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Question Paper Code: R2326

B.E. / B.Tech. DEGREE EXAMINATION, APRIL/ MAY 2025

Second Semester

Civil Engineering

R21UEE226 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Regulations R2021)

(Common to Mechanical, Agricultural and Chemical Engineering branches)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. Ohm's law is not applicable to CO1-U
(a) Resistor (b) Inductor (c) Capacitor (d) Battery
2. Ohm's law is stated as CO1-U
(a) $V = IR$ (b) $R = VI$ (c) $I = VR$ (d) $V = I^2R$
3. Load saturation characteristics of a d.c. generator gives relation between _____ CO1-U
(a) V and I_a (b) E and I_a (c) E_o and I_f (d) E and I_f
4. In a d.c. generator, the generated e.m.f. is directly proportional to the _____. CO1-U
(a) Voltage and current are out of phase. (b) Current leads the voltage by 90°
(c) Voltage and current are in phase. (d) Voltage lags behind the current by 90°
5. A capacitor start, capacitor run single phase induction motor is basically a CO1-U
(a) ac series motor (b) dc series motor
(c) 2 phase induction motor (d) 3 phase induction motor
6. A single phase motor generally used for small air compressor is CO1-U
(a) capacitor start capacitor run motor (b) reluctance motor
(c) universal motor (d) shaded pole motor
7. Speed of the universal motor is CO1-U
(a) Dependent on frequency of supply (b) Proportional to frequency of supply
(c) Independent of frequency of supply (d) None of the above

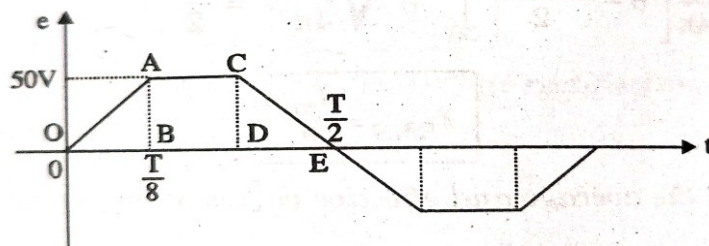
8. Which motor is relatively free from mechanical and magnetic vibrations? CO1-U
 (a) Shaded-pole motor (b) Universal motor
 (c) Reluctance motor (d) Hysteresis motor
9. The majority carriers of P-type semiconductor are _____. CO1-U
 (a) Electrons (b) Holes (c) Electron-hole pair (d) All of the above
10. CE configuration of BJT is used for _____ applications CO1-U
 (a) high frequency (b) low frequency (c) audio frequency (d) impedance matching

PART – B (5 x 2= 10 Marks)

11. Briefly explain RMS Value and Form Factor. CO1 U
12. What is the purpose of a commutator in a DC machine? CO1-U
13. List the application of induction motor. CO1 U
14. Identify common applications of a universal motor. CO1 U
15. What is a DAC? Explain the different types of DACs. CO1 U

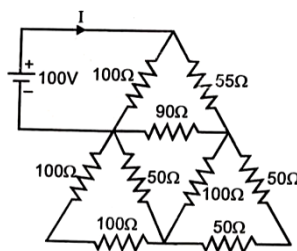
PART – C (5 x 16= 80 Marks)

16. (a) Solve the below circuit to find the average value, rms value and CO2-App (16)
 form factor , peak factor of a periodic wave having the following
 values .



Or

- (b) Determine the equivalent resistance between terminals A and B of CO2-App (16)
 the given figure by applying the appropriate method and find the
 total current taken from the source.



17. (a) Develop emf equation and Explain briefly about the construction of a DC Machines. CO1- U (16)
- Or
- (b) Elucidate the construction of a Single phase Transformer with a neat sketch. CO1- U (16)
18. (a) Apply the working principle to explain how a capacitor start capacitor run induction motor operates. CO3-App (16)
- Or
- (b) Apply your knowledge to explain how the construction of a synchronous motor influences its operation. CO3-App (16)
19. (a) Describe the modes of operation of a hybrid stepper motor and illustrate its applications. CO1- U (16)
- Or
- (b) Discuss the construction, working principle, and applications of an AC servo motor. CO1- U (16)
20. (a) Examine the operation of a BJT in common base (CB) configuration and analyze its input and output characteristics. CO4- Ana (16)
- Or
- (b) Examine and analyze the operation of dual slope and parallel approximation types of ADCs with relevant diagrams. CO4- Ana (16)

