

KADI SARVA VISHWAVIDYALAYA
LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR
B.E. MID-SEMESTER EXAMINATION NOV-2023

Date : 06/11/2023

Subject Name & Code: Basic Electrical & Electronics Engineering (CC-102N)

Time : 09:15 a.m. to 10:45 a.m.

Branch : ALL
Semester : Ist

Max. Marks : 30

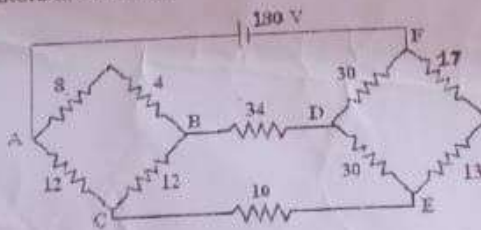
- Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of scientific calculator is permitted.
4) Indicate clearly, the options you attempt along with its respective question number.
5) Use the last page of main supplementary for rough work.

Q.1 All Compulsory.

- (A) Explain KCL & KVL with suitable Circuit Diagram. 5
(B) Define: (i) Magnetic flux density (ii) Phase & phase difference (iii) Magnetic flux (iv) Crest Factor (v) Reluctance 5

Q.2 Answer the following question.

- (A) What is coefficient of coupling? Derive expression for the same between two magnetically coupled coils. 5
(B) Calculate the current flowing through the $10\ \Omega$ resistor of circuit shown below, by using any method. Values of resistors are in ohm. 5



OR

- (A) Derive an expression for impedance, current, and power factor for an R-C series circuit when applied with a.c. voltage. Draw also the phasor diagram. 5
(B) Explain self-induced e.m.f. and mutually induced e.m.f. 5

Q.3 Answer the following question.

- (A) A series R-L circuit with $R = 4\ \Omega$ and $L = 10\text{mH}$ is connected to 230 V, 50 Hz single phase supply. Calculate (i) reactance (ii) impedance, (iii) current drawn by the circuit, (iv) power factor of the circuit and (v) the voltage drop in the resistance and inductor. 5
(B) Derive the voltage and current relationship in 3-phase Star connected load and Draw complete phasor diagram of voltages and currents. 5

OR

- (A) Derive the voltage and current relationship in 3-phase Delta connected load and Draw complete phasor diagram of voltages and currents. 5
(B) Prove that average power consumption in pure inductor is zero. 5

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B.E. SEMESTER I & II EXAMINATION FEBRUARY 2022

Subject Code: - CC102-N Subject Name: - BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Date: - 15/02/2022

Time: - 12:30 pm to 03:30 p.m.

Total Marks: - 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with it's with respective question number.
5. Use the last page of main supplementary of **rough work**.

Section - I

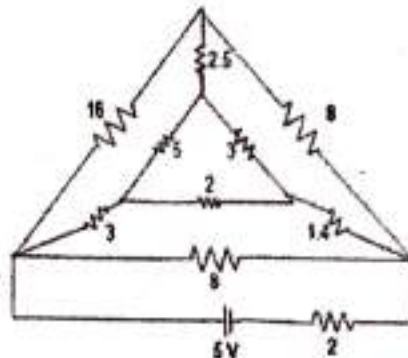
- Q.1 (A) Derive expression for delta to star conversion of resistive network. 5
(B) Explain the ohm's law and also its limitation. 5
(C) Explain Discharging of Capacitor. 5

OR

- Q.1 (C) Explain Dynamically Induced E.M.F.S in brief. 5
Q.2 (A) State and explain Kirchhoff's voltage and current laws. 5
(B) Compare electric circuit and magnetic circuit by their similarities and dissimilarities. 5

OR

- Q.2 (A) Prove for capacitance of a parallel plate capacitor $C = \epsilon_0 \epsilon_r A / d$. 5
(B) Explain Joule's law of electrical heating. 5
Q.3 (A) Find the current supplied by the battery in the network shown in Below: All the resistances are in ohms. 5



- (B) What is coefficient of coupling? Derive expression for the same between two magnetically coupled coils.

OR

- Q.3 (A) Define Following Terms: (I) Electric Flux (II) Electric Field Intensity (III) Magnetic Flux Density (IV) Magnetic Field Intensity (V) Reluctance 5
(B) Explain self-induced e.m.f. and mutually induced e.m.f. 5

Section – II

- Q.4 (A) Advantages of 3-phase ac system over 1-phase ac system. 5
- (B) Define following terms with respect to a.c. waveform (i) Frequency (ii) Power factor (iii) Form Factor (iv) Crest Factor (v) Amplitude 5
- (C) Derive an expression for impedance, current, and power factor for an R-L- series circuit when applied with a.c. voltage. Draw also the phasor diagram. 5
- OR**
- Q.4 (C) Define and derive R.M.S. value of alternating voltage. 5
- Q.5 (A) Explain how ac sinusoidal emf is generated? Derive its equation of $e = E_m \sin \omega t$. 5
- (B) Give the comparison of R-L-C series resonance and R-L-C parallel resonance. 5
- OR**
- Q.5 (A) Derive the voltage and current relationship in delta connected load and Draw complete phasor diagram of voltages and currents. 5
- (B) A resistance of 10Ω , an inductance of $0.2H$ and a capacitance of $100\mu F$ are connected in series across $220V$, $50Hz$ mains. Determine the following (1) Impedance (2) current (3) voltage across R, L and C (4) Power Factor. 5
- Q.6 (A) Explain the two wattmeter method for measurement of 3-phase power. 5
- (B) Prove that average power consumption in pure capacitor is zero. 5
- OR**
- Q.6 (A) Write short note on PN junction Diode. 5
- (B) Explain Full wave bridge Rectifier. 5