

VI Semester B.Sc. Examination, September 2020  
(CBCS) (F+R) (2016-17 and Onwards)

ELECTRONICS – VII  
Communication – II

Time : 3 Hours

Max. Marks : 70

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

**Note :** It is required to answer *all* the questions of Part – A in *any one* page. Answering the *same* questions multiple times will *not* be considered for evaluation.

PART – A

Answer *all* the subdivisions :

(15×1=15)

1. i) In a 7-bit PCM system, the number of amplitude levels transmitted are \_\_\_\_\_  
a) 32                      b) 64                      c) 128                      d) 256
- ii) In digital communication, Baud rate is  
a) Number of symbols per second  
b) Number of bits per second  
c) Number of bytes per second  
d) Number of ASCII characters per second
- iii) In a communication system, the modem that can support the data transmission in both directions, but not at the same time, is \_\_\_\_\_  
a) Simplex  
b) Half-duplex  
c) Full-duplex  
d) All of the above
- iv) In a radar system the strength of a transmitted signal is \_\_\_\_\_  
a) Less than that of a received signal  
b) Almost equal to that of received signal  
c) Much higher than that of received signal  
d) None of the above

P.T.O.



- v) Duplexer is
- a) an oscillator
  - b) a microwave switch
  - c) an amplifier
  - d) both a) and b)
- vi) When the target is moving away from the source, the received apparent frequency is \_\_\_\_\_ the transmitted frequency.
- a) Higher than
  - b) Lower than
  - c) Same as
  - d) Both a) and c)
- vii) A communication satellite acts as a repeater between \_\_\_\_\_
- a) a transmitting station and a receiving station
  - b) a transmitting station and many receiving stations
  - c) many transmitting stations and many receiving stations
  - d) all of the above
- viii) A satellite up-link means \_\_\_\_\_
- a) Earth – to – Satellite link
  - b) Satellite – to – Satellite link
  - c) Satellite – to – Earth link
  - d) None of the above
- ix) The bandwidth of C-band satellite frequency band is \_\_\_\_\_
- a) 500 KHz
  - b) 500 MHz
  - c) 500 GHz
  - d) 500 THz
- x) Optical fiber operates on the principle of \_\_\_\_\_
- a) Total internal reflection
  - b) Photo-electric effect
  - c) Photo-voltaic effect
  - d) Laser technology
- xi) The optical fibre cables are preferred over copper cable because of \_\_\_\_\_
- a) Small size
  - b) Extremely wide bandwidths
  - c) Immunity to electromagnetic interference
  - d) All the above
- xii) The abrupt change in refractive index from core to cladding of optical fibre cable is called \_\_\_\_\_
- a) Acceptance cone angle
  - b) Numerical aperture
  - c) Graded index
  - d) Step index
- xiii) \_\_\_\_\_ is the process of subdividing a congested cell into smaller cells.
- a) Cell splitting
  - b) Cell merging
  - c) Frequency reusing
  - d) Both a) and c)

- xiv) The main advantage of CDMA over GSM is \_\_\_\_\_
- a) Faster data transfer
  - b) Requires SIM
  - c) FDMA and TDMA friendly
  - d) Roaming worldwide available
- xv) If the data speed is 300 Mbps, then the technology belongs to \_\_\_\_\_
- a) 2G
  - b) 3G
  - c) 4G
  - d) 5G

## PART – B

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

2. a) State sampling theorem.  
b) Define PWM and draw its input and output waveforms.  
c) Define PSK and draw its input and output waveforms. (2+3+2)
3. a) Explain, briefly Echo suppressors.  
b) Explain the basic principle of RADAR system with a block diagram. (3+4)
4. Explain the detailed block diagram of FMCW radar system. 7
5. a) With a block diagram, explain satellite uplink system.  
b) Explain the effect of solar eclipse on satellite system. (5+2)
6. a) Explain briefly a Satellite parabolic dish antenna.  
b) Draw the block diagram of optical fiber communication system. (3+4)
7. a) What are the requirements of light sources in OFC ?  
b) Explain the operation of a semiconductor LASER diode. (2+5)
8. a) Explain briefly Rayleigh scattering and absorption losses in OFC.  
b) Explain briefly frequency reuse and handoff process in cellular system. (3+4)
9. Explain the simplified block diagram of cellular phone handset. 7





## PART – C

Answer any four questions.

(4×5=20)

10. A mobile communication channel has a bandwidth of 1.4 MHz and S/N of 40 dB, calculate its information capacity. What will be the bandwidth required to support the data rate of 50 Mbps over the same channel ?
11. Calculate the maximum range of a radar system which operates at 6 cm with a peak value of pulse power as 750 kW, if its minimum receivable power is  $10^{-13}$  W, the capture area of its antenna is  $5 \text{ m}^2$  and radar cross-sectional area of the target is  $15 \text{ m}^2$ .
12. With a block diagram, explain MTI Radar system.
13. Explain the block diagram of satellite C-band Transponder.
14. An optical fiber is made up of a glass core with refractive index is 1.55 and the clad with another glass of refractive index 1.52, launching takes place from air. Calculate numerical aperture and acceptance angle.
15. List and explain the major components of local area networks.



