18191

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – B.Tech.(CSE)-AIML-2024/B.Tech.(CSE)-DS-2024/B.Tech.(BT)-2024/B.Tech.(CSE)-CYS-2024/B.Tech.(BT)-2025/B.Tech.(CSE)-CYS-2025/B.Tech.(CSE)-DS-2025
Course Name – Basic Electrical and Electronics Engineering
Course Code - BES00002
(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) Indicate the correct option : Bipolar Junction Transistor is

a) Current controlled device b) Voltage controlled device
c) Unipolar device d) None of these

(ii) Identify the law on which the transformer works;

a) Faraday's law of electromagnetic induction b) Fleming's right-Hand Rule
c) Fleming's left-hand rule d) None of these

(iii) Choose the unit of Resistance from the following:

a) Ohm b) Siemens
c) Ohm-meter d) None of these

(iv) Identify the material with lots of free electrons from below.

a) Conductors b) Insulators
c) Semiconductors d) Filters

(v) Select the principle behind electromagnetic induction-

a) Faraday's Law b) Coulomb's Law
c) Ohm's Law d) Kirchhoff's Law

(vi) Choose the unilateral element from below mentioned option

a) Resistor b) Diode
c) Inductor d) Capacitor

(vii) Choose the time period of a sine wave that goes through 10 cycles in 20 s;

a) 20 sec b) 4 sec
c) 2 sec d) 100 micro sec

(viii) Choose the correct option; the peak value divided by the RMS value gives us

a) Peak factor b) Crest factor

c) Both of them | d) None of peak or crest factor

(ix) Enumerate the number of terminals of a PN junction diode.

a) One | b) Three
c) Two | d) Four

(x) Identify the doping level associated with Zener breakdown in a Zener diode.

a) Lowest | b) Moderate
c) High | d) Low

(xi) Define the purpose of a rectifier.

a) Convert ac voltage to dc voltage | b) Convert dc voltage to ac voltage
c) Measure resistance | d) Measure current

(xii) Determine what happens to dynamic resistance if the slope of the I-V characteristic curve is steep.

a) It increases | b) It decreases
c) It remains the same | d) It becomes zero

(xiii) Identify that, in an NPN transistor, the arrow is pointed towards

a) the collector | b) the base
c) depends on the configuration | d) the emitter

(xiv) In the operation of an NPN transistor, indicate the region that electrons can cross:

a) emitter region | b) the region where there is high depletion
c) the region where there is low depletion | d) P type base region

(xv) Choose the three terminals of BJT

a) Emitter, Base, Gate | b) Emitter, Base, Collector
c) Base, Source, Collector | d) Source, Gate, Drain

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe the active and passive elements in a circuit. (3)
3. Compute peak factor and form factor of a AC wave. state their values for a sinusoidal AC wave. (3)
4. Explain the need for a starter in a DC motor. (3)
5. Compare a half-wave and a full-wave rectifier. (3)

6. Differentiate among Active region, Cut-off region and Saturation region at CB mode. (3)

OR

Deduce the relation between β and α. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Illustrate the Input and Output characteristics of CE configuration. (5)

8. Distinguish between intrinsic and extrinsic semiconductors and explain the term "Doping". (5)

9. A transformer core has a maximum flux density of 1.2 T. The core cross-sectional area is 50 cm^2. The primary winding has 500 turns. If the supply frequency is 50 Hz, calculate the rms value of the induced EMF in the primary winding. (5)

10. State Ohm's law. (5)

11. Define node, junction, loop and mesh of a circuit. (5)

12. For a semiconductor, the total current density is measured to be 1 A/cm². If the drift current density is found to be 0.6 A/cm², calculate the diffusion current density. (5)

OR

Explain that the drift current in a semiconductor depends on charge carrier mobility. (5)

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