

Department of Examination, Sri Lanka

Examination for the Issue of Amateur Radio Operators' License by the Telecommunications Regulatory Commissions of Sri Lanka (General Class License) - 2008

**(01) Fundamentals of Electricity & Radio Communications**

*Two hours*

*\*Answer all questions on this paper itself.*

*\*Pick out the correct answer **and underline** it.*

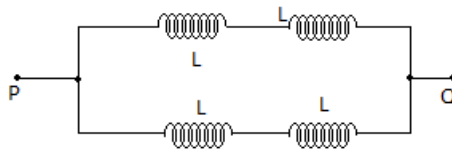
*\*A minimum of 50% marks is required for a pass.*

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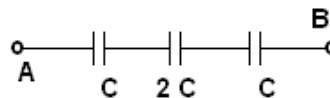
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1. The value of reactance of 30 H smoothing choke at a frequency of 50 Hz is  
(1)  $3\Omega$             (2)  $3\pi\Omega$             (3)  $3\text{ k}\Omega$             (4)  $3\pi\text{ k}\Omega$
  2. The impedance of a half wave dipole is about  
(1)  $50\Omega$             (2)  $73\Omega$             (3)  $93\Omega$             (4)  $150\Omega$
  3. The value of the wave length of a signal at 100 MHz in free space is  
(1) 3 cm            (2) 30 cm            (3) 3m            (4) 30 m
  4. The characteristic impedance a lossless transmission line is given by  
(1)  $Z = \sqrt{L/C}$     (2)  $Z = \sqrt{C/L}$     (3)  $Z = \sqrt{LC}$     (4)  $Z = L/C$
  5. The average value of a sine wave is  
(1) peak value  $\times \sqrt{2}$             (2) peak value  $/ \sqrt{2}$             (3) one            (4) zero
  6. The ability of a receiver to separate signals on different frequencies is known as  
(1) Sensitivity.    (2) Selectivity.    (3) Stability    (4) Screening.
  7. One way communication is called  
(1) monocomm    (2) simplex            (4) half duplex    (4) full duplex
  8. On a transmission line voltage Standing Wave Ratio (VSWR) is given by  
(1)  $V_{\max} / V_{\min}$     (2)  $V_{\max} * V_{\min}$     (3)  $V_{\min} / V_{\max}$     (4)  $\sqrt{(V_{\max} / V_{\min})}$
  9. A properly terminated transmission line has reflection coefficient of  
(1) 1            (2) 0.5            (3) zero            (4) infinity
  10. In the ionosphere the highest layer is  
(1) D            (2) E            (3)  $F_1$             (4)  $F_2$
  11. The power advantage of SSB over AM is  
(1) 2 : 1            (2) 3 : 1            (3) 3 : 2            (4) 4 : 3
  12. If out put power of a radio receiver is doubled it's volume is increased by  
(1) 1dB            (2) 2dB            (3) 3 dB            (4) 4 dB
  13. The quality factor of a series RLC circuit increases when the  
(1) impedance increases            (2) voltage increases  
(3) R decreases            (4) R increases
  14. Rectifier instruments indicate  
(1) dc value            (2) rms value            (3) peak value            (4) average value
  15. The Meggar is used for  
(1) measuring current            (2) measuring voltage  
(3) measuring power            (4) testing insulation
  16. A transmitter supplies 10 kw of carrier power to the antenna . The total radiated power with 40% modulation is  
(1) 10.8 kW            (2) 11.6 kW.            (3) 12 kW.            (4) 18 kW.

