Subject Code: 22EC204ES | SET-II | HT NO: | | | 7 | R | | | | | |

# CMR TECHNICAL CAMPUS
## UGC AUTONOMOUS
## B. Tech. II Sem Supply End Examinations, January-2024
## Basic Electrical and Electronics Engineering
## Common to ECE, AIML, CSM, CSC

**Time: 3 Hours** **Max. Marks: 60**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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**PART-A**

**10 X 01 = 10 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1. | a | State Kirchhoff's law. | 1 | CO1 | L1 |
| | b | Obtain expressions for the equivalent star network resistances for a given delta network. | 1 | CO1 | L3 |
| | c | The r.m.s. value of a sine wave is 100 A. Find its peak value. | 1 | CO2 | L3 |
| | d | How much r.m.s. current does a 300 W 200 V bulb take from the 200 V, 50 Hz power line? | 1 | CO2 | L3 |
| | e | State the condition for maximum efficiency in a transformer. | 1 | CO3 | L2 |
| | f | Express the torques equation of D.C. motor. | 1 | CO3 | L2 |
| | g | What is peak inverse voltage? | 1 | CO4 | L2 |
| | h | Sketch the bridge rectifier circuit. | 1 | CO4 | L1 |
| | i | What are the different configurations of BJT? | 1 | CO5 | L2 |
| | j | Show how $\alpha$ and $\beta$ are related to each other. | 1 | CO5 | L3 |

**PART- B**

**5 X 10 = 50 Marks**

| | | Marks | CO | BL |
|---|---|---|---|---|
| 2 | Demonstrate the nodal voltage method for solving networks. How are the nodal equations written? | 10 | CO1 | L4 |
| | OR | | | |
| 3 | A resistance of 10 ohms is connected in series with a combination of two resistances arranged in parallel each of value 20 ohms. Determine the resistance $R_3$ which should be shunted across the parallel combination so that current drawn by the circuit is 1.5 A with applied voltage of 20 V | 10 | CO1 | L3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 4 | A circuit is made of two branches in parallel, one having a resistance of 10 ohms, in series with an inductive reactance of 20 ohms, the other having a resistance of 15 ohms in series with a capacitive reactance of 15 ohms. The supply voltage is 200 V. Find the total current, power and power factor | 10 | CO2 | L3 |
| | OR | | | |
| 5 | Analyse the current relationship and the voltage relationship in a 3-phase star connected system. Also derive the equation for power is such a system. | 10 | CO2 | L4 |
| 6 | Develop the equivalent circuit of a single phase transformer. | 10 | CO3 | L4 |
| | OR | | | |
| 7 | Describe the working of a three phase induction motor. What are its applications? | 10 | CO3 | L2 |
| 8 | Plot the V–I characteristic of zener diode and explain its operation. | 10 | CO4 | L2 |
| | OR | | | |
| 9 | Derive expressions for rectification efficiency, ripple factor, transformer utilisation factor and peak factor of a half wave rectifier with resistive load. | 10 | CO4 | L3 |
| 10 | With the help of V–I characteristics describe the working principle of an SCR. | 10 | CO5 | L2 |
| | OR | | | |
| 11. | Compare and contrast CE, CB and CC configurations of transistors. | 10 | CO5 | L4 |

**CO : Course Outcomes**

**BL : Bloom's Taxonomy Levels** **L 1 : Remembering** **L 2 : Understanding** **L 3 : Applying** **L 4 : Analysing** **L 5 : Evaluating** **L 6 : Creating**

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| Subject Code: 22EC104ES | SET-I | HT NO: | | | 7 | R | | | | | |
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# CMR TECHNICAL CAMPUS

## UGC AUTONOMOUS

**B. Tech. I Semester Supply End Examinations, September-2023**

**Basic Electrical & Electronics Engg**

**Common to CSE, IT & CSD**

**Time: 3 Hours** **Max. Marks: 60**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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**PART-A**

