Sample question paper of the examination for award of Amateur Station Operator's Licence (General and Restricted Grade)

Government of India
Ministry of Communications &IT
Department of Telecommunications

Note:
1. All questions are of Multiple Choice type.
2. Maximum marks 100.
3. Restricted grade candidates have to answer the first 25 questions(each question carries Two marks) from each section and the time allotted for it is One hour.
4. General grade candidates have to answer all the 50 questions(each question carries One mark) from each section and the time allotted for it is Two hours.

SECTION-A
(Radio Theory and Practice)

1. The Transformer works on the principle of [ ]
   a) Self Inductance b) Mutual Inductance
   c) both a & b d) None

2. The Frequency of oscillation of a series RLC resonant circuit is [ ]
   a) $f=1/2\pi\sqrt{LC}$ b) $f=1/\pi\sqrt{LC}$
   c) $f=2\pi\sqrt{LC}$ d) None

3. The Capacitor is a [ ]
   a) Passive device b) Active device
   c) both a & b d) None

4. The frequency of a sinusoidal signal v(s)=10sin100t volts is [ ]
   a) 100/2π c/s b) 50 c/s c) 100 c/s d) 100t c/s

5. The resistance value of an Insulator is [ ]
   a) Zero b) Very High c) Less than unity d) None

6. The Conductance is proportional to [ ]
   a) Resistance b) Inverse of Resistance
   c) Reactance c) Inverse of Reactance

7. The power can be expressed as [ ]
   a) V=IR b) P=VI c) $P=I^2R$ d) both b & c

8. The Law behind electromagnetism is [ ]
   a) Newton's law b) Faradays law
   c) Kirchoffs law d) keplers law

9. As per Kirchoffs voltage law, in a closed circuit [ ]
   a) All the branch voltages meeting at a node should be zero
   b) All the branch currents meeting at a node should be zero
   c) The sum of all the voltage drops is equal to applied voltage
   d) None of the above

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10. The Impedance of a resonant circuit is [ ]
    a) Zero b) Equal to resistance
    c) Unity d) Equal to reactance

11. The Bridge rectifier is a [ ]
    a) Full-wave type b) Half-wave type
    c) both a & b d) None of the above

12. A Diode can be used as [ ]
    a) Rectifier b) Detector c) Switch d) All the above

13. An Oscillator is based on [ ]
    a) Positive feedback b) Negative feedback
    c) No feedback d) both a & b

14. The output signal of an CE amplifier will be [ ]
    a) 45 deg out of phase b) 90deg out of phase
    c) 180 deg out of phase d) 270 deg out of phase

15. In the process of modulation in communication system [ ]
    a) Signal frequency is more than carrier frequency
    b) Signal frequency is less than carrier frequency
    c) Signal frequency will be directly transmitted
    d) Signal frequency equals carrier frequency

16. The typical value of IF in a Superhetrodyne receiver is [ ]
    a) 450KHz b) 455KHz c) 500KHz d) 405KHz

17. The output signal of a detector in a communication receiver is in [ ]
    a) Audio Frequency range b) Radio Frequency range
    c) Intermediate Frequency range d) None of the above

18. In a Radio receiver, the sensitivity will be governed by [ ]
    a) RF b) Detector c) AF d) None of above

19. The noise in a Radio receiver can be expressed as [ ]
    a) S/N ratio b) N/S ratio
    c) Level of reference signal d) None of above

20. The following type of Oscillator will be more stable [ ]
    a) RC Oscillator b) Hartley Oscillator
    c) Colpitts Oscillator d) Crystal Oscillator

21. The length of a dipole for a signal frequency of 300MHz is [ ]
    a) 10 mtrs b) 1 mtr c) 0.1 mtr d) 1 cm

22. The frequency 7100 KHz can be transmitted by [ ]
    a) Tropospheric propagation b) Ionospheric propagation
    c) Ground wave propagation d) Surface wave propagation

23. The most suitable antenna for receiving VHF range is [ ]
    a) Dipole b) Log periodic c) Yaagi d) None of the above

24. The skip distance is the distance between [ ]
    a) Transmitter and Receiver b) Transmitter and Ionospheric layer
    c) Receiver and Ionospheric layer d) Between two Ionospheric layers

