EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICENCY ISSUED
BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKA – (2001)
(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.*

1. Henry is a measuring unit of
    (a) resistance.   (b) capacitance.   (c) inductance.   (d) frequency.

2. The average value of a sine wave is
    (a) half peak value   (b) full peak value.   (c) one.   (d) zero.

3. The symbol shown in the figure indicates a
    (a) transformer.   (b) coil.   (c) resistor.   (d) capacitor.

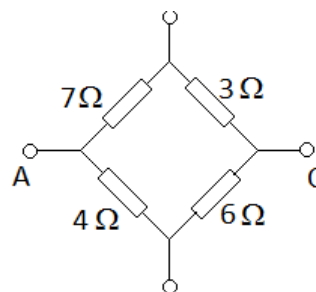4. A coil has a resistance of $0.3\ \Omega$ and a reactance of 0.4Ω. The effective impedance is
    (a) $0.3\ \Omega$ (b) 0.4Ω (c) 0.5Ω (d) $0.7\ \Omega$

5. The number of coils in the single phase transformer
    (a) one.   (b) two.   (c) three   (d) four

6. The effective resistance between A and C in the figure is
    (a) $20\ \Omega$
    (b) $10\ \Omega$
    (c) $5\ \Omega$
    (d) 0

7. The prefix 'pico' is equivalent to
    (a) 10^{-12} (b) 10^{-9} (c) 10^{-6} (d) 10^{-3}

8. The power dissipated in the resistor R, when current I flows through it
    (a) $I^2 R$.   (b) $I R^2$.   (c) $I R$.   (d) $V^2 R$.

9. A current of 50 mA flows through a resistor of 1.5 kΩ. What is the voltage across the resistor?
   (a) 240 V   (b) 100 V   (c) 75 V   (d) 50 V

10. Resistors of 100Ω and 150Ω are connected in parallel. Find effective resistance
   (a) 250Ω   (b) 150Ω   (c) 100Ω   (d) 60Ω

11. Diode bridge is used to
   (a) convert AC to DC.   (b) convert DC to AC.   (c) increase voltage.   (d) increase current.

12. 'Simplex' is called
   (a) wire communication.   (b) wireless communication.
   (c) one-way communication.   (d) two-way communication.

13. 20dB voltage gain is an increased by
   (a) 20.   (b) 15.   (c) 10.   (d) 5.

14. The circuit shown in figure is
   (a) low pass filter.
   (b) high-pass filter.
   (c) simple DC circuit.
   (d) simple AC circuit.
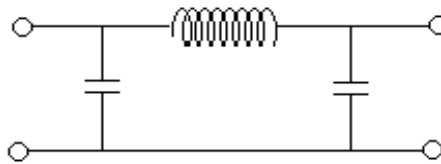
15. Generally the value of a component increases as the
   (a) temperature increases.   (b) temperature decreases.
   (c) temperature been constant.   (d) none of these.

16. The frequency above 1GHz is generally referred to as
   (a) high frequency.   (b) very high frequency.
   (c) ultra high frequency.   (d) micro wave.

17. An electric field associated with the transmitted signal is due to
   (a) voltage change.   (b) current change.
   (c) frequency change.   (d) none of these.

18. The value of a resistor is 120 Ω, the corresponding color codes will be
   (a) brown, red, brown.   (b) brown, red, red.
   (c) brown, red, black.   (d) black, red, brown.

19. The lowest layer is in the ionosphere
   (a) D.   (b) F_1 (c) F_2 (d) E

20. A 2A current carrying coil has a resistance of 0.5Ω power dissipated in it is
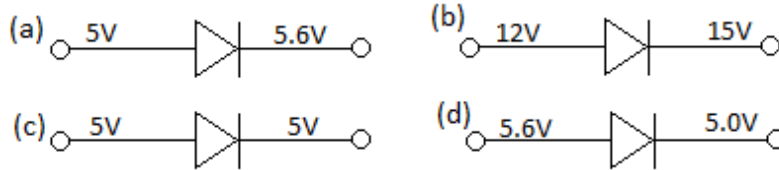   (a) 20W.   (b) 2W.   (c) 0.5W   (d) 0.25W

21. Generally dummy loads are made by
     (a) none-reactive resistors.   (b) reactive resistor.   (c) copper.   (d) clay.

