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GN-262

V Semester B.Sc. Examination, December - 2019
(CBCS) (F+R) (2016-17 & Onwards)
ELECTRONICS - V
EL501 : COMMUNICATION - I

Time : 3 Hours Max. Marks : 70

Instructions : *(i) Answer* ***all*** *questions from* ***Part - A***, ***any five*** *questions from* ***Part - B*** *and* ***any four*** *questions from* ***Part - C***.

(ii) Answer ***all*** *questions from* ***Part - A*** *in* ***any one*** *page, the same question answered multiple times will not be considered for evaluation.*

PART - A

Answer **all** the subdivisions. **15x1=15**

1. (i) The Noise Figure of an ideal amplifier is _____.
(a) 1 (b) 0 (c) ∞ (d) None

(ii) Z and Y are _____ constants of transmission line.
(a) primary (b) secondary
(c) tertiary (d) none of the above

(iii) Signal fading in communication system is because of _____.
(a) interference of signals
(b) absorption of signals by earth surface
(c) both (a) and (b)
(d) none of the above

(iv) In AM, if depth of modulation increases, then its total radiated power_____.
(a) increases (b) no change
(c) decreases (d) none of the above

(v) A pre-emphasis circuit is used in FM transmitter to increase the amplitude of _____.
(a) lower audio frequencies (b) higher audio frequencies
(c) carrier frequency (d) none of the above

(vi) The frequency spectrum allocated for AM transmission is _____.
(a) 535 kHz - 1605 kHz (b) 88 MHz - 108 MHz
(c) 535 MHz - 1605 MHz (d) 88 kHz - 108 kHz

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(vii) The Intermediate Frequency (IF) of Super Heterodyne FM receiver is _____.
(a) 225 kHz (b) 10 MHz
(c) 455 kHz (d) 10.7 MHz

(viii) Varactor diode is used in FM detector to _____.
(a) maintain standard frequency deviation
(b) change the amplitude of FM signals
(c) change the IF frequency
(d) all the above

(ix) Which of the following is the same in AM and FM receivers ?
(a) discriminator (b) limiter
(c) IF amplifier (d) all of the above

(x) Which antenna receives signal in all direction ?
(a) bidirectional antenna (b) unidirectional antenna
(c) isotropic antenna (d) none of the above

(xi) The grounded antenna is also called _____.
(a) Marconi antenna (b) Loop antenna
(c) Helical antenna (d) None of the above

(xii) The total length of a folded dipole antenna is _____.
(a) quarter wavelength (b) half wavelength
(c) several wavelength (d) none of the above

(xiii) American TV system has _____ number of horizontal lines per frame.
(a) 405 (b) 525
(c) 625 (d) none of above

(xiv) The aspect ratio of a TV receiver picture tube is _____.
(a) 2:1 (b) 4:3 (c) 1:2 (d) 3:4

(xv) In colour TV, RED+BLUE= _____.
(a) green (b) magenta (c) cyan (d) white

PART - B

5x7=35

Answer **any five** questions.

2. (a) Define signal to noise ratio and noise figure. **2+5**
(b) Explain in brief sky wave propagation.

3. (a) What is a transmission line ? Define its primary and secondary constants. **3+4**
(b) With a circuit diagram, explain the working of an AM collector modulator.

4. Draw and explain the block diagram of FM transmitter with AFC. **7**

5. (a) With a circuit diagram explain the working of a AM transistor detector. **4+3**
(b) Draw the block diagram of AM super heterodyne Radio receiver.

6. (a) Explain the need for de-emphasis in FM receiver. **2+5**
(b) List the characteristics of radio receiver and explain.

7. (a) Define the terms : **3+4**
(i) bandwidth
(ii) beamwidth
(iii) directive gain with respect to an antenna.

(b) Write a note on :
(i) loop antenna
(ii) helical antenna

8. (a) Distinguish between resonant and non resonant antenna. **3+4**
(b) What are blanking and synchronizing pulses in TV systems ?

9. Draw the block diagram of a monochrome TV transmitter and explain in brief the function of each block. **7**

PART - C

Answer **any four** questions. **4x5=20**

10. Calculate the rms noise voltage appearing across a 20 kΩ resistor at 25°C ambient temperature with an effective noise bandwidth of 10 kHz. If the temperature is decreased to 17°C, calculate the new rms noise voltage. **5**

11. Find the percentage of modulation in the following cases : **5**
(i) $V_{max} = 10$ Volts and $V_{min} = 4$ Volts
(ii) $I_t = 5$ A and $I_c = 4.8$ A

12. In FM modulating frequency is 15 kHz and frequency deviation is 75 kHz, calculate the carrier swing, modulation index and bandwidth. **5**

13. What is an image frequency ? How its rejection is achieved ? **5**

14. Find the radiation resistance of a dipole antenna of length $\lambda/2$ also find antenna efficiency, if the ohmic loss resistance of the dipole antenna is (i) 5 Ω (ii) 180 Ω **5**

15. In a colour TV system the signal voltages corresponding to the three primary RGB colours are given as 4 mV, 3 mV and 2 mV respectively. Calculate voltages corresponding to Y, I and Q signals. **5**

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