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25. In A1A transmission [ ]
a) Amplitude of the carrier is modulated
b) Frequency of the carrier is modulated
c) Both a & b d) None of above

26. The colour bands of a 4.7KΩ±5% resistor are [ ]
a) Yellow, Violet, Orange and Gold
b) Yellow, Violet, Red and Gold
c) Yellow, Violet, Orange and Silver
d) Yellow, Violet, Red and Silver

27. A signal(f_m) is amplitude modulated with a carrier(f_c), the frequency value of Lower Side Band is [ ]
a) $f_m - f_c$ b) $f_m + f_c$ c) $f_c - f_m$ a) $f_c + f_m$

28. The doping concentrations of Emitter, Base and Collector in a NPN transistor is [ ]
a) Heavy, Moderate and Light b) Heavy, Light and Moderate
c) Moderate, Light and Heavy d) Moderate, Heavy and Light

29. The wavelength of a signal v(s)=5cos $6\pi 10^6 t$ is [ ]
a) 100m b) 50m c) 100cm d) 50cm

30. The Mutual Inductance(M) between two coils of Self Inductance L_1 and L_2 respectively can be expressed as [ ]
a) $M=\sqrt{L_1 L_2}$ b) $M=1/\sqrt{L_1 L_2}$
c) $M=k\sqrt{L_1 L_2}$ d) $M=k/\sqrt{L_1 L_2}$

31. For a Step-down Transformer, the relation between the number of turns in primary (N_p) and the number of turns in secondary (N_s) is [ ]
a) $N_s > N_p$ b) $N_s < N_p$ c) $N_s = N_p$ d) None of the above

32. The layer that reflects higher end frequencies in HF range during the day time is [ ]
a) F_1 layer b) F_2 layer c) E layer d) D layer

33. The power conversion efficiency of a Full-wave rectifier is [ ]
a) 40.6% b) 81.2% c) 100% d) Zero

34. The length of dipole, reflector and director of Yaagi Antenna in terms of wave length are [ ]
a) 0.55λ, 0.5λ and 0.45λ b) 0.45λ, 0.5λ and 0.55λ
c) 0.5λ, 0.55λ and 0.45λ d) 0.5λ, 0.45λ and 0.55λ

35. The side-band system adopted for Television transmission [ ]
a) Independent Sideband b) Vestigial Sideband
c) Suppressed Sideband d) All the above

36. One of the limitations of usage of BJT at Micro-wave frequencies is [ ]
a) Size b) Transit-time c) Power d) all the above

37. The oscillator that makes a communication receiver capable of receiving morse code is [ ]
a) Voltage Controlled Oscillator b) Local Oscillator
c) Beat Frequency Oscillator d) Phase Locked Loop

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38. The circuit that enables the radio receiver output to remains cutoff when carrier is absent [ ]
a) AGC b) Squelch c) Delayed AGC d) Noise Limiter

39. The category of pulse modulation that comes under digital systems is [ ]
a) Pulse Code Modulation b) Pulse Amplitude Modulation
c) Pulse Time Modulation d) All the above

40. The highest frequency that is reflected by an Ionosphere layer is [ ]
a) Maximum Usable Frequency b) Critical Frequency
c) Carrier Frequency d) All the above

41. The device that can be used as a Voltage Regulator is [ ]
a) Gun diode b) Zener Diode c) Pin Diode d) both a & c

42. The Reactance of a Capacitor increases when the frequency is [ ]
a) increased b) decreased c) zero d) remains constant

43. The elements in the tank circuit of a Colpitts Oscillator are [ ]
a) L and C b) R and C c) R and L d) R, L and C

44. The circuit that reduces ripples from the output of a Rectifier is [ ]
a) Limiter b) Discriminator c) Blanker d) Filter

45. Express the gain of an amplifier in dBm, when the output power of it is 100mW. [ ]
a) 10 dBm b) 20 dBm c) 40 dBm d) 0 dBm

