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V Semester B.Sc. Degree Examination, March - 2021

ELECTRONICS - V

Communication - I

(CBCS (Freshers and Repeaters Scheme 2016-17 and On wards))

Paper : V (EL - 501T)



Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Answer All questions from Part - A. Any Five questions from Part - B and any Four questions from Part - C.

Note: Answer all questions of Part - A in any one page, the same question answered multiple times will not be considered for evaluation.

PART - A

Answer All the subdivisions

(15×1=15)

1. i) Ratio of the signal to noise ratio at the input to the signal to noise ratio at the output of a Receiver is called as.
 - a) Noise power
 - b) Noise gain
 - c) Noise Figure
 - d) Noise Intensity.
- ii) Random variation in the movement of charge carriers in any amplifying device leads to:
 - a) Thermal agitation noise
 - b) Solar noise
 - c) Cosmic noise
 - d) Shot noise.
- iii) A measure of the mismatch between load and the transmission line is _____.
 - a) Return Loss
 - b) SWR
 - c) Phase-shift constant
 - d) Reflection coefficient
- iv) Which of the following layers of the Ionosphere disappear at night?
 - a) D layer
 - b) E layer
 - c) F₁ layer
 - d) F₂ layer

[P.T.O.]

- v) In Amplitude modulation system, the Bandwidth is _____ the modulating signal frequency
 - a) Thrice
 - b) Twice
 - c) Equal to
 - d) Half of
- vi) In Amplitude modulation, if the depth of modulation increases, the total power in AM wave.
 - a) decreases
 - b) Increases
 - c) Remains constant
 - d) Becomes equal to the modulating power.
- vii) Which of the following is not used in AM Super heterodyne Radio Receivers?
 - a) RF amplifier
 - b) Local Oscillator
 - c) IF Amplifier
 - d) Limiter
- viii) The Intermediate frequency generally employed in FM broadcast Radio Receivers is:
 - a) 10.7 MHz
 - b) 33.4 MHz
 - c) 455 kHz
 - d) 525 kHz
- ix) Isotropic Antenna is one which _____
 - a) Radiates signal in one direction
 - b) Has higher efficiency
 - c) Has narrow bandwidth
 - d) radiates signal in all directions.
- x) At a given frequency, the total length of a Folded dipole antenna is generally equal to
 - a) Wavelength of the signal
 - b) Half wavelength of the signal
 - c) Double the wavelength of the signal
 - d) Quarter wavelength of the signal
- xi) A loop antenna usually employed for
 - a) Transmission of UHF signal
 - b) Direction finding
 - c) Transmission of VHF signal
 - d) Impedance matching purpose only
- xii) Non-Resonant Antenna has
 - a) More Radiation efficiency
 - b) No Standing waves
 - c) Standing waves
 - d) Reflected wave



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xiii) The field frequency used in Indian TV system is:

- | | |
|----------|----------|
| a) 50 Hz | b) 30 Hz |
| c) 25 Hz | d) 60 Hz |

xiv) In TV systems, Interlaced scanning is used to

- a) Increase the brightness of the picture
- b) Increase the sharpness of the picture
- c) Avoid the flickering of the displayed image
- d) Increase the contrast of the image

xv) In colour TV system, BLUE colour added to RED colour yields,

- | | |
|------------|----------|
| a) Magenta | b) Green |
| c) Yellow | d) White |

PART - B

Answer any **Five** questions.

(5×7=35)

2. a) Define Signal to Noise ratio. (2+5)
b) Draw the equivalent circuit of a Transmission line. Define its Secondary constants.
3. a) Derive an expression for instantaneous voltage of an AM wave and draw its frequency spectrum. (5+2)
b) Draw the circuit of an AM collector modulator.
4. a) With a block diagram. Explain the working of an AM transmitter. (5+2)
b) Define 'Frequency deviation' and 'carrier swing' with respect to FM.
5. a) Define terms 'Selectivity' and 'Fidelity' with respect to a radio receiver. (2+5)
b) Draw the Block diagram of an FM super heterodyne receiver and explain the function of each block.
6. a) Draw the circuit of a Linear diode detector and explain its working. (5+2)
b) What is image frequency in an AM receiver?
7. a) Define: (2+5)
 - i) Directive gain and
 - ii) Beam width with respect to an Antenna.
b) Derive an expression for the total power radiated by an Antenna.

[P.T.O.]



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8. a) What is Resonant Antenna? Draw the radiation pattern for a Resonant Antenna of length $\ell = \lambda / 2$ and $\ell = 3\lambda / 2$. (4+3)
b) What are Blanking and Synchronising pulses in TV system.
9. Draw the Block diagram of a Monochrome TV transmitter and explain the function of each block.

PART - C

Answer any Four questions.

