertisements.
20. In RST code, T represents
 (a) transmitter power (b) tone
 (c) time of transmission (d) temperature of PA stage.
21. Which of the following are to be inspected by an officer acting under the authority of the Director-General of communications ?
 (a) Station, log book and license (b) station and log book only.
 (c) log book and license only (d) log book only.
22. Telegraphy by on-off keying of an amplitude modulated audio frequency for automatic reception is denoted by
 (a) A1A. (b) A1B (c) A2A (d) A2B
23. At any time for a single transmission the licensee **cannot** transmit for a continuous period of
 (a) more than 3 minutes. (b) more than 5 minutes.
 (c) more than 10 minutes (d) more than 15 minutes.
24. The correct phonetic alphabet for the word “NICE” is
 (a) NELLY, INDIA, CHARLIE, ECHO.
 (b) NOVEMBER, ISACK, CHARLLI, ECHO
 (c) NOVEMBER, INDIA, CHARLIE, EDWARD
 (d) NOVEMBER, INDIA, CHARLIE, ECHO.
25. The correct group using international phonetic alphabet is
 (a) KILO, LIMA, MIKE, ROMEO
 (b) KING, LIONEL, MIKE, ROMEO
 (c) KILO, LIMA, MARY, ROBERT.
 (d) KING, LIONEL, MARY, ROBERT

Answers for 1997-Nov

Basic Electronic

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

Licencing conditions.....

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