BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – Dip.CSE-2022/Dip.ME-2022/Dip.RA-2022/Dip.EE-2022/Dip.CE-2022/Dip.RA-2023/Dip.CE-2023/Dip.CSE-2023/Dip.EE-2023/Dip.ME-2023

Course Name – Fundamentals of Electrical & Electronics Engineering

Course Code - ES201

(Semester II)

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 that the Kirchhoff's voltage law deals with the conservation of

a) Mass b) Energy
c) Momentum d) Charge

(ii) Select which of the following is the unit of magnetic flux density?

a) Weber b) Tesla
c) ohm d) ampere

(iii) Choose from the following: KCL can be applied at

a) Loop b) Node
c) Both loop and node d) Neither loop nor node

(iv) Choose out of the following, which one is not a source of electrical energy?

a) Solar cell b) Battery
c) Potentiometer d) Generator

(v) Identify the unit of resistance is

a) Mho b) Ohm
c) Farad d) Henry

(vi) Choose what is the value of power factor of electric bulb

a) Zero b) Lagging
c) Leading d) Unity

(vii) Choose what is the period of a wave?

a) The same as frequency b) Time required to complete one cycle
c) Expressed in amperes d) None of the above

(viii) Select the unit of admittance?

a) ohm b) henry

c) farad d) ohm-1

(ix) Choose materials which easily allow the passage of electric current are known as _____

a) Insulators b) Conductors
c) Dielectrics d) Semi-conductors

(x) Choose which of the following is not an expression power?

a) P=VI b) P=I.I.R
c) P=V.V/R d) P=I/R

(xi) Select who is responsible for the current flow.

a) Electron b) proton
c) nucleus d) none of these

(xii) Illustrate: Forward bias of a silicon P-N junction will produce a barrier voltage of approximately how many volts

a) 0.2 b) 0.3
c) 0.7 d) 0.8

(xiii) Illustrate, a current ratio of IC/IE is usually less than one and is called:

a) beta b) theta
c) alpha d) omega

(xiv) When PN junction is in forward bias, by increasing the battery voltage

a) Circuit resistance increases b) Current through P-N junction increases
c) Current through P-N junction decreases d) None of the above happens

(xv) A single-phase circuit with a power factor of 1, that indicates

a) A purely resistive circuit b) A purely inductive circuit
c) A purely capacitive circuit d) A circuit with equal real and reactive power

Group-B

(Short Answer Type Questions) 3 x 5=15

2. State Ohm's law and its limitation. (3)

3. Describe about the BH curve. (3)

4. Compare avalanche breakdown and Zener breakdown. (3)

5. Compare a half-wave and a full-wave rectifier. (3)

6. Illustrate the amplification factors for CB and CE configuration BJT and show the relationship between them. (3)

OR

Illustrate the amplification factors for CB and CC configuration BJT and show the relationship between them. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Distinguish between Drift current and Diffusion current in a semiconductor device? (5)
Distinguish between conductors, semiconductors and insulators using energy band diagrams

8. Describe the operation of circuit a Bridge rectifier with diagram. (5)

9. Explain the working of a solar cell. (5)

10. Ilustrate the losses in a transformer. (5)

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

12. A small, negligible current is passed through a wire of length 15 meters with a uniform cross-sectional area of 6×10^{-7} sq. m. Its resistance is measured to be 5 ohms. Calculate the (a) resistivity of the material, and (b) conductivity of the material. (5)

OR

A coil of wire has 50 turns and its area is 500 sq. cm. It is rotating at the rate of 50 rounds per second at right angles to a magnetic field of 0.5 T. Calculate the maximum e.m.f. induced in the coil. (5)

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