46. The output of an Amplifier with 10 dB gain and an input of 1mW is [ ]
a) 10 mW b) 100 mW c) 1 mW d) 0 mW

47. The Transformers are rated in [ ]
a) Watts b) Volts c) Amperes d) Volt-Amperes

48. Batteries are connected in parallel to get more [ ]
a) Current capacity b) Voltage capacity
c) both a & b d) None of the above

49. A Superhetrodyne receiver with local oscillator frequency range 3.455 to 30.455 MHz is capable of receiving the input signal range is [ ]
a) 88-108 MHz b) 3-30 MHz c) 565-1600 KHz d) 2-17 MHz

50. The Capability of a receiver to receive weakest possible signal is its [ ]
a) Selectivity b) Sensitivity c) Fidelity d) All the above

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SECTION-B
(Radio Regulations)

1. The value of bandwidth shown as 3K50 is [ ]
a) 3050 Hz b) 3500 Hz c) 3500 KHz d) 3050 KHz

2. The first character in class of Emission signifies about [ ]
a) Nature of signal(s) modulating the main carrier
b) Type of modulation of the main carrier
c) Type of Information to be transmitted
d) Details of multiplexing the signal(s)

3. In the Morse code, the Test signal contains the characters of [ ]
a) CQ CQ CQ b) V V V c) RT RT RT d) NON.

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4. The range of VHF band is [ ]
   a) 3 to 30 MHz b) 30 to 300 MHz c) 300 to 3000 MHz
   d) 0.3 to 3 MHz

5. The time difference between IST and UTC is [ ]
   a) 05.30 Hrs. b) 05.00 Hrs. c) 05.15 Hrs. d) 05.45 Hrs.

6. The characters in the RST system stands for [ ]
   a) Readability, Signal and Test
   b) Readability, Signal strength and Test
   c) Readability, Signal strength and Tone
   d) Readability, Signal loss and Tone

7. The VHF Frequency range that is authorised to Amateurs is [ ]
   a) 140 – 146 MHz b) 144 – 146 MHz c) 140 – 144 MHz
   d) 146 – 148 MHz

8. The ' Single Side Band with Suppressed Carrier ' is designated as [ ]
   a) H3E b) R3E c) J3E d) A3E

9. The space between two words in Morse code is [ ]
   a) a dot b) a dash c) a dot and a dash d) five dots

10. The Q Code for 'Are you busy?' is [ ]
    a) QRM b) QRL c) QSA d) QRN

11. The distress frequency on Voice (Radio Telephony) is [ ]
    a) 2128 KHz b) 2182 KHz c) 1282 KHz d) 1228 KHz

12. The characters that a Safety Signal contains in Morse code are [ ]
    a) XXX b) MAY DAY c) PAN PAN d) SSS

13. The Phonetic used to represent digit '8' is [ ]
    a) Octa Eight b) Okta Eight c) Okto Eight d) Octo Eight

14. The Answer or Advice for the Q-Code 'QTH' is [ ]
    a) My exact location is .... b) What is your exact location?
    c) My correct time is .... Hrs. d) None of the above

15. The written confirmation of a contact, exchanged between Amateurs is [ ]
    a) QSA3 b) QSL NR53 c) QST? d) QRX 1100

16. The abbreviation used for 'All Before' is [ ]
    a) AA b) AB c) AR d) AS

17. The calling Amateur's call sign in 'VU2DX DE VU2DJ' is [ ]
    a) VU2DX b) VU2DJ c) DE d) VU2

18. The maximum characters that an Amateur Call Sign contains is [ ]
    a) Four b) Five c) Six d) Three

19. The frequency range in 21 MHz band that is authorised to Amateurs is [ ]
    a) 21000 – 21350 KHz b) 21000 – 21450 KHz
    c) 21100 – 21150 KHz c) 21000 – 21400 KHz

20. The Emission that is used to sent Morse code by on/off keying the Unmodulated carrier in CW Transmission is [ ]
    a) A1A b) A2A c) A3A d) A5C

21. The Q-code for 'The signal strength of your signals are Good' [ ]
    a) QSA 5 b) QSA 4 c) QSA 1 d) QSA 3.

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22. The character that represents the Morse code '_ _ . _' is [ ]
a) Y b) Z c) C d) Q

