

Department of Examinations, Sri Lanka  
Examination for the issue of Amateur Radio Operator's  
License by the Telecommunications Regulatory Commission  
Of Sri Lanka (General Class) – 2017(2018)

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

\*Answer all questions on this paper itself.

\*Pick out the correct answer and write its **number on the dotted line.**

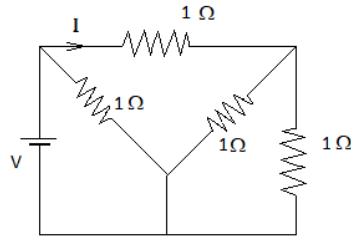
\*A minimum of 50% marks is required for pass **Index No:.....**

1. The first odd harmonic of 144.69 MHz is  
(1) 48.23MHz.      (2) 289.38 MHz.      (3) 434.07 MHz.      (4) 723.45 MHz.      (....)
  
2. To prevent annoying other users on a band, a transmitter should always be tuned initially  
(1) On a harmonic.      (2) into an antenna.  
(3) into a dummy load      (4) on a dipole      (...)
  
3. A sine wave has an RMS value of 12V , the peak to peak value of the wave is  
(1) 16.97 V      (2) 24V      (3) 33.9V      (4) 36.4 V      (...)
  
4. Which of the following is an analog integrated circuit?  
(1) NAND Gate      (2) Microprocessor  
(3) Frequency counter      (4) Linear Voltage Regulator      (...)
  
5. The period of a 1 GHz wave is  
(1) 1 ms.      (2) 1  $\mu$ s.      (3) 1 ns.      (4) 1ps.      (....)
  
6. How is a 3.9 k $\Omega$  resistor colour coded?  
(1) red, white, red, gold      (2) red, green, orange, silver  
(3) orange, white, red, gold      (4) orange, green, orange, silver      (....)
  
7. What are the two major categories for resistors?  
(1) Low and high ohmic value      (2) commercial and industrial  
(3) low and high power value      (4) fixed and variable      (....)
  
8. A colour code of orange, orange, orange is for what ohmic value?  
(1) 22k $\Omega$       (2) 3 300 k $\Omega$       (3) 44 000 k $\Omega$       (4) 33 k $\Omega$       (....)
  
9. If the voltage applied to two resistors in series is doubled, how much will the total power change?  
(1) Increase four times      (2) decrease to half  
(3) double      (4) no change      (....)
  
10. If ten resistors of equal value were wired in parallel, the total resistance would be  
(1) 10/R      (2) 10 x R      (3) 10 + R      (4) R/10      (....)

11. The power output from a transmitter increases from 1 W to 2 W. This is a dB increase of  
 (1) 1.                      (2) 3.                      (3) 30.                      (4) 6.                      (....)

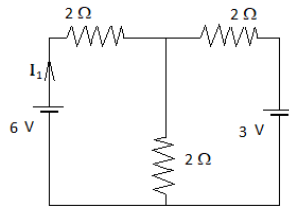
12. Approximately what frequency range can most human here?  
 (1) 20 – 20,000 Hz                      (2) 20,000 – 30,000 Hz  
 (3) 200 – 200,000 Hz                      (4) 0 – 20 Hz                      (....)

13. In the circuit shown below if  $I = 2A$  then find  $V$ .



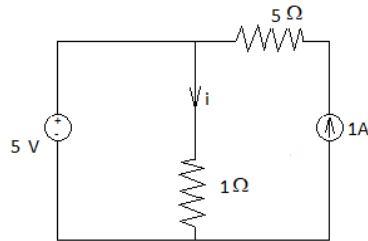
- (1) 5 V  
 (2) 3 V  
 (3) 2 V  
 (4) 1 V                      (....)

14. What is  $I_1$  in the given circuit?



- (1) 0.5 A  
 (2) 1 A  
 (3) 1.5 A  
 (4) 3 A                      (....)

Question No. 15 and 16 are based on following figure.



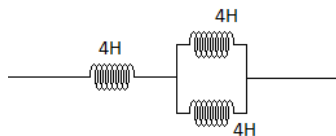
15. What is the value of  $i$   
 (1) 5A      (2) 0.5A                      (3) 6A                      (4) 12A                      (....)

