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Code : 15EC01T

Register Number

I Semester Diploma Examination, Oct./Nov.-2021

CONCEPTS OF ELECTRICAL AND ELECTRONICS ENGINEERING

: 3 Hours]

[Max. Marks : 100

Note : Students can answer for max. of 100 marks, selecting any subsection from any main section.

PART – A

Define the following & mention their units. 5
(i) Electric current
(ii) Electro Motive Force (EMF)

State Kirchoff's laws 5
(i) Current law
(ii) Voltage law

Define : 5
(i) Absolute permeability
(ii) Relative permeability

Draw the sine wave curve & mark the following : 5
(i) Cycle
(ii) Time period
(iii) Maximum value

Define RMS value & average value with reference to the AC sine wave current. 5

List the important applications of stepper motor. 5

Classify the switches based on their operation. 5

Draw & explain the V-I characteristics of P-N junction diode. 5

Define : 5
(i) Ripple factor
(ii) Efficiency (n) of a rectifier

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PART – B

10. (a) State the laws of resistance & write their equation
    (b) Derive formula to find equivalent resistance, when three resistors are connected in parallel.

11. (a) Differentiae between an electromagnet & permanent magnet.
    (b) Define the following :
       (i) Form factor
       (ii) Average value

12. (a) An inductive coil of 0.2 H & a capacitor of 50 μFD are connected in series to 200 V, 50 Hz supply
       Find
       (i) Inductive reactance (X_L) and
       (ii) Capacitive reactance (X_C)
    (b) Show that average current of sinusoidal AC is equal to $0.637 \, I_M$.

13. (a) Define.
       (i) Leading power factor
       (ii) Lagging power factor
    (b) A coil of 10Ω resistance & 31.4Ω inductive reactance is connected in series with capacitor of 6.4Ω reactance. Find impedance (Z) of this circuit.

14. (a) List the types of stepper motor & give the any three advantages.
    (b) What do you mean by a fuse & mention the main types of fuses that are normally used.

15. (a) Classify the relays based on their principle of operation.
    (b) What do you mean by
       (i) Forward bias
       (ii) Reverse bias
       as applied to diode.

16. With neat ckt diagram & wave form, explain the working of a full wave bridge rectifier.

17. (a) With neat circuit diagram explain the operations of a transistor as an amplifier
    (b) Give any two applications of a transistor.

18. With neat circuit diagram explain the working of a Zener Diode voltage regulator.

19. (a) With neat block diagram explain the function of an Op-amp.
    (b) List any three advantages of an Op-amp.

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