A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: R2326

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Second Semester

Civil Engineering

R21UEE226- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Regulations R2021)

(Common to MECH,AGRI & CHEMICAL Engineering branches)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. Resistance of a wire is directly proportional to its CO1-U

   (a) Length (b) Diameter (c) Area of cross section (d) All of the above

2. Which one is considered as active element? CO1- U

   (a) Resistor (b) Inductor (c) Capacitor (d) Battery

3. What is the relationship between speed, back emf and flux? CO1-U

   (a) $N= E_b \Phi$ (b) $N = \Phi / E_b$ (c) $N\alpha E_b /\Phi$ (d) $\Phi \alpha N E_b$

4. In a d.c. generator, the generated e.m.f. is directly proportional to the--- CO1-U

   (a) Field current (b) Pole flux

   (c) Number of parallel path (d) Number of dummy coils

5. A capacitor start single phase induction motor is switched on the supply with its capacitor replaced by an inductor of equivalent reactance value. It will CO1-U

   (a) not start (b) start and run (c) start and then stall (d) none of the above

6. The back emf in the stator of a synchronous motor depends on CO1-U

   (a) speed of rotor (b) rotor excitation (c) number of poles (d) flux density

7. Which of the following is not a component of a stepper motor? CO1-U

(a) Windings (b) Rotor and Stator

(c) Commutator (d) Brush

8. What criteria's are necessary to consider when selecting a stepper motor? CO1-U

(a) Mechanical Motion. (b) Inertial Load

(c) Speed Requirements (d) All of the above

9. An intrinsic semiconductor at the absolute zero temperature CO1-U

(a) behaves like a metallic conductor (b) behaves like an insulator

(c) has a large number of holes (d) has a large number of electrons

10. In order to convert an intrinsic semiconductor to an n-type semiconductor, which impurity is preferred? CO1-U

(a) Trivalent (b) Pentavalent (c) Divalent (d) Trivalent

PART – B (5 x 2= 10 Marks)

11. A 200Ω resistor has a 2W power rating. What is the maximum current that can flow in the resistor without exceeding the power rating? CO2-App

12. What is the function of commutator in a DC generator? CO1 U

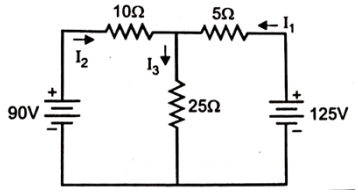
13. Justify. Single phase induction motor has no self-staring. CO1 U

14. Summarize the industrial applications of stepper motor. CO1 U

15. Write the difference between PN junction diode and zener diode. CO1 U

PART – C (5 x 16= 80 Marks)

16. (a) Solve the current supplied by the batteries in the network shown in figure. CO2-App (16)



Or

(b) Develop an expression for RMS value and average value of a sinusoidal waveform. CO2-App (16)

17.	(a)	Explain the principle of operation of a DC Generator and illustrate the characteristics of DC motor.	CO1- U	(16)
		Or		
	(b)	Explain the Principle of Operation of Transformer with neat label	CO1- U	(16)
18.	(a)	Outline the working of split-phase induction motor with neat diagram.	CO1-U	(16)
		Or		
	(b)	Explain the working principle of Shaded pole induction motor.	CO1-U	(16)
19.	(a)	Explain the Construction, Principle of operation and applications of AC servo motor.	CO1- U	(16)
		Or		
	(b)	Explain the Construction, Principle of operation and applications of Linear induction motor.	CO1- U	(16)
20.	(a)	What are energy bands? Distinguish between a conductor, an insulator and a semiconductor on the basis of energy diagram.	CO1- U	(16)
		Or		
	(b)	Illustrate in detail the working of BJT in CB configuration with its input & output characteristics	CO1- U	(16)