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BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Sc.(ANCS)-Hons-2023/B.Sc.(ANCS)-Hons-2024
Course Name – Fundamentals of Electronics
Course Code - BNC10001
(Semester I)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify is the primary function of a resistor in an electronic circuit?
a) To amplify signals b) To store electrical energy
c) To provide resistance to the flow of current d) To regulate voltage levels

(ii) Calculate the current flowing through a 220-ohm resistor when connected to a 12-volt power supply using Ohm's Law (V = IR).
a) 0.0545 A b) 2.73 A
c) 5.0 A d) 16.4 A

(iii) Choose the basic property of a semiconductor material?
a) High conductivity b) Zero resistance
c) Intermediate conductivity d) Perfect insulating properties

(iv) Identify the semiconductor device which is commonly used as an amplifier in electronic circuits?
a) Transistor b) Diode
c) Capacitor d) Resistor

(v) Choose the correct alternative of zener diode in case of voltage regulation
a) Operational Amplifier b) MOSFET
c) Integrated Circuits d) None of these

(vi) Recognize the advantages of a junction transistor over the vacuum triode is_____.
a) high power consumption b) High efficiency
c) large size d) Less doping

(vii) Determine in an NPN transistor symbol, the arrow is pointed towards
a) the collector b) The base
c) the emitter d) Depends on the configuration

(viii) The transfer of a signal in a transistor is _____.
a) low to high resistance b) High to low resistance
c) collector to base junction d) Emitter to base junction

(ix) Determine the octal equivalent of the binary number: 10111101

a) 675 b) 275
c) 572 d) 573

(x)

How many AND gates are required to construct the Boolean expression, ?

a) 1 b) 2
c) 3 d) 4

(xi) Choose When an input signal 1 is applied to a NOT gate, the output is

a) "0" b) "1"
c) Either "0" or "1" d) None of these

(xii) The binary equivalent of the decimal number 10 is

a) 1010 b) 10101
c) 10011 d) None of these

(xiii) Determine the select lines of 16 to 1 multiplexer

a) 4 b) 3
c) 5 d) 1

(xiv) Calculate minimum number of 4-to-1 multiplexers required to realize a 16-to-1 multiplexer is

a) 3 b) 4
c) 5 d) 8

(xv) When an inventer is placed between the inputs of an S-R flip-flop for creating a new flip-flop which is known as

a) J-K flip-flop b) master-slave flip-flop
c) T flip-flop d) D flip-flop

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Write the applications of BJT? (3)
3. If you have a circuit with a voltage of 12V and a resistor of 100 ohms, can you calculate the power dissipation? (3)

4. (a) Identify the decimal equivalent number of an octal number 512. (3)
(b) Identify the binary equivalent number of an octal number 736.

5. Apply Boolean algebra to simplify the expression (3)

$$Y = (\overline{A} + B) \cdot (A + B)$$

6. Discriminates between combinational circuit and sequential circuit. (3)

OR

Discriminate between latch & flip flop. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain Commutative law, Associative law, Distributive law related to Boolean algebra. (5)

8. Explain three terminals of a transistor. (5)

9. In a common base connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current. (5)

10. Describe NOR gate and demonstrate the action of NOR gate as Universal gate. (5)

11. Compare Zener breakdown and Avalanche breakdown. (5)

12. Explain half subtractor with its block diagram, truth table and circuit diagram by using logic gates. (5)

OR

Explain Full-Adder. (5)

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