EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENY ISSUED
BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS, SRI LANKA – 2002
(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. A 10mA current is measured in a 100 Ohm resistor. The voltage across the resistor will be,
   (a) 0.001 V (b) 0.01 V (c) 0.1 V (d) 1 V

2. A current of 200 mA flows through a lamp of 25 Ohm resistance. The voltage across the lamp is,
   (a) 5 V (b) 50 V (c) 500 V (d) 750 V

3. Two resistors are connected in parallel and are connected across a 40 V battery. If each resistor is 1000 Ohms, the total battery current is,
   (a) 40 A (b) 40 mA (c) 80 A (d) 80 mA

4. The following two quantities should be multiplied together to find power
   (a) resistance and capacitance (b) voltage and current
   (c) voltage and inductance (d) inductance and capacitance

5. The unit of the power is the
   (a) Ohm (b) Watt (c) Ampere (d) Volt

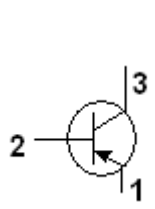
6. Three 15 picofarad capacitors are wired in parallel. The value of the combination is
   (a) 45 pF. (b) 18 pF. (c) 12pF. (d) 5 pF.

7. An inductor and a capacitor are connected in parallel. At the resonance frequency the resulting impedance is
   (a) maximum. (b) minimum. (c) totally reactive. (d) totally inductive.

8. In a forward bias pn junction, the electrons,
   (a) flow from p to n (b) flow from n to p
   (c) remain in n region (d) remain in the p region

9. A varactor diode acts like a variable,
   (a) resistance. (b) voltage regulator. (c) capacitance. (d) inductance.

10. In the figure shown, 3 represents the,
    (a) Collector of npn transistor
    (b) Collector of pnp transistor
    (c) Drain of a junction FET
    (d) Gate of a junction FET



11. The following meter could be used to measure the power supply current drawn by a small transistorized receiver.
    (a) A power meter (b) An RF ammeter.
    (c) A DC ammeter. (d) An electrostatic voltmeter

12. An attenuator network has 10 V rms applied to it's input with 1 V rms measured at its output. The attenuation of the network is ,
    (a) 6 dB (b) 10 dB (c) 20 dB (d) 40 dB

13. An AGC circuit in a receiver usually controls the
    (a) audio stage (b) mixer stage (c) power supply (d) RF and IF stages

14. Incoming signal to a superhet receiver is of 3540 kHz. Local oscillator produce a signal of 3995 kHz. The IF is tuned to
    (a) 455 kHz (b) 3540 kHz (c) 3995 kHz (d) 7435 kHz

15. The following unit is used to perform rectifying operation,
    (a) A capacitor. (b) a fuse.
    (c) resistor. (d) full wave diode bridge.

16. The polarization of a radio wave is defined by the direction of,
    (a) H field (b) E field (c) receiving antenna (d) Propagation.

17. The designed output impedance of the antenna socket of most modern transmitter is normally.
    (a) 25 Ohm (b) 50 Ohm (c) 75 Ohm (d) 100 Ohm

18. The portion of HF radiation which is directly affected by the surface of the earth is called,
    (a) ionospheric wave (b) local field wave
    (c) ground wave (d) Inverted wave

19. Radio wave energy on frequencies below 4 MHz. during daylight hours is almost completely absorbed by ionospheric
    (a) C layer (b) D layer (c) E layer (d) F layer

20. Changes in received signal strength when sky wave propagation is used are called,
    (a) diffraction loss (b) modulation loss
    (c) fading (d) sunspot

21. A power amplifier requires 30 mA at 300 V. The DC input power is,
    (a) 300 W (b) 9000 W (c) 9 W (d) 6 W

22. One megahertz is equal to
    (a) 0.0001 Hz. (b) 100kHz. (c) 10000 kHz. (d) 10 Hz

23. The reactance of an inductor, increases as the
    (a) frequency increases . (b) frequency decreases.
    (c) applied voltage increases. (d) applied voltage decreases.

24. Power factor is given by
    (a) $(1-\cos \phi)$ (b) $\cos (2\pi f)$ (c) $\cos \phi$ (d) $\sin (2\pi f)$

25. The current through an inductor,
    (a) can change suddenly. (b) cannot change suddenly.
    (c) is always zero. (d) is never zero.

26. The unit of E field strength is
    (a) Ohm (b) Henry (c) Volts/meter (d) Ampere/meter

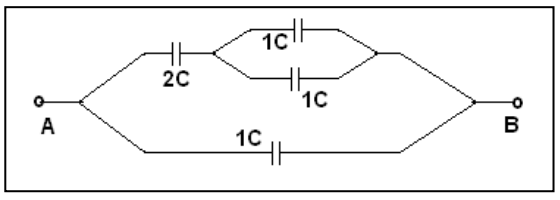
27. Which of the following layers tend to combine into a single layer at night ?
    (a) F_1, F_2 (b) D, F (c) E, F_2 (d) E, F_1

28. A moving coil meter by itself only responds to
    (a) Power. (b) Electric field. (c) AC. (d) DC.

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

30. The effective capacitance between A and B in the circuit shown

    (a) 0.1 C
    (b) 0.5 C
    (c) 1 C
    (d) 2 C



31. A receiver with high selectivity has a
    (a) wide bandwidth. (b) wide tuning range.
    (c) narrow bandwidth. (d) narrow tuning range.

