18CHP04/14CHP04

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch - **CHEMISTRY**

BASIC ELECTRONICS FOR CHEMISTS

Time : Three Hours Maximum : 75 Marks

SECTION-A (10 Marksl

Answer **ALL** questions

ALL questions carry **EQUAL** marks **(10 x 1 = 10)**

1 Which of the following is a passive component?
(i) Resistor (ii) Capacitor
(iii) Inductor (iv) All the above

2 What is the rectification efficiency of full wave rectifier?
(i) 24% (ii) 40.6%
(iii) 81.2% (iv) 100%

3 Which of the ideal parameter of the op-amp is correct?
(i) High input impedance and low output impedance
(ii) High input impedance and high output impedance
(iii) Low input impedance and low output impedance
(iv) Low input impedance and high output impedance

4 How many comparators are available in 555 timer?
(i) 2 (ii) 3
(iii) 4 (iv) 5

5 Which gate is called as universal gate?
(i) NOR gate (ii) NAND gate
(iii) Both (i) & (ii) (iv) None of the above

6 Which flip flop avoids the forbidden condition?
(i) RS flip flop (ii) Clocked RS flip flop
(iii) D flip flop (iv) None of the above

7 What is the other name of BCD counter?
(i) Binary counter (ii) Ring counter
(iii) Decade counter (iv) None of the above

8 What is the disadvantage of weighted resistor type D/A converter?
(i) Each input terminal has different value of resistors
(ii) Current flows in MSB bit is much larger than LSB bit
(iii) Both (i) & (ii) (iv) None of the above

9 What is the instrument used for measuring hydrogen - ion activity in water-based solution?
(i) pH meter (ii) Conductivity bridge
(iii) Spectrophotometer (iv) None of the above

10 What is the working principle of voltmeter?
(i) Connected in series with components (ii) Connected in parallel with component
(iii) Both (i) and (ii) (iv) None of the above

SECTION - B (25 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 5 = 25)

11 a Explain the Intrinsic Semiconductor.

OR

b Describe the behaviour of a PN junction under forward and reverse biasing.

12 a Explain the Inverting amplifier.

OR

b With a neat sketch, explain the working of Astable Multivibrator.

13 a Convert octal number to decimal number : (i) (133)g (ii) $(372)_8$

OR

b Explain the function of AND gate with truth table.

14 a Explain the Asynchronous counter.

OR

b What is Ring counter? Explain the working principle of ring counter.

15a What is a voltmeter? How does it work?

OR

b Elucidate the Potentiometer.

SECTION -C (40 Marks!

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 8 = 40)

16 a Explain a half-wave rectifier using junction diode.

OR

b What is a Zener diode? Explain the working principle of zener diode.

17 a Discuss the operation of op-amp differentiator.

OR

b Elucidate the application of Automatic Street light.

18a Explain the operation of Full adder.

OR

b Discuss the JK master slave Flip Flop.

19 a Describe the Binary weighted D/A converter.

OR

b Explain the operation of binary up/down counter.

20 a Briefly explain the construction and working of a spectro photometer.

OR

b Discuss the Pan Balance digital thermometer.

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END