22. A varactor diode act like a
     (a) variable inductor.   (b) variable resistor.   (c) variable capacitor.   (d) variable regulator.

23. In the following diagram, which represents the diode in conducting condition.

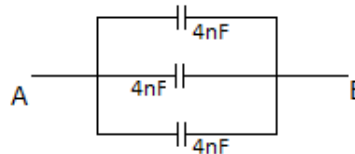

24. As the frequency rises, the reactance of an inductor

     (a) stay constant.   (b) decreases.   (c) increases.   (d) does none of these.

25. Two 10kΩ resistors are connected in parallel across a 5V DC supply. The total current taken is
     (a) 50 μA.   (b) 0.5mA.   (c) 1mA.   (d) 1A

26. What is the effective capacitance between A and B shown in figure?
     (a) 2nF
     (b) 12 nF
     (c) 22 nF
     (d) 48 nF

27. What is the effective inductance between X and Y shown in figure?
     (a) 2μH   (b) 4μH
     (c) 12μH   (d) 16μH
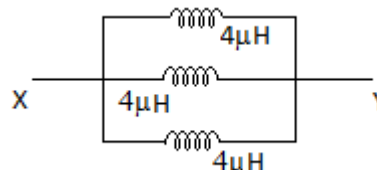
28. In the equation $V = f\lambda$, λ denotes
     (a) velocity.   (b) frequency.   (c) wave length.   (d) time.

29. Ohm's law says
     (a) $R = V/I$ (b) $I = V/R$ (c) $V = IR$ (d) all the above are correct

30. LED is a
     (a) transistor   (b) diode   (c) capacitor   (d) inductor

31. The minimum impedance is given in a RLC circuit at
    (a) high voltage.　　　(b) resonance.　　　(c) high current.　　　(d) high frequency.

32. Zener diodes are used in
    (a) power supplies.　　(b) modulator.　　　(c) demodulator.　　　(d) low pass filter.

33. SWR of a perfectly matched system
    (a) 1 to 1.　　　　　　(b) 1 to 2.　　　　　(c) 2 to 1　　　　　　(d) none of these.

34. Copper and Aluminium are most widely used to make
    (a) diodes.　　　　　(b) insulators.　　　(c) transistors.　　　(d) conductors.

35. The velocity of radio wave in free space is
    (a) increasing with frequency.　　　　(b) decreasing with frequency.
    (c) constant.　　　　　　　　　　　(d) none of these.

36. The energy stored at 0.5H inductor, when 5A current flowing through it
    (a) 0.1W .　　　　　(b) 6.25W .　　　　(c) 10 W .　　(d) 12.5 W .

37. The ability of a receiver to pick up weak signals is
    (a) selectivity.　　　(b) sensitivity.　　　(c) stability.　　(d) screening.

38. The wave length of a signal is 3m. It's frequency at free space is
    (a) 50 Hz.　　　　　(b) 50 MHz.　　　　(c) 100 Hz.　　(d) 100 MHz.

39. For a constant DC voltage capacitor act as a
    (a) open circuit.　　　(b) short circuit.　　　(c) diode.　　　(d) transistor.

40. A resistor dissipates 2W at 10V, value of the resistor is
    (a) 100Ω　　　　　　(b) 50 Ω　　　　　(c) 25Ω　　　　　(d) 10Ω

41. The terminals of a Field Effect Transistor (FET) are
    (a) Base, Collector, Emitter.　　　　(b) Gate, Drain, Source.
    (c) Base, Collector, Source.　　　　(d) Gate, Drain, Emitter.

42. Unijunction transistor is known as
    (a) Bipolar transistor　　　　　　(b) Thyristor.
    (c) Field Effect Transistor.　　　　(d) none of these.

