SN – 394

V Semester B.Sc. Examination, November/December 2017
(Semester Scheme) (CBCS) (F + R)
(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-divisions : **(15×1=15)**

1. i) Thermal noise is also known as
   a) Johnson noise b) Partition noise
   c) Solar noise d) Flicker noise

   ii) Indicate the false statement. The SWR on a transmission line is infinity, the line is terminated in
   a) a short circuit b) a complex impedance
   c) an open circuit d) a pure reactance

   iii) A transmission is distortion less in a T-line, if
   a) RL=1/GC b) RL=GC
   c) GL=RC d) RG=LC

   iv) In a conventional AM broadcasting system, what is the maximum transmission efficiency of an AM signal ?
   a) 64.44% b) 56.66%
   c) 33.33% d) 75.55%

   v) The modulation technique that uses the minimum channel bandwidth and lesser transmitted power is
   a) FM b) DSB-SC
   c) DSB-FC d) SSB-SC

vi) Amplitude limiter in FM receivers are used to
   a) Remove amplitude variations due to noise
   b) Filtration
   c) Demodulation
   d) Amplification

vii) The standard value for Intermediate Frequency (IF) in AM receivers is
   a) 455 KHz
   b) 580 KHz
   c) 10.7 MHz
   d) 50 MHz

viii) Sensitivity is defined as
   a) Ability to receiver to amplify weak signals
   b) Ability to reject unwanted signals
   c) Ability to convert incoming signal into Image frequency
   d) Ability to reject noise

ix) The image frequency of a superheterodyne receiver
   a) is created within the transmitter
   b) is due to insufficient adjacent channel rejection
   c) is not rejected by the IF tuned circuits
   d) is independent of the frequency to which the receiver is tuned

x) Which of the statement is not true for non-resonant antenna ?
   a) It is open-circuited at the far end
   b) It has no standing wave pattern
   c) Antenna has maximum directive gain
   d) Its radiation pattern is unidirectional

xi) Electrical length of an antenna is
   a) equal to its physical length
   b) smaller than its physical length
   c) greater than its physical length
   d) any of the above

xii) Smaller the beam width angle
   a) smaller the directivity
   b) higher the directivity
   c) higher the power gain
   d) directivity is zero

xiii) In European TV system, Field frequency is
   a) 50 fields/sec
   b) 30 fields/sec
   c) 75 fields/sec
   d) 90 fields/sec

xiv) Identify the standard aspect ratio in PAL TV system
a) 5 : 2 b) 2 : 3 c) 4 : 3 d) 5 : 9

xv) Interlaced scanning is used, in order to
a) increase the brightness of image
b) decrease the brightness of image
c) avoid flickering of image
d) increase the contrast in the image

PART – B

Answer **any five** questions : **(5×7=35)**

2. a) Define :
i) Signal to Noise ratio.
ii) Noise Figure.
b) Explain the propagation of electromagnetic waves as ground waves. **(2+5)**

3. a) Define frequency modulation. Draw relevant waveform.
b) Derive an expression for the instantaneous voltage of an AM signal. **(2+5)**

4. a) Mention the advantages of FM over AM.
b) Draw the block diagram of FM transmitter and explain the function of each block. **(2+5)**

5. Draw the circuit diagram of a slope detector and explain its working by drawing waveforms at each stage. **7**

6. a) Draw the block diagram of AM superheterodyne receiver and explain the function of each block.
b) Define the terms 'Sensitivity and Fidelity' with respect to a radio receiver. **(5+2)**

7. a) Define :
i) Directive gain.
ii) Power gain with respect to an antenna.
b) Derive an expression for the total power radiated by an antenna. **(2+5)**

8. a) Explain the effects of grounded antennas.
b) What are blanking and synchronizing pulses in TV system ? **(3+4)**

9. a) Draw the schematic diagram of a Videocon camera tube and explain its working.
b) Write a note on concept of CCTV. **(5+2)**

PART – C

Answer **any four** questions. **(4×5=20)**

10. A transmission line has a characteristic impedance of 300 Ω. Calculate the reflection coefficient and VSWR when the line is terminated by (a) 600 Ω resistor and (b) 400 Ω resistor.