17. When bias applied to a varicap diode is increased, its capacitance  
 (1) remains constant. (2) is increased.  
 (3) is decreased. (4) first increases and then decreases.
18. When power ratios are expressed in dBm the reference power is  
 (1)  $1\mu\text{W}$  (2)  $1\text{ mW}$  (3)  $1\text{ W}$  (4)  $1\text{ kW}$
19. A device that changes one form of energy to another form is called  
 (1) an oscillator (2) a transistor (3) a transformer (4) a transducer
20. The charge on the plates of a capacitor is given by the expression  
 (1)  $Q = CV$  (2)  $Q = VI$  (3)  $Q = IR$  (4)  $Q = IC$
21. The power delivered to a loudspeaker of an amplifier is 30 dB above 10 mW. It is equivalent to  
 (1) 0.3 W (2) 3 W (3) 10 W (4) 30 W
22. Which of the following stays the same in all parts of a series circuit?  
 (1) Resistance (2) Current (3) Voltage (4) power
23. The resonance frequency of a tuned (LRC) circuit depends on  
 (1) L and C (2) L (3) C (4) R
24. Class C amplifiers are not in the following type of transmitters.  
 (1) CW (2) AM (3) SSB (4) FM
25. The magnification factor of a parallel circuit given by  
 (1)  $Q = WC/R$  (2)  $Q = WC/L$  (3)  $Q = WL/C$  (4)  $Q = WL/R$
26. One disadvantage of FM compared to AM is that it has  
 (1) lower frequency. (2) noise immunity.  
 (3) capture effect (4) excessive use of spectrum
27. Which of the following does the balanced modulator to eliminate from its output?  
 (1) Lower sideband (2) Upper sideband (3) Carrier (4) Both sidebands
28. The advantage of class A operation (of an amplifier) is  
 (1) low distortion (2) low power wastage (3) high efficiency (4) all of the above
29. Zener diodes are used in  
 (1) DC power supply (2) modulation (3) demodulator (4) frequency multiplier
30. An electrical circuit that has infinite resistance is called  
 (1) a short circuit (2) an open circuit (3) a ground circuit (4) either (1) or (3)
31. A dc voltmeter may be used directly to measure  
 (1) frequency (2) power (3) polarity (4) power factor
32. In any transformer the voltage per turn in primary and secondary are always  
 (1) different (2) the same (3) in a fixed ratio (4) none of these above
33. The instrument used for dc measurement only  
 (1) moving iron type (2) induction type  
 (3) electromagnetic type (4) permanent magnet type
34. The information in AM signal is conveyed in the  
 (1) sidebands (2) single sideband only  
 (3) carrier only (4) both carrier and sidebands
35. The ionosphere causes radio signals to be  
 (1) absorbed (2) diffused (3) refracted (4) reflected

36. The best frequency demodulator is the  
 (1) PLL discriminator (2) ratio detector  
 (3) pulse averaging. (4) Foster-Sealey discriminator
37. A transistor is basically an amplifying device for  
 (1) frequency (2) power (3) voltage (4) current
38. The horizontal radiation pattern of a horizontal dipole is a  
 (1) circle (2) figure 8 (3) narrow beam (4) clover leaf
39. The out put power of SSB transmitter is usually expressed in terms of  
 (1) peak to peak power (2) RMS power  
 (3) peak envelop power (4) average power
40. A varactor diode act as a variable  
 (1) capacitor (2) Inductance (3) resistance (4) voltage regulator
41. The transformer is use to change the value of  
 (1) power factor (2) power (3) frequency (4) voltage
42. As the frequency rises the reactance of an inductor  
 (1) increases (2) decreases (3) remains constant (4) none of the above
43. For constant dc voltage a capacitor act as a  
 (1) a finite resistor (2) a current source  
 (3) an open circuit (4) a short circuit
44. Induced emf is defined as  
 (1) rate of change of charge (2) rate of change of flux linkage  
 (3) rate of change of voltage (4) work done in moving unit charge
45. At resonance , in parallel tuned (RLC) circuit  
 (1) impedance is zero (2) impedance is minimum  
 (3) current is maximum (4) current is minimum
46. The high frequency range extend from  
 (1) 300Hz to 3MHz (2) 3 MHz to30 MHz  
 (3) 30 MHz to 300 MHz (4) 300 MHz to 3 GHz
47. In a class A amplifier with a sinusoidal input signal, the output current flows for  
 (1) less than half a circle (2) more than half a circle  
 (3) a full circle (4) a half circle



48. The inductance between P and Q in the circuit shown is  
 (1) L (2) 2L (3) 3L (4) 4L



49. The total capacitance between A and B in the circuit shown is  
 (1) 10C (2) 6C (3) 4C (4) C
50. What is the peak value of 240 V, 50 Hz mains supply ?  
 (1) 240 V (2)  $240\sqrt{2}$  V (3)  $240/\sqrt{2}$  V (4)  $(2/\pi) \times 240$  V

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

Q-11 no answer. Correct answer is 4:1

Q-17 When reverse bias applied to varicap diode and increase the reverse voltage C is decreasing.