SE – 207

VI Semester B.Sc. Examination, September 2020  
CBCS (F+R) (2016-17 & Onwards)  
ELECTRONICS – VIII  
Microcontrollers

Time : 3 Hours

Max. Marks : 70

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

**Note :** It is required to answer *all* questions of Part – A in *any one*-page. Answering the same questions multiple times will not be considered for evaluation.

PART – A

Answer *all* the questions.

(15×1=15)

1. i) Pull-up resistor is essential for \_\_\_\_\_ in 8051 for its operation.  
a) Port 0                      b) Port 1                      c) Port 2                      d) Port 3
- ii) The 8051 has \_\_\_\_\_ 16 bit Counter/Timers.  
a) 1                              b) 2                              c) 3                              d) 4
- iii) The upper 128 bytes of an internal data memory from 30 H through 7 FH usually represent  
a) general-purpose registers.                      b) special function registers  
c) stack pointers                                      d) program counters
- iv) \_\_\_\_\_ flags represent the least significant bit and most significant bit of Program Status Word respectively.  
a) Parity Flag and Carry Flag  
b) Parity Flag and Auxiliary Carry Flag  
c) Carry Flag and Overflow Flag  
d) Carry Flag and Auxiliary Carry Flag
- v) SP of 8051 is of \_\_\_\_\_ wide and it is loaded with the default value of \_\_\_\_\_ after reset.  
a) 2 byte, 08 H                                      b) 8 bit, 07 H  
c) 1 byte, 09 H                                      d) 8 bit, 06 H

P.T.O.



- vi) The various ways of specifying data are called  
a) Addressing modes                      b) Calling  
c) Conditional jumps                      d) Interrupts
- vii) \_\_\_\_\_ is the maximum capacity of off-chip data memory.  
a) 32 K                      b) 16 K                      c) 64 K                      d) 4 K
- viii) The highest priority interrupt in 8051 is  
a) TF1                      b) RESET                      c) INT0                      d) INT1
- ix) The contents of the accumulator after this operation  
MOV A, #0BH  
ANL A, #2CH will be  
a) 11010111                      b) 11011010                      c) 00001000                      d) 00101000
- x) The 8-bit address bus allows access to an address range of  
a) 0000 to FFFFH                      b) 000 to FFFFH  
c) 00 to FFH                      d) 0 to FH
- xi) The content of P1 after executing the following instruction is \_\_\_\_\_  
P1 = 0x77 >> 3.  
a) 77                      b) 0E                      c) 3B                      d) 1D
- xii) The size of SFR (Special Function Register) data type used in 8051 C is  
a) 4 bytes                      b) 2 bytes                      c) 3 bytes                      d) 1 byte
- xiii) ADC0848 is a \_\_\_\_\_ bit converter.  
a) 16                      b) 4                      c) 8                      d) 48
- xiv) The address in the interrupt vector table assigned to IE0 is  
a) 0000H                      b) 0003H                      c) 000BH                      d) 0013H
- xv) In PIC 16F877A, there are \_\_\_\_\_ ports.  
a) 2                      b) 3                      c) 4                      d) 5

## PART – B

Answer **any five** questions.

(7×5=35)

2. With a neat block diagram, explain the internal architecture of 8051.
3. Explain the internal RAM organization of 8051 microcontroller.
4. With an example explain all the arithmetic instructions of 8051 microcontroller.





5. a) Explain the operations of the following 8051 instructions.
- |               |                 |
|---------------|-----------------|
| (i) DA A      | (ii) RR A       |
| (iii) ANLC,/b | (iv) XCHD A,@R0 |
- b) Explain PUSH and POP instructions with respect to 8051. (4+3)
6. Explain short absolute, long absolute and relative jump instructions in 8051.
7. Explain the different data types used in 8051 C programming.
8. With a diagram explain the interfacing of ADC to 8051 microcontroller.
9. a) Draw the bit pattern of IE register.
- b) List the features of PIC 16F877A microcontroller. (2+5)

PART – C

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

10. Draw the bit structure of TMOD register in 8051 and mention the function of each bit.
11. Write a program to perform the addition of two 16 bit numbers which are stored in memory locations and store the result in next memory locations.
12. Write an assembly language program to find the smallest in an array of TEN 8 bit numbers.
13. What will be the content of R3 after the execution of following instructions ?  
MOV R3, A  
MOV A, #65H  
RL A  
ANL A,#FFH,  
SWAP A  
MOV R3, A
14. Write a 8051 C program to accept a byte of data from Port 1 and wait it for 250 ms send it to Port 2.
15. Explain how to interface LCD with PIC 16F87A microcontroller.
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