16. In above question, power given by the 5V source is  
 (1) 20 W      (2) 25 W      (3) 30 W      (4) 5 W                      (....)

17. Three Ohm ( $3\Omega$ ) resistors are connected in the form of a triangle. What is the resistance between any two corners?  
 (1)  $\frac{3}{4}$  Ohm      (2) 3 Ohm      (3) 2 Ohm      (4)  $\frac{4}{3}$  Ohm      (...)
18. If you make a quarter wave length vertical antenna for 21.125 MHz, how long would it be ?  
 (1) 7.2 meters (23.6 ft)      (2) 6.76 meters (22.2 ft)  
 (3) 3.36 meters (11.0 ft)      (4) 3.6 meters (11.8 ft)      (...)
19. What are some advantages of a Yagi antenna with wide element spacing?  
 (1) high gain, lower loss and a low SWR  
 (2) high front to back ratio and lower input resistance  
 (3) shorter boom length, lower weight and wind resistance  
 (4) high gain, less critical tuning and wider bandwidth      (...)
20. What is the low angle radiation pattern of an ideal half wave length dipole HF antenna in free space installed parallel to the earth?  
 (1) It is a figure-eight, off both ends of the antenna.  
 (2) It is a figure-eight, perpendicular to the antenna  
 (3) It is a circle. (equal radiation in all direction)      (...)  
 (4) It is two smaller lobes on one side of the antenna and one larger lobe on the other side.
21. When a signal is returned to earth by the ionosphere what is this called?  
 (1) Earth-Moon-Earth propagation      (2) Sky-wave Propagation  
 (3) Tropospheric propagation      (4) Ground wave propagation      (...)
22. What type of propagation usually occurs from one hand-held VHF transceiver to another nearby?  
 (1) Line of sight propagation      (2) tunnel propagation  
 (3) sky wave propagation      (4) Auroral propagation      (...)
23. Which ionospheric region is closest to the Earth?  
 (1) The F region      (2) The A region      (3) The D region      (4) The E region      (...)
24. What two sub-regions of ionosphere exist only in the day time?  
 (1) Electrostatic and electromagnetic      (2) D and E  
 (3)  $F_1$  and  $F_2$       (4) Troposphere and stratosphere      (...)
25. How long is an average sunspot cycle?  
 (1) 11 years      (2) 17 years      (3) 5 years      (4) 7 years      (...)

26. How do sunspots change the ionization of the atmosphere?  
 (1) The more sunspots, the greater the ionization  
 (2) The more sunspots, less the ionization  
 (3) Unless there are sunspot, the ionization is zero  
 (4) They have no effect (....)
27. What is solar flux?  
 (1) The radio energy emitted by the sun  
 (2) The density of the sun's magnetic field  
 (3) Number of sunspots  
 (4) Illumination level (....)
28. If your transmitter sends signals outside the band it is transmitting, what is it called?  
 (1) Spurious emissions (2) Transmitter chirping  
 (3) Side tones (4) off-frequency emissions (....)
29. What type of interference may come from a multi-band antenna connected to a poorly tuned transmitter?  
 (1) Harmonics radiations (2) Parasitic excitation  
 (3) Intermodulation (4) Auroral distraction (....)
30. Ammeter should always have a  
 (1) High resistance. (2) low resistance.  
 (3) low voltage. (4) high voltage. (...)
31. The electric energy consumed by a coil is stored in the form of  
 (1) An electrostatic field. (2) an electric field.  
 (3) A force field. (4) a magnetic field. (....)
32. Which two values are plotted on a B-H curve graph?  
 (1) Permeability and reluctance. (2) flux density and magnetizing force  
 (3) magnetizing force and permeability. (4) reluctance and flux density (...)

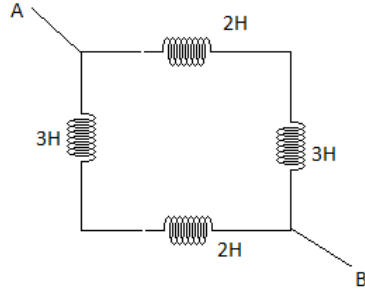
33.



Total inductance is

- (1) 12 H.  
 (2) 6 H.  
 (3) 4 H.  
 (4) 4.5H. (....)