Q-25 printing error "W" must print as "ω" and No answer. Answer is  $R/X$  or  $R/2\pi fL$  or  $2\pi fCR$  or  $R/\omega L$  or  $\omega CR$

Q-49 No answer. Correct answer is  $0.4C$  or  $2C/5$

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**(2) Licensing Conditions, Operating Practices and Procedures**

*One hours*

*\*Answer all questions on this paper itself.*

*\*Pick out the correct answer **and underline it.***

*\*A minimum of 50% marks is required for a pass.*

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1. Abbreviation for "we agree" (or it is correct) is  
(1) AA                      (2) AB                      (3) OK                      (4) CFM
  2. Q code abbreviation for QRG means  
(1) "Will you tell me my exact frequency?"                      (2) "Shall I increase power?"  
(3) "Who is calling me?"                      (4) "Dose my frequency vary?"
  3. Q code abbreviation for QTH means  
(1) "Who is calling me?"                      (2) "What is your location?"  
(3) "Shall I increase power?"                      (4) "Shall I stop sending?"
  4. "Are you busy?" is given by Q-code  
(1) QRT                      (2) QRL                      (3) QSO                      (4) QSZ
  5. Abbreviation "traffic" is given by  
(1) RPT                      (2) TFC                      (3) WA                      (4) NW
  6. Double side band is denoted by  
(1) A3E                      (2) F3E                      (3) R3E                      (4) J3E
  7. Resistor used to discharge a capacitor of high value are known as  
(1) short circuits                      (2) open circuits.                      (3) bleed resistors.                      (4) parallel resistors.
  8. Phase modulated data transmissions are known as  
(1) G0E                      (2) G3E                      (3) G1D                      (4) F3E
  9. Emission of an unmodulated or unkeyed carrier shall be permitted  
(1) any time  
(2) only for short time for any purpose.  
(3) tuning or testing purpose for a short time  
(4) not allowed
  10. Amateur station and other telecommunication installations  
(1) can be interconnected                      (2) cannot be interconnected  
(3) can be acoustically interconnected                      (4) can be optically interconnected
  11. Which one of the following users international phonetic alphabet?  
(1) Alpha, Golf, John                      (2) Alpha, Good, June  
(3) Alpha, Golf, June                      (4) Alpha, Golf, Juliet
  12. Radio communication between amateur stations shall be made in plain language. Plain language means  
(1) clearly spoken.  
(2) international amateur codes and abbreviations  
(3) any simple language  
(4) none of above
  13. In RST code R1 means  
(1) unreadable                      (2) readable                      (3) perfectly readable                      (4) strong signal

14. In RST code T1 means  
 (1) pure DC note (2) extremely strong signal  
 (3) strong signal (4) extremely rough hissing note
15. In RST code S6 means  
 (1) good signal (2) modulated note  
 (3) perfectly readable (4) strong signals.
16. Amateur abbreviation CFM means  
 (1) FM signal. (2) confirm (3) continuous (4) I have nothing to send
17. Amateur abbreviation for "word before" is given by  
 (1) AA (2) WB (3) WA (4) NW
18. Q code for "shall I send faster" is  
 (1) QRQ (2) QRS (3) QRT (4) QRV
19. Q code for "frequency" is  
 (1) QRG (2) QRL (3) QRM (4) QRO
20. Q code "high power" is  
 (1) QRA (2) QRO (3) QRP (4) QRX
21. Q code QSB means  
 (1) fading (2) standby (3) location (4) OK
22. International phonetic alphabet for word "put" is  
 (1) papa, uniform, texas (2) papa, uniform, tango  
 (3) papa, up, texas (4) peak, uniform, tango
23. A person who holds a licence to operate an amateur radio station shall not  
 (1) exchange messages with unlicensed radio station  
 (2) speak in aural language  
 (3) send call sign  
 (4) communicate during day time
24. For general class amateur licence the rated peak envelop power of the final stage of the amplifier shall not exceed for J3E  
 (1) 5W (2) 50W (3) 100W (4) 500W
25. A person who holds a licence to operate an amateur radio station shall receive  
 (1) obscene material. (2) private messages (3) distress signals. (4) music.

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### Answers

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