11. A Sinusoidal carrier frequency of 1.2 MHz is amplitude modulated by a sinusoidal voltage of frequency 20 KHz resulting in maximum and minimum modulated carrier amplitude of 110 V and 90 V respectively. Calculate :
    i) Frequency of lower and upper side bands.
    ii) Unmodulated carrier amplitude.
    iii) Modulation index.
    iv) Amplitude of each side band.

12. The equation for an FM wave is given by
    $V_{FM} = 10 \sin [3.14 \times 10^8 t + 5 \sin (6.28 \times 10^3 t)]$ volts.
    Calculate :
    i) Carrier frequency
    ii) Modulation frequency
    iii) Modulation index
    iv) Frequency deviation.

13. Draw the block diagram of FM superheterodyne receiver and explain the function of each block.

14. Find the radiation resistance of a dipole antenna $\lambda/6$ long, also find the antenna efficiency if the ohmic loss resistance of the dipole antenna is 2 Ω.

15. In a colour TV system the signal voltages corresponding to the three primary colours are given as green = 3 m V, blue = 2 mV and red = 1mV. What are the voltages corresponding to Y, I and Q signals ?

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V Semester B.Sc. Examination, November/December 2017
(Semester Scheme) (CBCS) (F + R)
(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 evaluation.*

PART – A

Answer **all** subdivisions. **(15×1=15)**

1. i) Memory capacity of a microprocessor depends on
   a) Data bus width b) Address bus width
   c) Word size d) a) and b)

   ii) LHLD is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) All the above

   iii) What is the content of accumulator when XRA A instruction is executed ?
   a) 00H b) 01H
   c) 10H d) FFH

   iv) Multiplication in 8085 μP is performed by
   a) Successive subtraction b) Successive addition
   c) Successive division d) None of the above

   v) The stack pointer is a
   a) 8 bit b) 16 bit
   c) 4 bit d) None of these

   vi) Which interrupt has the lowest priority ?
   a) INTR b) TRAP
   c) RST 6.5 d) RST 7.5

P.T.O.

vii) Interfacing IC 8279 is also known as
a) Programmable peripheral interface
b) Keyboard/Display Interface
c) DMA controller
d) Both b) and 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) Thermistors are used for the measurement of
a) Sound
b) Displacement
c) Humidity
d) Temperature

x) The example for photo electric transducer is
a) Thermistor
b) LDR
c) Microphone
d) LVDT

xi) Bioelectric potentials are generated at
a) Neurons
b) Blood
c) Cellular level
d) None of these

xii) The limb electrode can be replaced by _____ in ECG.
a) Floating electrode
b) Needle electrode
c) Pasteless electrode
d) None of the above

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 depolarized cell potential is
a) – 20 mV
b) – 40 mV
c) + 90 mV
d) + 60 mV

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 μP and explain the function of accumulator and Program Counter Register.
3. Explain the various addressing modes of 8085 Microprocessor with examples.
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
   iv) Accuracy
   v) Expected value

   b) Write any two differences between active and passive transducers. **(5+2)**
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
    a) MOVA, M
    b) ADD B
    c) RAL
    d) JNZ 16 bit address
    e) NOP.
11. Write an assembly language program to add two BCD numbers.

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 3 MHz clock.

Label	Mnemonic	T-states
	MVI B, 1AH	07
loop	DCR B	04
	JNZ loop	10/7
	NOP	04
	NOP	04
	RET	10

14. The expected value of the current to be measured is 100 mA. However the measurement gives the value of 98 mA. Calculate the relative accuracy, percentage accuracy and error.

15. With a block diagram, explain the working of EEG.