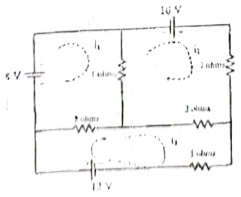
**10 X 01 = 10 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1. | a | Define KCL,KVL? | 1 | CO1 | L2 |
| | b | What are the different types of electrical elements? | 1 | CO1 | L2 |
| | c | Define Form factor and peak factor? | 1 | CO2 | L2 |
| | d | What is real power and reactive power? | 1 | CO2 | L2 |
| | e | What is principle of transformer? | 1 | CO3 | L2 |
| | f | Define Slip? | 1 | CO3 | L2 |
| | g | What is diode current equation? | 1 | CO4 | L2 |
| | h | What are the characteristics of Zener Diode? | 1 | CO4 | L2 |
| | i | What is SCR? | 1 | CO5 | L2 |
| | j | What is transistor? | 1 | CO5 | L2 |

**PART- B**

**5 X 10 = 50 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 2. | a | For the given circuit, determine the current in 5Ω resistor? | 5 | CO1 | L3 |

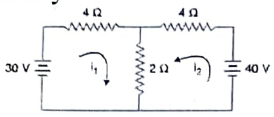


| | | | | | |
|---|---|---|---|---|---|
| | b | Derive the equations for star to delta and delta to star transformation? | 5 | CO1 | L4 |

OR

| | | | | | |
|---|---|---|---|---|---|
| 3 | a | Using node voltage method to find the current in the 10Ω resistance of the following circuit shown in below figure | 5 | CO1 | L3 |

| Subject Code: 22EC104ES | SET-I | HT NO: | | | 7 | R | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|


| | | | | | |
|---|---|---|---|---|---|
| | b | Determine the current in all the branches of the network using loop analysis.   | 5 | CO1 | L3 |
| 4 | | Derive the expression for RMS value, AVG value, Form factor and Peak factor of a sawtooth wave? | 10 | CO2 | L4 |
| | | OR | | | |
| 5 | a | A 100 Ωresistor, 20 μF capacitor and a 2H inductor are connected in series. At what frequency is the phase angle 45°. | 5 | CO2 | L3 |
| | b | A wire carries a current, which is a combination of a d.c current of 10A and a sinusoidal current with a peak value of 10A. Determine RMS value of the resultant. | 5 | CO2 | L3 |
| 6 | | What is principle of DC generator and With a neat diagram Explain the Construction of DC machine? | 10 | CO3 | L2 |
| | | OR | | | |
| 7 | a | What is principle of transformer and derive its emf equation? | 5 | CO3 | L2 |
| | b | Derive the torque equation of DC Motor? | 5 | CO3 | L2 |
| 8 | a | Explain the operation of PN junction diode and draw its V-I characteristics? | 5 | CO4 | L2 |
| | b | With a neat diagram explain the operation of Half wave rectifier? | 5 | CO4 | L2 |
| | | OR | | | |
| 9 | a | Compare the characteristics of centre tapped transformer type and bridge type full wave Rectifiers. | 5 | CO4 | L4 |
| | b | Define the terms dynamic resistance of a diode and Diffusion capacitance of a diode | 5 | CO4 | L2 |
| 10 | a | Explain the construction and operation of SCR | 5 | CO5 | L2 |
| | b | Compare CE, CB and CC characteristics of a BJT | 5 | CO5 | L2 |
| | | OR | | | |
| 11 | a | Explain the construction and operation of CC amplifier? | 5 | CO5 | L2 |
| | b | Explain the construction and operation of CE amplifier? | 5 | CO5 | L2 |

**CO : Course Outcomes**

**BL : Bloom's Taxonomy Levels** **L 1 : Remembering** **L 2 : Understanding**

**L 3 : Applying** **L 4 : Analysing**

**L 5 : Evaluating** **L 6 : Creating**

| Subject Code: 19EE203ES | SET-II | HT NO: | | | 7 | R | | | | | |
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# CMR TECHNICAL CAMPUS

