

**BACHELOR OF PHYSIOTHERAPY  
FIRST SEMESTER  
MECA & BASIC ELECTROTHERAPY  
BPT – 103 [REPEAT]  
(USE OMR SHEET FOR OBJECTIVE PART)**

**SET  
A**

Duration : 3 hrs.

Full Marks : 70

Time : 30 min.

( Objective )

Marks : 20

*Choose the correct answer from the following:*

*1×20=20*

1. According to KCL,
  - a.  $\sum I=1$
  - b.  $\sum I=2$
  - c.  $\sum I=0$
  - d.  $I=0$
2. KVL can be applied to
  - a. Closed path
  - b. Open path
  - c. Both (a) & (b)
  - d. None of these
3. Transistor is a
  - a. Three junction device
  - b. Two junction device
  - c. Uni-junction device
  - d. All of these
4. In case of conductor, the forbidden energy band is
  - a. Large
  - b. Very large
  - c. Small
  - d. Negligible
5. CPU consists of
  - a. ALU & Memory
  - b. ALU & Control Unit
  - c. Control Unit & Memory
  - d. All the above
6. How many NAND gates are required to construct an AND gate?
  - a. 3
  - b. 2
  - c. 4
  - d. 1
7. In 4:1 MUX, the number of select line is
  - a. 2
  - b. 3
  - c. 1
  - d. 4
8. Voltage division rule is applicable to
  - a. Series Circuit
  - b. Parallel Circuit
  - c. Both (a) & (b)
  - d. All the above
9. DEMUX is also called
  - a. Data selector
  - b. Data distributor
  - c. Data analyzer
  - d. All the above

10. If a wire having length 2m and area  $4\text{m}^2$  has a resistance of 8 Ohm. Its resistivity is
- 8 ohm-m
  - 16 ohm-m
  - 20 ohm-m
  - 4 ohm-m
11. Binary equivalent of the number  $(25)_{10}$  is
- 10101
  - 11011
  - 11001
  - 01111
12. Diode is a
- Three terminal device
  - Two terminal device
  - One terminal device
  - None of these
13. The 2's complement of the number 10101101 is
- 01010010
  - 11010010
  - 01010011
  - 11101111
14. The hexadecimal form of the binary number 11111011 is
- A3
  - AF
  - FA
  - FB
15. Which of the following is responsible for arithmetic and logical operations?
- ALU
  - Memory
  - Control Unit
  - All the above
16. Monitor is an example of
- Input Device
  - Storage device
  - Memory device
  - Output device
17. If two voltages of values 18 V and 12 V are connected in series opposing circuit, the net voltage will be
- 18 V
  - 12 V
  - 30 V
  - 6 V
18. Full Adder performs binary addition operation of
- 3 bits
  - 2 bits
  - 1 bits
  - 7 bits
19. The electronic circuit that converts AC to DC is called
- Converter
  - Amplifier
  - Rectifier
  - Clipper
20. The main feature of 2<sup>nd</sup> generation of computer is
- Transistor
  - Vacuum tube
  - IC
  - AI

**( Descriptive )**

Time : 2 hrs. 30 min.

Marks : 50

**[ Answer question no.1 & any four (4) from the rest ]**

1. Discuss the features, advantages and disadvantages of generation of computer. 10
  
2. Define Kirchhoff's laws. Two resistors of values  $14\Omega$  and  $10\Omega$  are connected across a voltage source of 6V. Another  $10\Omega$  resistor and 5V voltage source are connected across the previous combination. Find the values of current flowing in the two mesh formed. 10
  
3.
  - a. Explain with the help of block diagram the architecture of computer. 5+5=10
  - b. Design a half-subtractor with the help of truth table.
  
4.
  - a. Design a Full Adder circuit with the help of truth table. 7+3=10
  - b. Subtract  $(15)_{10}$  from  $(10)_{10}$  in 2's complement method.
  
5. What do you mean by Multiplexer? Design a 4:1 MUX with the help of truth table. 10
  
6.
  - a. Explain with the help of diagram  $1 \times 2$  DEMUX. 5+5=10
  - b. Differentiate between Semiconductor, Conductor and Insulator.
  
7.
  - a. What is a transistor? What are the various configurations of transistors? Explain with the help of diagram. 6+4=10
  - b. In a circuit, if series opposing voltages are 12 V and 6 V and two resistors of values  $4\Omega$  &  $8\Omega$  are connected in series, then compute
    - (i) Circuit current
    - (ii) Power supplied by the two batteries
    - (iii) Power dissipated in two resistors

8. a. Find the binary equivalent of the decimal number  $(13.25)_{10}$ .  $2.5+2.5$   
b. Convert  $(11011.1011)_2$  into decimal.  $+5=10$   
c. Write short notes on half wave rectifier.

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