Department of Examinations, Sri Lanka

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICENCY ISSUED BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKA – (1998)
(NOVICE CLASS)
Basic Electricity, Radio and Electronics Theory

Two hours

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

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

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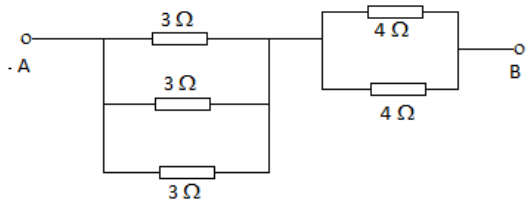
1. Farad is a unit of
   (a) Resistance (b) Inductance (c) Capacitance. (d) Frequency.

2. The rms value of 230V, 50Hz main supply is
   (a) 230V (b) 230√2 V (c) 2x230V (d) 230√2 V

3. 0.1 pF capacitance is equivalent to
   (a) $1x10^{-12}$ F (b) $1x10^{-13}$ F (c) $1x10^{-9}$ F (d) $1x10^{-10}$ F

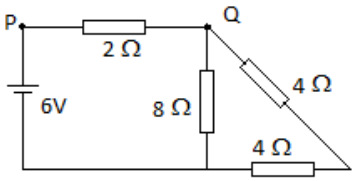
4. The length of a current carrying conductor is halved, the resistance will became
   (a) half. (b) double. (c) one fourth. (d) same.

5. The effective resistance between A and B in the circuit shown is
   (a) 1 Ω
   (b) 2Ω
   (c) 3Ω
   (d) 4Ω



6. The unit of frequency is
   (a) Hertz. (b) Volt. (c) Ampere. (d) Ampere meter.

7. What is the magnitude of the current flowing through PQ in the given circuit?
   (a) 1A. (b) 2A.
   (c) 3A. (d) 4A.



8. The prefix "micro" is equivalent to
   (a) 10^{-3} (b) 10^{-6}
   (c) 10^{3} (d) 10^{6}

9. A 100Ω resistor dissipates a power of 1W. The current flowing across the resistor is

(a) 0.01A (b) 0.1A (c) 1A (d) 10A

10. The input power of a transmitter running at 48V, 2A is

(a) 24W (b) 48W (c) 96W (d) 192W

11. The frequency range from 3MHz to 30MHz is generally referred to as

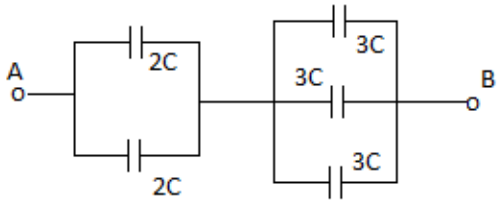
(a) low frequency. (b) high frequency.

(c) very high frequency. (d) ultra high frequency.

12. What is the total capacitance between the points A and B?

(a) C/2 (b) C

(c) 13C/36 (d) 36C/13



13. The reactance of a 2mH smoothing choke at a frequency of 50Hz is

(a) $1x10^{-1}\pi$ Ω (b) $2x10^{-2}\pi$ Ω (c) $4x10^{-1}\pi$ Ω (d) $2x10^{-1}\pi$ Ω

14. A half wave antenna is resonant at 60MHz. Its approximate length will be

(a) 2.5m (b) 5m (c) 10m (d) 20m

15. The output signal of a balanced modulator is

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

16. In the ionosphere , the lowest layer is known as

(a) D layer (b) E layer (c) F_1 layer (d) F_2 layer

17. The energy stored in an inductor L is given by

(a) LI/2 (b) LV/2 (c) $LI^2/2$ (d) LIV/2

18. The radiation resistance of a dipole antenna is

(a) 50Ω (b) 75Ω (c) 150Ω (d) 300Ω

19. The wavelength of a signal at 100MHz in free space is

(a) 0.3m (b) 3m (c) 10m (d) 20m

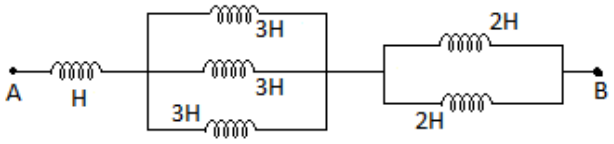
20. Envelop or diode detector is used for the detection of

(a) AM signals.

(b) FM signals. (c) SSB signals. (d) CW signals.