32. A half-wave antenna resonant at 7100 kHz is approximately this length
    (a) 20 meters. (b) 40 meters. (c) 80 meters. (d) 160 meters.

33. The effect of adding a series inductance to an antenna is to
    (a) increase the resonant frequency. (b) have no change.
    (c) have little effect. (d) decrease the resonant frequency.

34. A half-wave dipole antenna is normally fed at the point of,
    (a) maximum voltage. (b) maximum current
    (c) maximum resistance (d) resonance.

35. A frequency range of the “70 centimeter” band is
    (a) 430 to 440 MHz. (b) 430 to 450 MHz.
    (c) 435 to 438 MHz. (d) 430 to 460 MHz.

36. The “S meter” on a receiver
    (a) indicates where the squelch control should be set.
    (b) indicates the standing wave ratio.
    (c) indicates the state of battery voltage.
    (d) indicates relative incoming signal strength.

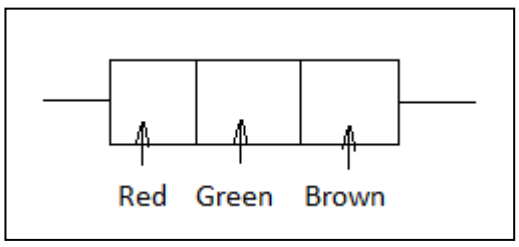
37. The term “PTT” means
    (a) Push to talk. (b) Piezo-electric transducer transistor.
    (c) Phase testing terminal. (d) Phased transmission transponder.

38. An amateur radio transmitter, antenna system has an ERP of 100 W. If the antenna gain is 10 dB, transmitter out put power is
    (a) 1W (b) 10 W (c) 100 W (d) 1000 W

39. A power gain of 2 is equivalent to
    (a) 3 dB. (b) 6 dB. (c) 10 dB. (d) 16 dB.

40. For best reception, the S/N ratio should be
    (a) zero . (b) high. (c) low. (d) none of the above.

41. The value of the resistor
    (a) 160Ω
    (b) 260Ω
    (c) 150Ω
    (d) 250Ω



42. The frequency range 300 kHz to 30 Mhz; includes
    (a) UHF, VHF ranges. (b) HF, VHF ranges (c) MF, HF ranges (d) LF, MF ranges

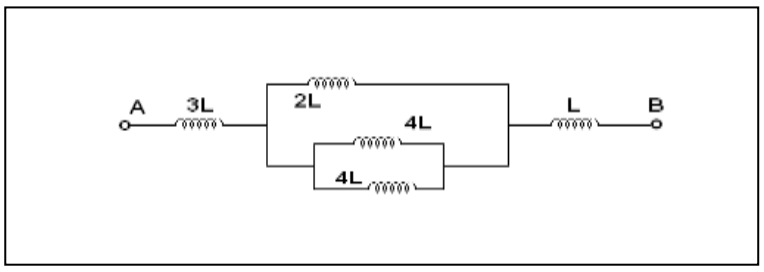
43. In a class B amplifier with a sinusoidal input signal the output current flows for a
    (a) full cycle (b) Half cycle (c) Quarter cycle (d) ¾ of cycle

44. The reflection coefficient of an open circuited transmission line is
    (a) infinites (b) -1 (c) zero (d) +1

45. A dc voltmeter can be used to measure
    (a) Power (b) Polarity (c) Power factor (d) RMS value

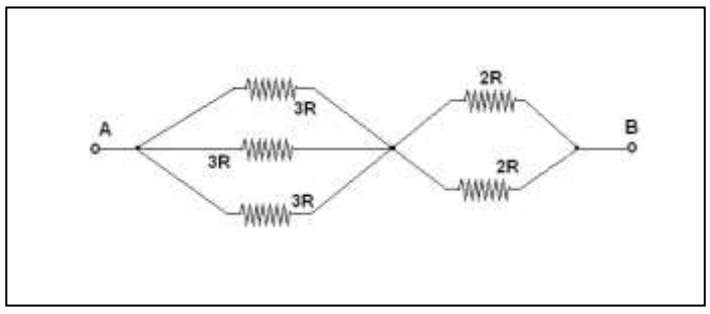
46. The total inductance between A and B in the circuit shown is

(a) 1L
(b) 2L
(c) 5L
(d) 10L



47. The total resistance between A and B is the circuit shown is,

(a) R
(b) 2R
(c) 3R
(d) 5R



48. Power advantage of SSB over AM is

(a) 4 : 1 (b) 3 : 1 (c) 3 : 4 (d) 4 : 3

49. A beat frequency oscillator (BFO) is used in the demodulation of

(a) AM signals. (b) FM signals (c) SSB signals. (d) PM signals.