43. What emission mode describes SSB speech transmission?
    (a) J3E　　　　　　(b) F3E　　　　　(c) A3E　　　　　(d) F3E

44. What is the instrument used for testing insulation?
    (a) Voltmeter.　　　(b) Ammeter.　　　(c) Megger.　　　(d) Power meter.

45. What value of a resistor is required to drop 150V , when current flowing through it is 25mA.
    (a) 6000Ω   (b) 600Ω   (c) 60Ω   (d) 6Ω

46. A smoothing choke has an inductance of 0.2H. Its reactance at a frequency of 100Hz is
    approximately
    (a) 40Ω   (b) 125Ω   (c) 400Ω   (d) 1250Ω

47. A $\lambda/2$ dipole has a length of just under 7.5m It will be resonant at a frequency
    (a) 30 MHz.   (b) 25MHz.   (c) 20 MHz.   (d) 15MHz.

48. The dip meter is using for
    (a) frequency measurement.   (b) voltage measurement.
    (c) current measurement.   (d) none of these.

49. Frequency shift keying is used mostly in
    (a) telegraphy.   (b) voice telephone.
    (c) wireless transmission.   (d) wire transmission.

50. Volt/meter equales
    (a) $Newton^2$ / Coulomb   (b) Newtons . Coulomb
    (c) Newtons / Coulomb   (d) Newtons / $Coulomb^2$

Answers for 2001
Basic Electronic ....

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

Q-4 $Z^2 = X^2 + R^2$

Q-5   Normally two coils but it can be any number

Q-7 10^{-9} is "nano" , 10^{-6} is "micro" , 10^{-3} is "milli"

Q-12 normally use the word "simplex" is two way communication in a same channel.

      For data transmission:- "simplex operation" is one way transmission (ARRL-HB)

Q-13 for voltage gain, dB = 20 Log(V_1/V_2)

Q-15 There are 100s of various components. But all of them are not behave same way.

Q-16 HF = 3MHz - 30MHz, VHF = 30MHz – 300MHz, UHF = 300MHZ – 3GHz,

      SHF = 3GHz – 30 GHz, EHF = 30GHz – 300GHz, μ-wave = SHF & EHF

Q-23 This is correct, only if it is a Germanium diode.

      If it is a Silicon diode 0.6V is not enough. It should be 0.7V or higher.

Q-24 use the formula $X_L = 2\pi fL$

Q-27 Correct answer is 1.33μH. Answer is not there.

Q-31 Question is incomplete.

      For series RLC circuit, impedance is minimum at resonance, for parallel circuit it is maximum.

Q-35 Velocity of electro magnetic wave in free space = 3×10^8 km/s. it is low in other mediums.

Q-36 Actually no correct answer. Because answer is 6.25 Jule (not Watt), $E = 0.5 \, L \, I^2$

Q-46 $X_L = 2 \pi f L$

Q-47 use c = f λ or 300 = MHz x m

Q-50 for capacitor, E = QV/2 and Energy = Newton . meter, or E = N . m

      Therefore Q . V = N . m, V/m = N/Q

      Therefore Volt / meter = Newtons / Choulomb

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICENCY ISSUED
BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKA – (2001)
(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. Pick out the correct answer and **underline** it.*

1. An Amateur licence requires, minimum
   (a) a pass in the RAE and Morse test.   (b) a pass in the RAE only.
   (c) a pass in the Morse test only.   (d) applicants must be over 14 years of age.

2. As well as amateur frequency transmission the licensee allows reception of
   (a) diplomatic messages.   (b) standard frequency transmissions.
   (c) news agency transmissions.   (d) police transmissions

3. Before making a CQ call
   (a) listen on the frequency before commencing.   (b) send a series of Vs in Morse.
   (c) send a 1750Hz tone.   (d) keep giving your call sign.

4. Q-code abbreviation QRQ means
   (a) shall I send faster.   (b) shall I change power.
   (c) are you ready.   (d) are you troubled by static.

5. Q-code abbreviation QRL means
   (a) shall I change frequency.   (b) shall I send slowly.
   (c) are you busy.   (d) are you being interfered with.