23. The Amateur Licence will be issued in India by [ ]
a) Wireless Monitoring Organisation
b) Wireless Planning and Coordination Wing
c) Telecomm Regulatory Authority of India
d) Bharat Sanchar Nigam Limited

24. The Call sign blocks allotted to India are [ ]
a) ATA – AWZ b) VTA – VWZ c) 8TA – 8WZ
d) a & b e) a , b & c

25. The UTC stands for [ ]
a) Universal Time for Coordination
b) Universal Coordinated Time
c) United States Telecomm Community
d) Universal Telecommunication Centre

26. The Emission 'C3F' stands for [ ]
a) Double Side band Transmission
b) Single side band Transmission
c) Vestigial side band Transmission
d) Suppressed side band Transmission

27. The number of characters in a 8 wpm in 5 minutes passage should be [ ]
a) 240 b) 200 c) 160 d) 400

28. The standard shift between transmitting and receiving frequency for Amateur Radio in VHF band is [ ]
a) 500 KHz b) 600 KHz d) 1000 KHz d) 1200 KHz

29. The equivalent time in hours of 1730(IST) in UTC is [ ]
a) 1200Z b) 1230Z c) 0000Z d) 0530Z

30. The Q-code for 'I will call you again at 0400 hrs in the evening' is [ ]
a) QRX0400 b) QRX1600 c) QRX4 d) QRX0400Z

31. The Emission stands for an AM Broadcast with 3 KHz bandwidth is [ ]
a) A3E3000K b) A3E3K00 c) A3E0K300 d) A3E0H30

32. The distress frequency 156M800 Hz falls in the range of [ ]
a) HF band b) UHF band c) Microwave band d) VHF band

33. The character for Morse code '. . _ _ . . ' is [ ]
a) Full stop b) Comma c) Question mark d) Hyphen

34. In a Morse code transmission what will be the duration of a dot, when the duration of a dash is 30mSec. [ ]
a) 90mSec b) 10mSec c) 1mSec d) 9mSec

35. The Abbreviation for 'I have nothing for you' is [ ]
a) QRU b) NIL c) NFU d) None of the above

36. Frequencies those are authorised to use during the 0800 to 2000 Hrs. of the day will be indicated as [ ]
a) H24 b) HN c) HJ d) HX

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37. The Phonetic used for alphabet 'N' is [ ]
a) Norvey b) November c) Neighbor d) Night

38. The urgent messages in a Morse code are indicated by [ ]
a) PAN PAN b) XXX c) T T T d) V V V

39. The Emission that indicates a FM Broadcast station is [ ]
a) F1A b) F3A c) F3E d) F3C

40. What are the letters required to be sent for a third station to enter between two stations in a Morse code transmission are [ ]
a) BR b) BK c) BREAK d) BN

41. The word used in Voice which is equivalent to the word 'DE' transmitted in a Morse code transmission is [ ]
a) FROM b) THIS IS c) CALLING d) All of the above

42. The letters those are required to be sent in the time of Distress in Voice transmission are [ ]
a) SOS b) MAY DAY c) PAN PAN d) SECURTIE

43. The Q-code for Test Signal is [ ]
a) QRK b) QSU c) QSV d) QUM

44. In abbreviation 73, refers to [ ]
a) thanks b) welcome c) best regards d) none of these

45. The frequencies those are designated with 'HX' can be used [ ]
a) during the day time b) during the night time
c) intermittently d) 24 Hrs. of a day

46. The suffix that is required to be sent along with the call sign for a Mobile Amateur Station is [ ]
a) MOBILE b) MO c) MX d) None of the above

47. What will be the speed in wpm, when a message being transmitted contains 60 characters in a minute [ ]
a) 5 wpm b) 8 wpm c) 10 wpm d) 12 wpm

48. The ITU stands for [ ]
a) International Trade Union b) Indian Trade Unions
c) Indian Telecommunication Union
d) International Telecommunication Union

49. In RST system for Morse code transmission [ ]
a) R and S need to be reported
b) R and T need to be reported
c) T and S need to be reported
d) R, S and T are necessary

50. The type of Infringement to be sent upon using incorrect emission is [ ]
a) Un Authorised Frequency b) Un Authorised Period
c) Un Authorised Emission d) Un Authorised Call Sign

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