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

(a) H (b) 2H (c) 3H (d) 4H



22.A varactor diode acts as a variable

(a) resistance (b) inductance (c) capacitance (d) none of the above

23. Over modulation occurs when the modulation index (m) is such that

(a) m = 0 (b) m=1 (c) m < 1 (d) m > 1

24. The magnification factor of a parallel (LRC) circuit is given by

(a) Q = ωL/R (b) Q = ωLR (c) Q = ωC/L (d) ωL/C

25. A transformer is laminated to

(a) reduce hysteresis losses. (b) increasing exciting current.

(c) reduce eddy current losses. (d) increasing magnetic flux.

26. The electric field of an antenna is perpendicular to the earth's surface. The polarization of the antenna is

(a) horizontal. (b) vertical (c) circular. (d) none of the above.

27. An antenna whose input impedance is 75Ω should have a feeder link with an impedance of

(a) 50Ω (b) 75Ω (c) 150Ω (d) 300Ω

28. The resonant frequency of a tuned (LRC) circuit is given by

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

29. The magnification factor of a series (LRC) circuit is given by

(a) $Q = \frac{\omega L}{R}$ (b) $Q = \frac{\omega C}{L}$ (c) $Q = \frac{\omega L}{C}$ (d) $Q = \omega L R$

30. 27.3MHz is the third harmonic of

(a) 9.1MHz (b) 13.65MHz (c) 54.6MHz (d) 81.9MHz

31. 0.1microhenry inductance is equivalent to

(a) $1x10^{-5}$ (b) $1x10^{-6}$ (c) $1x10^{-7}$ (d) $1x10^{-8}$

32. When 4V emf is applied across 1F capacitor, the energy stored in the capacitor is

(a) 2J (b) 4J (c) 8J (d) 16J

33. A transformer is used to change the value of

(a) voltage. (b) power. (c) frequency. (d) none of these.

34 The symbol shown indicates a 

(a) diode. (b) pnp transistor. (c) npn transistor. (d) Zener diode.

35. To measure the voltage of a circuit , a voltmeter must be connected in

(a) series with the circuit. (b) parallel with the circuit.

(c) either series or parallel with the circuit. (d) none of the above.

36. The megger is used for

(a) measuring current. (b) measuring voltage. (c) measuring power. (d) testing insulation.

37. The automatic gain control (AGC) circuit is usually used to control the gain of the

(a) mixer. (b) detector. (c) audio amplifier. (d) IF amplifier.

38. The purpose of adding reflectors and a director to a folded dipole antenna is to

(a) increase its impedance. (b) decrease its impedance.

(c) make it unbalanced (d) none of the above.

39. The moving coil instrument can be used to measure

(a) dc values only. (b) ac values only.

(c) both dc and ac values. (d) none of the above.

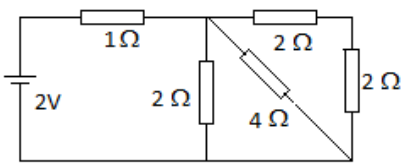
40. As the frequency increases, the reactance of an inductor

(a) decreases. (b) increases. (c) stays constant. (d) none of the above.

41. The power dissipation of the 1Ω resistor of the circuit shown is

(a) 250mW (b) 500mW

(c) 1W (d) 2W



42. The total power content of an AM signal is 100W and the percent modulation is 100%. The power transmitted by the carrier is

(a) 33.33W (b) 66.67W (c) 16.66W (d) 100W

43. When antenna length is halved the resonant frequency

(a) becomes half. (b) becomes double. (c) remains constant. (d) none of the above.

44. In the series RLC circuit at resonance the impedance is

(a) zero. (b) minimum. (c) maximum. (d) infinity

45. The ionosphere layer which has a greatest effect on a radio signal is

(a) D layer. (b) E layer. (c) F layer. (d) none of these layers.

46. What is the characteristic impedance of a transmission line which has a capacitance of 50 pF/m and an inductance of 0.5 µH/m?

(a) 10Ω (b) 100Ω (c) 500Ω (d) 50Ω

47. A coil has a resistance of 5Ω and a reactance of 12Ω. The impedance is

(a) 7Ω (b) 12Ω (c) 13Ω (d) 17Ω

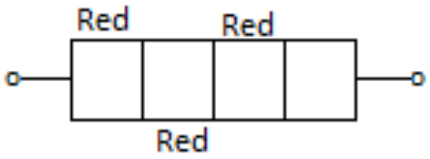
48. The ratio detector is used for the detection of

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

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

(a) 22Ω (b) 33Ω

(c) 2200Ω (d) 3300Ω



50. The basic concept of FM is to vary the

(a) amplitude of the carrier signal.