34.



Total inductance is

- (1) 2 H.
  - (2) 3 H.
  - (3) 2.5 H.
  - (4) 3.5 H.
- (...)

35. A capacitor carries a charge of 0.1C at 5V. Its capacitance is

- (1) 0.02 F
  - (2) 0.5 F
  - (3) 0.05 F
  - (4) 0.2 F
- (...)

36. Four capacitors each 40  $\mu$ F are connected in parallel, the equivalent capacitance of the system will be

- (1) 160  $\mu$ F
  - (2) 10  $\mu$ F
  - (3) 40  $\mu$ F
  - (4) 5  $\mu$ F
- (...)

37. When manufacturing a capacitor it is better to select a dielectric having

- (1) Low permittivity.
  - (2) high permittivity.
  - (3) permittivity same as that of air
  - (4) permittivity more than that of air
- (...)

38. The absolute permittivity of a dielectric medium is represented as

- (1)  $\epsilon_0$
  - (2)  $\epsilon_r$
  - (3)  $\epsilon_r / \epsilon_0$
  - (4)  $\epsilon_r \epsilon_0$
- (...)

39. At which angles does the front to back ratio specify an antenna gain?

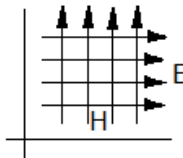
- (1)  $0^\circ$  to  $180^\circ$
  - (2)  $90^\circ$  and  $180^\circ$
  - (3)  $180^\circ$  and  $270^\circ$
  - (4)  $180^\circ$  and  $360^\circ$
- (...)

40. If the tower antenna is not grounded which method of excitation is/are applicable to it?

- (1) Series.
  - (2) shunt.
  - (3) both (1) and (2).
  - (4) none of the above.
- (...)

41. In the diagram given below the polarization is

- (1) Vertical.
- (2) Horizontal.
- (3) Forward.
- (4) Backward.



(...)

42. The Output amplifier of an SSB transmitter must

- (1) act as a switch
  - (2) be in a linear mode.
  - (3) be in the non-linear mode.
  - (4) act as a multiplier.
- (...)

43. FM signal is better than AM signal because  
(1) less immune to noise. (2) less adjacent channel interference  
(3) amplitude limiters are used. (4) all are correct (...)
44. FM is disadvantageous over AM signal because  
(1) much wider channel bandwidth is required.  
(2) FM systems are more complex and costlier.  
(3) adjacent channel interference is more.  
(4) both (1) and (2). (...)
45. In an AM wave useful power is carried by  
(1) carrier. (2) side bands.  
(3) both side bands and carrier (4) none of the above. (...)
46. In amplitude modulation, Band width is.....the audio signal frequency.  
(1) thrice (2) four times (3) twice (4) none of the above (...)
47. Over modulation results in  
(1) weakening of the signal. (2) excessive carrier power.  
(3) distortions. (4) none of the above (...)
48. When the modulating signal controls the frequency of the carrier we get  
(1) Phase modulation (2) amplitude modulation  
(3) frequency modulation (4) none of the above (...)
49. In a series RLC circuit what is the power factor just below the resonance frequency?  
(1) lagging (2) leading  
(3) unity (4) zero (...)
50. In a RLC circuit at resonance condition, the value of current is  
(1) Maximum. (2) minimum.  
(3) zero. (4) none of the above. (...)

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Answers:-

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

One solar flux unit = 1 SFU =  $10^{-22} \text{ Wm}^{-2}\text{Hz}^{-1}$

Q-50 – The question is incomplete. No correct answer.

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

**One hour**

\*Answer all questions on this paper itself.

\*A minimum of 50% mark is required for pass

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

For each of the questions from No. 1 to 25 select the most suitable answer out of the four answers given and write its **number on the dotted line** provided.

1. The Q code for standby is  
(1) QRN.      (2) QRM.      (3) QRS.      (4) QRX.
  
2. "COIL" using the phonetic alphabet would be  
(1) Charlie, Oscar, India, Lima  
(2) Charlie, Oceans, Indictable, London  
(3) Coil, Oscar, Italy, London  
(4) Charlie, Oscar, Italy, London      (...)
  