## UGC AUTONOMOUS

**B. Tech. II Sem Supply End Examinations, January-2024**

**Basic Electrical Engineering**

**Department of ECE**

**Time: 3 Hours** **Max. Marks: 70**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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**PART-A**

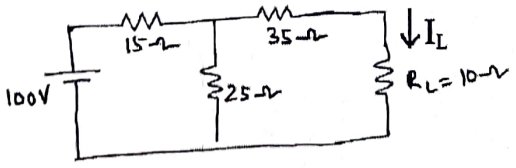
**10 X 02 = 20 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1. | a | Write the volt-ampere relations of R, L, C parameters. | 2 | CO1 | L2 |
| | b | State Thevenin's Theorem? | 2 | CO1 | L1 |
| | c | Define real and Reactive power? | 2 | CO2 | L1 |
| | d | Define form factor? | 2 | CO2 | L1 |
| | e | Draw No load phasor diagram of single-phase transformer. | 2 | CO3 | L2 |
| | f | What is an auto–transformer? | 2 | CO3 | L2 |
| | g | List the basic requirements to produce e.m.f. | 2 | CO4 | L2 |
| | h | What is the necessity of starter for DC motor? | 2 | CO4 | L1 |
| | i | Write the full forms of (i) MCB, (ii) MCCB and (iii) ELCB | 2 | CO5 | L1 |
| | j | What is the purpose of earthing? | 2 | CO5 | L2 |

**PART- B**

**5 X 10 = 50 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 2. | a | State and explain Kirchoff's laws. | 5 | CO1 | L2 |
| | b | Determine the current flowing through the 10Ω resistor using Thevenin's theorem. | 5 | CO1 | L5 |




OR

| | | | | | |
|---|---|---|---|---|---|
| 3 | a | Discuss independent and dependent sources briefly? | 5 | CO1 | L2 |
| | b | Derive the transient DC response of series RL circuit? | 5 | CO1 | L2 |

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| | | | | | |
|---|---|---|---|---|---|
| 4 | a | Describe the generation of sinusoidal signal with neat sketch. | 5 | CO2 | L2 |
| | b | Obtain the phase relation between current & voltage when RC series circuit is connected across sinusoidal voltage. | 5 | CO2 | L2 |
| | | OR | | | |
| 5 | a | Explain the concept of Average value and RMS value. | 5 | CO2 | L2 |
| | b | Derive the relation between line and phase voltages and currents for a balanced STAR connected system. | 5 | CO2 | L2 |
| 6 | a | Explain operation of transformer on No load? | 5 | CO3 | L2 |
| | b | Explain various losses in single phase transformer. | 5 | CO3 | L2 |
| | | OR | | | |
| 7 | a | Develop equivalent circuit of 1-phase transformer? | 5 | CO3 | L2 |
| | b | Draw the connection diagrams of Y-Y, Y-Δ three-phase transformer connections. | 5 | CO3 | L2 |
| 8 | a | Explain in brief the functions of the following parts of a DC Machine (i) Field Poles (ii) Armature (iii) Brushes and (iv) Commutator. | 5 | CO4 | L2 |
| | b | Explain with sketches the constructional features of synchronous generator. | 5 | CO4 | L2 |
| | | OR | | | |
| 9 | a | Explain working principle of 3-phase induction motor. | 5 | CO4 | L2 |
| | b | Describe briefly torque-slip characteristics of induction motor. | 5 | CO4 | L2 |
| 10 | a | Explain construction and operation of MCB? | 5 | CO5 | L2 |
| | b | Discuss the important characteristics of batteries? | 5 | CO5 | L2 |
| | | OR | | | |
| 11 | a | Explain different types of wiring system. | 5 | CO5 | L2 |
| | b | Discuss the power factor improvement methods briefly. | 5 | CO5 | L2 |

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Subject Code: 22EC104ES | SET-II | HT NO: | | | 7 | R | | | | | |