(4×5=20)

10. Calculate the rms noise voltage appearing across a $20\text{ k}\Omega$ resistor of 25°C ambient temperature with an effective noise bandwidth of 10 MHz . If the temperature is decreased to 17°C , calculate the new rms noise voltage.
11. The total power contained in an AM signal is 900 W . Determine the power carried by the carrier component and each of the side-bands when the percentage of modulation is 100% .
12. In a Frequency modulator, the frequency of modulating signal (f_m) is 5 kHz and the modulating voltage (V_m) is 5 V , the modulation index is 6. Calculate the modulation index if:
i) f_m is increased to 10 kHz and V_m is decreased to 3 V ?
ii) f_m is decreased to 3 kHz and V_m is increased to 10 V ?
13. Draw the circuit of a transistor detector in an AM receiver and explain its working.
14. A horizontal wire antenna of length 3 m has an rms current of 3 A flowing through it. If the frequency of the signal is 10 MHz , calculate
a) Radiation resistance
b) Radiation efficiency and
c) Total power radiated if the loss resistance of the antenna is 10Ω .
15. Calculate the horizontal and vertical frequencies of interlaced scanning for the following TV systems.
i) 525 lines per frame and 30 frames/sec.
ii) 625 lines per frame and 25 frames/sec.
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V Semester B.Sc. Degree Examination, March - 2021

ELECTRONICS

Microprocessor and Electronic Instrumentation

CBCS (Freshers and Repeaters)

Paper : VI (EL 502 T)



Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Answer **all** questions of **PART - A**, any **five** questions from **PART - B**, and any **FOUR** questions from **PART - C**. Answer **ALL** questions of **PART - A** in any one page, the same question answered multiple times will not be considered for evaluation.

PART - A**Answer all subdivisions.****(15×1=15)**

1. (i) In 8085 microprocessor, address bus is
 - a) 4 bits
 - b) 8 bits
 - c) 16 bits
 - d) 32 bits
- (ii) LHLD is _____ byte instruction.
 - a) 1
 - b) 2
 - c) 3
 - d) All the above
- (iii) Which of the following is not a control signal?
 - a) READ
 - b) WRITE
 - c) RESET
 - d) ALE
- (iv) The term Program status word refers to
 - a) Accumulator & Flag register
 - b) H and L register
 - c) Accumulator & Instruction register
 - d) B and C register.
- (v) OUT instruction is _____ bytes instruction.
 - a) 01
 - b) 02
 - c) 03
 - d) None

[P.T.O.]



(vi) Which interrupt has the lowest priority?

- | | |
|------------|------------|
| a) INTR | b) TRAP |
| c) RST 6.5 | d) RST 7.5 |

(vii) Interfacing IC 8279 is also known as _____

- a) Programmable peripheral interface
- b) Keyboard/Display Interface
- c) DMA controller
- d) Both b & c

(viii) Accuracy of an instrument is defined as.

- a) Closeness of output to the true value
- b) Change in output for every change in input
- c) Degree of freedom from random errors
- d) Both (a) and (b)

(ix) POP D is a

- | | |
|-----------------------|-----------------------|
| a) 1 byte instruction | b) 2 byte instruction |
| c) 3 byte instruction | d) 4 byte instruction |

(x) A piezoelectric transducer converts

- a) electrical energy to sound energy
- b) sound energy to electrical energy
- c) temperature to electrical energy
- d) stress to electrical energy

(xi) LVDT works on the principle of

- | | |
|--------------------|----------------------|
| a) self-inductance | b) Mutual inductance |
| c) Resistance | d) Capacitance |



(xii) Precision of an instrument is defined as the

- a) Closeness of output to true value
- b) Change in output for every change in input.
- c) Degree of freedom of random error.
- d) Repeatability of the measured values.

(xiii) In ECG waveform the peak value of the wave is called as

- a) R wave
- b) U wave
- c) T wave
- d) P wave

(xiv) The approximate value of depolarized cell potential is

- a) -20mV
- b) -40mV
- c) +90mV
- d) +20mV

(xv) The type of electrode used in EMG is

- a) Skin electrode
- b) Needle electrode
- c) Contact electrode
- d) both a and c

PART - B

Answer any Five Questions.

(5×7=35)

2. Draw the architecture of 8085 microprocessor. Explain ALU.
3. Explain any four addressing modes in 8085 with an example each.
4. What is Stack? Explain PUSH and POP instructions with an example.
5. Explain the various interrupts available in 8085 microprocessors.
6. Explain the functional block diagram of programmable peripheral IC 8255.
7. a) Define the following terms with respect to measurement systems :
 - i) sensitivity
 - ii) resolution
 - iii) precision
 - vi) accuracy
 - v) expected value.
- b) Write any two differences between active and passive transducers.



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8. Explain the construction of Loud speaker and Microphone.
9. Draw the block diagram of ECG and explain the function of each block.

PART - C

Answer any **Four** questions

(4×5=20)

10. Explain the following instructions.
 - (i) LXI H 9000
 - (ii) LHLD 9000
 - (iii) XRA A
 11. Write an assembly language program to find the sum of two 16-bit numbers in 8085 microprocessor.
 12. Write an assembly language program to find the smallest number in an array of five 8 bit numbers.
 13. Calculate the time delay for the following program with 5MHz clock frequency.

LXI B, 1234	10 T states
BACK: DCX B	05 T states
MOVA, C	05 T states
ORAB	04 T states
JNZ BACK	10/7 T states
 14. In a certain current measurement system, the current to be measured is 25 mA, whereas the measurement yields a current of 22mA.
Calculate the
 - (i) absolute error,
 - (ii) percentage error,
 - (iii) relative accuracy
 - (iv) percentage accuracy.
 15. Draw the block diagram of EEG and explain the function of each block.
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