3. What does the Q signal "QTR" mean?  
(1) slow down      (2) send faster      (3) the time is      (4) please standby for      (...)
  
4. What does the Q signal "QRO" mean?  
(1) quitting operation      (2) zero beat may signal  
(3) you are sending too fast      (4) increase power      (...)
  
5. What is the Q signal for "I have interference"?  
(1) QRO      (2) QRX      (3) QRM      (4) QRN
  
6. Using the phonetic alphabet "RADIO" would be  
(1) Romeo, Alpha, Delta, India, Oscar      (2) Romeo, Alpha, Denmark, India, Oscar  
(3) Romeo, Alpha, Delta, Italy, Oscar      (4) Romeo, Alpha, Delta, Italy, Oscar      (...)
  
7. In the RST code, T stands for  
(1) Temperature.      (2) Tone.      (3) Time.      (4) Transmitter.      (...)
  
8. H3E is the designation for  
(1) Frequency modulation      (2) SSB with full carrier  
(3) SSB with reduced carrier      (4) SSB with no carrier      (...)



9. When calling a station it is a good practice to  
(1) put your call sign first.  
(2) use your call sign only.  
(3) Put the call sign of the station being called first.  
(4) Use the call sign of the other station only. (...)
10. In RST code, R5 means,  
(1) Unreadable.  
(2) Readable with considerable with difficulty.  
(3) Readable with practically no difficulty.  
(4) Perfectly readable. (...)
11. R3E is designation for  
(1) SSB reduced carrier. (2) SSB full carrier.  
(3) SSB with no carrier. (4) Vestigial SB (...)
12. SSB suppressed carrier transmission is denoted by  
(1) A3E. (2) F3E. (3) R3E. (4) J3E. (...)
13. The Q code for closing down is  
(1) QRT. (2) QRC. (3) QRP. (4) QRZ. (...)
14. Before commencing the transmission, the operator should  
(1) listen to the my frequency to see if it is clear  
(2) Turn the AF gain down.  
(3) Turn the my RF gain down.  
(4) Detune the antenna. (...)
15. Using the phonetic alphabet HENRY would be;  
(1) Hotel, Envica, Norway, Romeo, Yankal.  
(2) Hotel, Echo, Nancy, Romeo, Yokohama.  
(3) Hotel, echo, November, Romeo, Yankal.  
(4) Hotel, Echo, November, Romeo, Yankal. (...)
16. Amateur abbreviation "ANT" means  
(1) About. (2) Around. (3) Antenna. (4) Ants. (...)
17. Phonetic alphabet "XZ" represented by  
(1) Xmas, Zoo. (2) Xray, Zulu. (3) Xray, Zoo. (4) Xmas, Zulu. (...)
18. The only general call allowed from an amateur station is  
(1) A news bulletin. (2) A third party call.  
(3) on VHF. (4) A CQ call. (...)

19. It is good safety practice to  
 (1) Use plastic piping for earth. (2) unearth all metal cases.  
 (3) have no master switch (4) supply all mains power via a master switch (...)
20. The band plans should be observed because  
 (1) They are mandatory. (2) They are governed by international regulation.  
 (3) They are only for novice. (4) They are intended to aid opening. (...)
21. Which of the following uses the international Phonetic Alphabet?  
 (1) Boston, Uruguay, Gordon (2) Belgium, Units, Gravity  
 (2) (3) Bee, You, Gee (4) Bravo, Uniform, Gold (...)
22. The station log may be maintained  
 (1) On a computer print out. (2) in loose leaf binder.  
 (3) on magnetic disc. (4) in pencil. (...)
23. Amateur abbreviation (CW) "NW" means  
 (1) NOW. (2) Norway. (3) Never. (4) Network. (...)
24. When in communication with another station the call sign must be sent  
 (1) Every 5 minutes. (2) every 10 minutes.  
 (3) At least every 5 minutes. (4) At least every 30 minutes. (...)
25. You are having trouble with receptor due to static. The Q code used would be  
 (1) QSL. (2) QRX. (3) QRZ (4) QRN. (...)

\*\*\*\*\*

Answers:-

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

Q-5 question is incomplete – No correct answer

Q-15 No answer. Correct answer is "Hotel, Echo, November, Romeo, Yankee"

Q-21 No correct answer