6. Q-code abbreviation QSB means
   (a) reply in Morse.   (b) stop transmitting.
   (c) change frequency.   (d) there is fading.

7. Q-code abbreviation QSA means
   (a) What is the strength of my signal.   (b) what is your location.
   (c) What is the time.   (d) what is your position.

8. Abbreviation for "what is the correct time" is
   (a) QSY   (b) QSZ   (c) QTH   (d) QTR

9. Abbreviation for "How do you receive me" is
   (a) HR   (b) HW   (c) HT   (d) HF

10. The correct phonetic alphabet for the word "WIN" is
      (a) World, India, November   (b) Whisky, India, Noon
      (c) Whiskey, India, November   (d) Whiskey, Indonesia, November

11. The correct group using the international phonetic alphabet is
      (a) Echo, Golf, Zoo   (b) Echo, Gate, Zulu
      (c) Echo Gate Zulu   (d) Echo, Golf, Zulu

12. In amateur transmission it is not permissible to use
      (a) Plain language.   (b) Morse code.   (c) Q-code   (d) secret code.

13. The Novice Class B license does not authorize to use
      (a) below 30 MHz.   (b) above 30MHz.   (c) UHF.   (d) above GHz range.

14. Using speech transmission A3E corresponds to
      (a) SSB   (b) DSB   (c) FM   (d) DSSB

15. RST stands for
      (a) Readability, Safety, Tone   (b) Readability, Signal strength, Tone
      (c) Radio Transmitter, Safety, Tone   (d) Radio, Signal strength, Tone

16. Which of the following can be entered in the station log book?
      (a) Date   (b) Class of emission   (c) CQ call   (d) All the above are correct.

17. Abbreviation for closing station is
      (a) CM   (b) CL   (c) CQ   (d) AT

18. Transmitting a CQ is to
      (a) open station   (b) end of communication.
      (c) continue communication   (d) none of the above.

19. It is an offence to send by wireless telegraphy
      (a) test transmission.   (b) serve weather warning.
      (c) certain misleading messages.   (d) ASCII codes.

20. The band plans should be observed because
      (a) they are mandatory.   (b) they are governed by international regulations.
      (c) they are intended to aid operating.   (d) they are only for novices.

21. 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
      (b) put your call sign first.   (d) none of the above.

22. The purpose of a terrestrial repeater is to
    (a) increase satellite coverage.
    (b) increase the range of fixed stations.
    (c) minimise contacts by pedestrian stations.
    (d) increase the range of mobile stations.

23. Code and abbreviations may be used by the licensee as long as
    (a) they are specified only by the RSGB
    (b) they are in secret cypher.
    (c) Q-codes only are used.
    (d) they do not obscure the meaning of the communication.

24. Time in the log book must always be in
    (a) Local time.   (b) UTC.   (b) BST.   (d) UTC + 1 hour.

25. The only general call allowed from an amateur station is
    (a) a CQ call.   (b) a news bulletin.   (c) third party call.   (d) on VHF.

Answers for 2001
Licencing conditions…..

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

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

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

Q-3   1750 Hz is the standard AF tone for access VHF repeaters. Send a series of "V"s = QSV
Q-4   Pwr increase = QRO, Pwr decrease = QRP, Are you ready = QRV, trouble by static = QRN
Q-5   Change frequency = QSY, Send slowly = QRS, Interfered with static = QRN,
    Interfered with other stations = QRM
Q-6   Stop transmitting = QRT, Change frequency = QSY
Q-7   Location or correct position = QTH, Time = QTR,
Q-8   QSY = change freq. , QSZ = send each word more than once (not in Ham Radio), QTH = location,
Q-9   HR = here or hear , HT = high tension (high voltage), HF = high frequency.
Q-13   Novice class-B is not in the new regulations.
Q-14   Voice SSB = J3E, Voice FM = F3E , No meaning for DSSB
Q-17   CQ = General call for any station, No standard abbreviation of "CM" and "AT"
Q-21   same answer in (a) and (c)