50. The accuracy of digital frequency meter (DFM) depends on the accuracy of

(a) the gate (b) the clock (c) counter (d) none of these.

RAE-2002
General Class
Fundamentals of Electricity and Radio Communication
Answers

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

22. answer is 1000 kHz

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Licensing Conditions, Operating Practices and Procedures

One hour

Answer all questions on this paper itself. **Index No:-……..**
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1. The callsign prefix for general class is
   (a) 9M2 (b) 4S7 (c) 4S6 (d) 4S5

2. For general class amateur licence, maximum rated peak envelop output power from final stage for J3E emission shall not exceed
   (a) 1 W (b) 10 W (c) 50 W (d) 100 W

3. The callsign shall be transmitted at the beginning and end of each transmission. In case of transmissions of longer durations, the callsign shall be transmitted once in every
   (a) 2 minutes (b) 5 minutes (c) 10 minutes (d) 15 minutes

4. The correct phonetic alphabet for the word "TRC" is
   (a) Tonga, Romeo, Charlie (b) Tango, Romeo, Charlie
   (c)Tonga, Red, Charlie (d) Tango, Red, Charlse

5. If a station operated by another person who does not hold a valid licence, other than the licensee, it should be
   (a) only by Morse code
   (b) only by voice, under the supervision of the licensee.
   (c) with special permission of the Director General of Communication
   (d) outside of the amateur band.

6. A person who holds a licence to operate an amateur radio station may,
   (a) use international distress signal "SOS" or "MAYDAY".
   (b) transmit the words of a third party which have been publicly spoken.
   (c) emit misleading signals or callsigns.
   (d) exchange messages with unlicensed radio station.

7. A person who holds a licence to operate an amateur radio station shall not operate continuously for periods exceeding
   (a) 1 minute (b) 2 minutes (c) 5 minutes (d) 10 minutes

8.Emission of an unmodulated or unkeyed carrier is
   (a) permitted for long durations for testing purposes.
   (b) permitted for long durations for tuning purposes.
   (c) permitted for short durations for testing or tuning purposes.
   (d) never allowed.

9. The abbreviation for "Are you been interfered with ?"
   (a) QRK (b) QRM (c) QRG (d) QTH

10. The correct phonetic alphabet for word "BAD"
   (a) Bravo, Alpha, Delta. (b) Bravo, Alpha, Down.
   (c) Bravo, Andrew, Delta (d) Brown, Alpha, Delta.

11. CQ should only be made
   (a) after listening to a frequency which is not in use.
   (b) on frequencies that are in use.
   (c) when contests are on.
   (d) when band conditions are hopeless.

12. If the readability is given as 3 the signal is
   (a) perfectly readable. (b) readable with considerable difficulty.
   (c) unreadable. (d) barely readable, occasional words distinguishable.

13. If the signal strength is given as 9, it is a
    (a) faint signal (b) fair signal (c) strong signal (d) extremely strong signal

14. When calling an amateur station it is a good procedure to
    (a) transmit your callsign first and the called station last.
    (b) transmit the callsign of the station being called first and the calling station last.
    (c) transmit your callsign only.
    (d) transmit the callsign of the station being called only.

15. Using voice modulation F3E corresponds to
    (a) FM (b) PM (c) DSB (d) SSB

16. In the emission designation the second symbol indicates
    (a) type of modulation. (b) nature of modulating signal.
    (c) bandwidth. (d) type of information.

17. Q-code abbreviation "QRG" means
    (a) Are you busy (b) What is your location
    (c) Will you tell me my exact frequency (d) What is the correct time

18. Which of the following are to be inspected by an officer under the authority of the Director General of Telecommunication ?
    (a) Station, logbook and licence. (b) Station and log book only.
    (c) Log book and licence only (d) None of the above.

19. For General class amateur licence, maximum mean output power in HF bands is,
    (a) 1 W (b) 5 W (c) 10 W (d) 50 W

20. Amateur radio equipment cannot be used for
    (a) intercommunication (b) transmitting news.
    (c) self training (d) testing

21. Station logbook may not indicate
    (a) date, month and year of the emission. (b) name of the operator.
    (c) the callsign of the called station (d) the class of emission.

22. A transmitter has a power output of 100 W. This is connected to an antenna of 3 dB gain. The ERP is
    (a) 100 W (b) 200 W (c) 500 W (d) 1000 W

23. The phrase "you are fully quieting the repeater" means:
    (a) Your signal is too weak for the repeater to reproduce correctly.
    (b) Your signal into the repeater is strong enough to be noise free on the output frequency.
    (c) Your modulation level is too low.
    (d) You are speaking too quietly into the microphone.

24. The "S meter" on a receiver
    (a) indicates where the squelch control should be set.
    (b) indicates the standing wave ratio.
    (c) indicates the state of the battery voltage.
    (d) indicates the relative incoming signal strength.

25. The Q signal "are you busy ?" is
    (a) QRM ? (b) QRL ? (c) QRT ? (d) QRZ ?

****

Answers

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

Q-2 maximum rated peak envelop output power = 500W (earlier it was 100W)

Q-19 answer is 500 W (earlier 100W)