(b) amplitude of the modulating sinal.

(c) frequency of the carrier signal.

(d) frequency of the modulating signal.

Answers for 1998

Basic Electronic ….

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

Q-24 No correct answer. Answer is ”R/ωL” or “ωCR”

Q-31 Unit is not mentioned for answers. Al four answers should be in Henrys.

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EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICENCY ISSUED BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKA – (1998)
(NOVICE CLASS)
Licencing Conditions, Operating Practices and Procedures

One hour

***Index No* :……**

Answer al l questions on this paper itself.
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1. Q code abbreviation "QRH" means
   (a) What is the readability of my signal? (b) What is the tone of my transmission?
   (c) Will you tell me my exact frequency. (d) Does my frequency vary?

2. Q code abbreviation "QSB" means
   (a) Is my keying defective? (b) Are my signals fading?
   (c) Are you being interfered with? (d) Are you troubled by static?

3. Q code abbreviation "QSL" means
   (a) Can you give me acknowledgment of receipt (b) What is the strength of my signal?
   (c) Shall I change to another frequency? (d) Shall I send each word more than once?

4. Q code abbreviation "QTR" means
   (a) shall I send more slowly? (b) Shall I stop sending?
   (c) What is the correct time? (d) What is your location?

5. "Decrease power" is given by Q code
   (a) QRM (b) QRN (c) QRO (d) QRP

6. Send more slowly" is given by Q code
   (a) QRQ (b) QRS (c) QRT (d) QRU

7. "I am ready" is given by Q code
   (a) QSV (b) QSY (c) QRU (d) QRV

8. Using voice modulation H3E correspond to
   (a) SSB with suppress carrier. (b) FM
   (c) SSB with full carrier. (d) DSB

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

10. Using voice transmission A3E corresponds to
    (a) SSB (b) DSB (c) FM (d) PM

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

12. Abbreviation for "invitation to a any station to transmit" is
    (a) KA (b) KN (c) K (d) AS

13. Abbreviation for "end of message" is
    (a) VA (b) KA (c) AS (d) AR

14. Which of the following types of messages can be transmitted over amateur radio?
    (a) Messages for a pecuniary reward. (b) Messages for a religious nature.
    (c) Messages on behalf of a third party. (d) Those of personal affairs.

15. The amateur radio equipment cannot be used for
    (a) transmitting advertisements (b) technical investigations.
    (c) intercommunications. (d) self training.

16. In amateur transmission it is not permissible to use
    (a) plain languages (b) phonetic alphabet (c) secret code (d) Q-code

17. Which of the following need not to be entered in the station log book.
    (a) Call sign of calling station (b) Call sign of the called station
    (c) Station operated at a temporary location (d) transmitter power

18. Which of the following represents a valid amateur station log?
    (a) In an exercise book (b) On a magnetic tape
    (c) On any electronic storage media (d) All the above are correct

19. Before initiating a CQ call
    (a) keep giving your call sign (b) listen on the frequency
    (c) send a series of Vs (d) All the above are correct.

20. Classes of emissions are designated by group of minimum of three characters. The third character
    (a) type of modulation of the main carrier.
    (b) nature of signal(s) which is used to modulate the main carrier.
    (c) type of information to be transmitted.
    (d) none of the above.

21. In the RST code T is for
    (a) time of transmission. (b) transmitter power.
    (c) temperature of PA stage. (d) tone.

22. During transmission, amateur stations are required to transmit their call sign at intervals of not Exceeding

(a) 7 minutes (b) 5 minutes (c) 3 minutes (d) 2 minutes

23. Telegraphy by on-off keying of an amplitude modulated audio frequency for automatic reception by

(a) A1B (b) A1A (c) A2B (d) A2A

24. The correct phonetic alphabet for the word "GOLD" is

(a) Georg, Oscar, Lima , Delta (b) Golf, Oscar, Lima, David

(c) Golf, Oscar, Lima, Delta (d) Golf, Oliver, Lima, David

25. The correct group using the international phonetic alphabet is

(a) Alpha , Marry, Sarah, York (b) Alpha, Mary, Sierra, York

(c) Alpha, Mike, Sarah, Yankee (d) Alpha, Mike, Sierra, Yankee

Answers for 1998

Licencing conditions…..

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