Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R1330

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

First Semester

CSE (Cyber Security)

R21UEE130- FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Regulations R2021)

(Common to CSE (IoT) branch)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. The number of cycles per second for an AC quantity is called CO1-U

   (a) RMS value (b) Time Period (c) Frequency (d) Power factor

2. Which of the following is a correct representation of peak value in an AC Circuit? CO1-U

   (a) RMS value/Peak factor (b) RMS value*Form factor

   (c) RMS value/Form factor (d) RMS value*Peak factor

3. Which type of DC motor is suitable for constant-speed applications? CO1-U

   (a) Series motor (b) Shunt motor (c) Compound motor (d) Stepper motor

4. What is the purpose of the core in a transformer? CO1-U

   (a) To provide mechanical strength (b) To increase the resistance

   (c) To decrease the inductance (d) To provide a path for magnetic flux

5. What is the primary function of a Silicon-Controlled Rectifier? CO1-U

   (a) Signal amplification (b) Voltage regulation

   (c) Rectification of AC to DC (d) Temperature sensing

6. Inverters are commonly used for: CO1-U

   (a) Converting DC to AC (b) Regulating voltage

   (c) Storing energy (d) Amplifying signals

7. What is a key step in the instrument calibration process? CO1-U

(a) Increasing instrument weight (b) Adjusting parameters to achieve accurate readings

(c) Decreasing battery life (d) Changing the instrument color

8. What does DSO stand for, and what does its block diagram represent? CO1-U

(a) Digital Sensing Oscillator, circuitry organization

(b) Data Storage Organizer, signal processing

(c) Digital Storage Oscilloscope, signal path and processing

(d) Dynamic Signal Observer, waveform generation

9. Zener diodes are commonly used in electronic circuits for: CO1-U

(a) Amplification (b) Voltage regulation (c) Amplification (d) Voltage regulation

10. In which application is a step-up transformer typically used? CO1-U

(a) Voltage regulation (b) Long-distance power transmission

(c) Short distance power transmission (d) Converting AC to DC

PART – B (5 x 2= 10 Marks)

11. Define charge and its type CO1-U

12. What are the types and applications of DC Motors? CO1-U

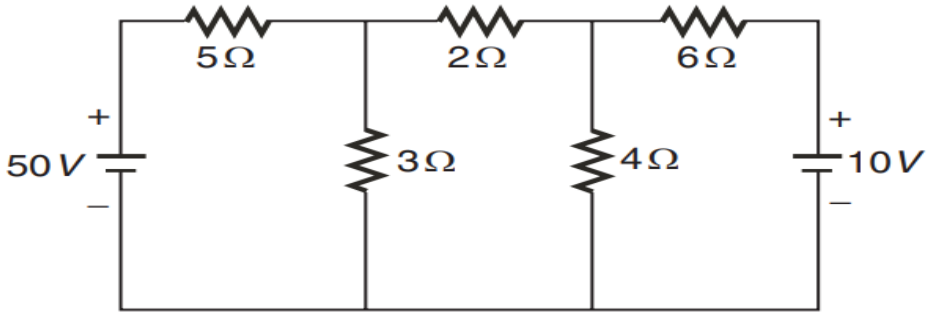
13. How does a transformer work? CO1-U

14. Why is biasing essential in a Bipolar Junction Transistor (BJT)? CO1-U

15. What role does a transducer play in the functional elements of an instrument? CO1 -U

PART – C (5 x 16= 80 Marks)

16. (a) Determine the power dissipation in the 4 Ω resistor of the circuit shown in Fig. CO1-App (16)



Or

	(b)	Derive the RMS value and Average value of sinusoidal waveform and find the form factor and peak factor reactive power and apparent power.	CO1-App	(16)
17.	(a)	Discuss the structural differences between the core and shell in both types of transformers. How do these structural variations affect the overall efficiency and reliability of the transformers?	CO2-U	(16)
		Or		
	(b)	Explore different kinds of DC motors, explain their voltage and current equations, and showcase where each type is commonly used.	CO2-U	(16)
18.	(a)	Explain the operating principle of a PN junction diode. Discuss the formation of the depletion region and how the diode behaves under forward and reverse bias.	CO3-U	(16)
		Or		
	(b)	Explain the working principles of rectifiers. Discuss different types of rectifiers and their applications in converting AC to DC.	CO3-U	(16)
19.	(a)	Why are moving iron meters important? Discuss situations where they are the preferred choice and their key advantages.	CO4-U	(16)
		Or		
	(b)	Identify and explain the basic components of an analog meter. How do these components contribute to the meter's function?	CO4-U	(16)
20.	(a)	Describe the operation of inverters. Discuss the types of inverters and their applications in electronic systems.	CO3-U	(16)
		Or		
	(b)	Explain the working principle of rectifiers. Discuss how they convert alternating current (AC) to direct current (DC) and the different types of rectifiers.	CO3-U	(16)

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