



SS – 388

V Semester B.Sc. Examination, November/December 2018
(Semester Scheme) (F + R) (CBCS)
(2016 – 17 and Onwards)
ELECTRONICS – V
EL 501 : Communication – I



Time : 3 Hours

Max. Marks : 70

Instructions : Answer *all* questions from Part – A , *any five* from Part – B and *any four* questions from Part – C.

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

PART – A

Answer *all* the sub-questions.

(15×1= 15)

1. i) Atmospheric noise is a form of

- a) Internal noise
- c) Johnson noise

- b) External noise
- d) Shot noise

ii) Noise figure is defined as

a) $\frac{\text{input } \frac{S}{N}}{\text{output } \frac{S}{N}}$

b) $\frac{\text{output } \frac{S}{N}}{\text{input } \frac{S}{N}}$

c) $\frac{\text{Signal voltage}}{\text{Noise voltage}}$

d) $\frac{\text{Noise voltage}}{\text{Signal voltage}}$

iii) An AM wave has _____ side bands.

a) 1

b) 3

c) 2

d) 0

P.T.O.



- iv) The modulation index of an AM wave is changed from 0 to 1. The transmitted power is
- a) Doubled
 - b) Unchanged
 - c) Halved
 - d) Increased by 50%
- v) The bandwidth of FM depends on
- a) Modulating frequency
 - b) Modulation index
 - c) Frequency deviation
 - d) All the above
- vi) In varactor diode modulator, varactor diode is
- a) Forward biased
 - b) No bias applied
 - c) Reverse biased
 - d) None of the above
- vii) The correct sequence of FM detection after converting it to AM is
- a) Rectification, eliminating the carrier, by passing dc voltage
 - b) Eliminating the carrier, rectification, by passing dc voltage
 - c) By passing dc voltage, rectification, eliminating the carrier
 - d) Rectification, by passing dc voltage, eliminating the carrier
- viii) In a radio receiver with simple AGC
- a) Local oscillator is controlled by AGC
 - b) The received signal strength is maintained constant
 - c) Detector gain is controlled by AGC
 - d) Will help in selecting the channel
- ix) The image frequency rejection depends on
- a) Selectivity
 - b) Sensitivity
 - c) Stability
 - d) Receiver
- x) In slope detector output amplitude depends on
- a) Amplitude of the input signal
 - b) Frequency deviation of the input signal
 - c) Frequency of the input signal
 - d) None of the above
- xi) Which network reduces the amplitude of high frequency audio signal ?
- a) Pre-emphasis
 - b) De-emphasis
 - c) Discriminator
 - d) Noise less amplifier
- xii) Non-resonating Antenna is
- a) Bidirectional
 - b) Isotropic
 - c) Will not work as antenna
 - d) Unidirectional



- xiii) The main application of loop antenna is in
- Transmitter of VHF
 - To receiving signal in the direction of the plane.
 - Receiver of SHF
 - Direction finding
- xiv) In vidicon camera tube photo layer has
- Resistance change is not affected by light
 - Low resistance when no light falls on it
 - High resistance when no light falls on it
 - Constant resistance which is independent of light
- xv) In American system TV channel bandwidth is
- 7 MHz
 - 6 MHz
 - 4.2 MHz
 - 5 MHz

PART – B

Answer any five questions.

(5×7=35)

- What is transmission line ? Mention its primary and secondary constants and also draw its equivalent circuit at low and high frequencies.
- Mention different layers in ionosphere with their existence period in a day.
 - Explain the block diagram of electronic communication system. (3+4)
- Define frequency deviation and carrier swing relating to frequency modulation.
 - Draw and explain the block diagram of AM transmitter. (2+5)
- Compare AM with FM
 - Define sensitivity, stability and fidelity of a radio receiver. (4+3)
- What is image frequency ? Write its equation.
 - Explain the working of linear diode detector with circuit diagram and waveforms at different stages. (2+5)
- Write the principle of superheterodyne receiver and explain the block diagram of FM superheterodyne receiver.



8. Define the following Antenna parameters antenna gain, directive gain, power gain, bandwidth, beam width, polarization and efficiency.
9. Explain the block diagram of Monochrome TV receiver.

PART – C

Answer any four questions.

(4×5=20)

10. Calculate the noise voltage at the input of a television RF amplifier using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6 MHz and temperature is 17°C . If the bandwidth is 7 MHz and temperature is 25°C , find new noise voltage for the same setup.
11. A FM wave is represented by $V_{\text{FM}} = 20 \sin [5.5264 \times 10^8 t + 9 \sin 94.2 \times 10^3 t]$. Calculate
 - i) Carrier frequency.
 - ii) Modulating frequency.
 - iii) Frequency deviation.
 - iv) Carrier swing.
12. Draw the radiation pattern and current distribution for an Antenna of length.
 - i) $\lambda/2$
 - ii) λ and
 - iii) $3\lambda/2$
13. An Antenna of length 181 mm has an rms current of 5A flowing through it. If the frequency of the signal is 500 MHz, calculate
 - i) Radiation resistance
 - ii) Total power radiated
 - iii) Efficiency of the Antenna if the loss resistance is 12Ω .
14. Calculate the horizontal and vertical scanning frequencies of interlaced scanning in the following TV standards
 - i) 625 lines per frame and 25 frames per second
 - ii) 525 lines per frame and 30 frames per second.
15. In a colour TV system the signal voltages corresponding to the three primary RGB colours are given as 3mV, 2mV and 1mV respectively. Calculate voltage corresponding to Y, I and Q signals.



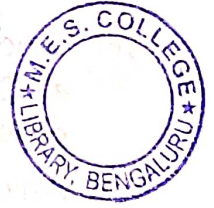
SS – 389

V Semester B.Sc. Examination, November/December 2018
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(2016 – 17 and Onwards)

ELECTRONICS – VI

EL-502 : Microprocessor and Electronic Instrumentation



Time : 3 Hours

Max. Marks : 70

Instructions : Answer *all* the questions of Part – A, *any five* questions from Part – B and *any four* questions from Part – C.

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

PART – A

(15×1=15)

1. i) In 8085 microprocessor, address bus is
a) 4 bits b) 8 bits c) 16 bits d) 32 bits
- ii) The instruction which rotates the contents of accumulator one bit to the right including carry
a) RRC b) RAR c) RLC d) RAL
- 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 and flag register b) H and L register
c) Accumulator and instruction register d) B and C register
- v) The relation among instruction cycle, fetch cycle and execution cycle is
a) Execution cycle = Instruction cycle + 2 Fetch cycle
b) Instruction cycle = Fetch cycle – Execution cycle
c) Instruction cycle = Fetch cycle + 2 Execution cycle
d) Instruction cycle = Fetch cycle + Execution cycle
- vi) The stack used in 8085 microprocessor is
a) LIFO b) LILO c) FIFO d) FILO

P.T.O.



- vii) Execution of the instruction INX B affects
- a) Only carry flag
 - b) Both carry and zero flag
 - c) No flags
 - d) All flags
- viii) Which interrupt has the highest priority ?
- a) INTR
 - b) TRAP
 - c) RST 6.5
 - d) RST 7.5
- 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) The principal ion that is not involved with the phenomena of producing cell potentials is
- a) sodium
 - b) potassium
 - c) chlorine
 - d) hydrogen
- xiv) Electrodes to measure EEG are placed on
- a) chest
 - b) scalp
 - c) cheek
 - d) ears
- xv) Recording of electrical activities associated with the heart is known as
- a) EEG
 - b) EOG
 - c) EMG
 - d) ECG

PART – B

(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. i) What is an instruction cycle ?
ii) With timing diagram, explain the opcode fetch machine cycle in 8085 microprocessor.

(2+5)



5. i) Mention the 16-bit registers of 8085 microprocessor.
ii) Draw the flag register format and explain their functions. (2+5)
6. With necessary diagram, explain the interfacing of seven segments LED with 8085 microprocessor.
7. What is a strain gauge ? Explain the construction and working of foil strain gauge.
8. a) What is the importance of signal conditioning in the field of instrumentation ?
b) What is a carrier amplifier ? With a block diagram, explain its operation. (2+5)
9. Write a note on the origin of bio-electric signals.

PART – C

(4×5=20)

10. Explain the following instructions :
 - i) LXI H 9000
 - ii) LHLD 9000
 - iii) XRA A.
 11. Calculate the time delay for the following program with 5 MHz clock frequency.

LXI B, 1234	10 T states
BACK : DCX B	05 T states
MOV A, C	05 T states
ORA B	04 T states
JNZ BACK	10/7 T states
 12. Write an assembly language program to find the sum of two 16-bit numbers in 8085 microprocessor.
 13. Write the control word of 8255 to program it in mode 0.
Port A = Input port, Port B = output port, Port CU = Input port and Port CL = Output port.
 14. In a certain current measurement system, the current to be measured is 25 mA, whereas the measurement yields a current of 22 mA. 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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