# CMR TECHNICAL CAMPUS

## UGC AUTONOMOUS

## B. Tech. I Semester Regular & Supply End Examinations, January-2024

## Basic Electrical & Electronics Engineering

## (Common to CSE, IT, CSIT &CSD)

**Time: 3 Hours** **Max. Marks: 60**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

****

**PART-A**

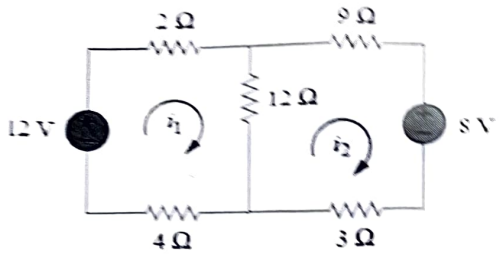
**10 X 01 = 10 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1 | a | Differentiate between ideal and practical energy sources. | 1M | CO1 | L2 |
| | b | Write the types of elements. | 1M | CO1 | L1 |
| | c | Define Apparent power. | 1M | CO2 | L2 |
| | d | What are the three types of power used in AC circuits? | 1M | CO2 | L1 |
| | e | Give some applications of transformer. | 1M | CO3 | L3 |
| | f | List the types of DC generators. | 1M | CO3 | L2 |
| | g | List the applications of the diode. | 1M | CO4 | L2 |
| | h | Define Transformer utilization factor. | 1M | CO4 | L2 |
| | i | Draw the V-I characteristics of SCR. | 1M | CO5 | L3 |
| | j | What is amplifying? | 1M | CO5 | L1 |

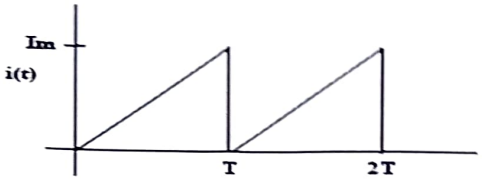
**PART- B**

**5 X 10 = 50 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 2 | a | State Ohms law. Discuss the limitations of ohms law. | 3 | CO1 | L2 |
| | b | Two resistances of 20 ohms and 30 ohms respectively are connected in parallel. These two parallel resistances are further connected in series with a resistance of 15 ohms. If the current through the 15 ohms resistance is 3A. Find<br>(i) the voltage across the whole circuit<br>(ii) the total power consumed | 7 | CO1 | L3 |
| | | OR | | | |
| 3 | a | Deduce the expressions to convert star to delta configuration and vice-versa. | 5 | CO1 | L5 |
| | b | Calculate the mesh currents $i_1$ and $i_2$ in the circuit of Figure. | 5 | CO1 | L3 |




| | | | | | |
|---|---|---|---|---|---|
| 4 | a | Define Average value, RMS value, Form factor & Peak factor. | 3 | CO2 | L2 |
| | b | For the waveform shown in Figure below determine for each (i) the frequency (ii) the average value over half a cycle (iii) the RMS value (iv) the form factor (v) the peak factor. | 7 | CO2 | L3 |




OR

| | | | | | |
|---|---|---|---|---|---|
| 5 | a | Explain the response of series RL circuit for a sinusoidal voltage source. | 5 | CO2 | L1 |
| | b | Discuss the voltage and current relationship in Balanced star connection. | 5 | CO2 | L3 |
| 6 | a | Develop an equation for induced e.m.f in a transformer winding in terms of flux and frequency. | 5 | CO3 | L3 |
| | b | Describe various types of DC generators with their field and armature connections. | 5 | CO3 | L4 |

OR

| | | | | | |
|---|---|---|---|---|---|
| 7 | a | With a neat circuit diagram explain the construction of DC motor. | 5 | CO3 | L3 |
| | b | Explain working principle of three phase induction motor. | 5 | CO3 | L1 |
| 8 | a | Explain the operation of diode and deduce its current equation. | 5 | CO4 | L2 |
| | b | Discuss the operation of full wave rectifier with relevant waveforms. | 5 | CO4 | L1 |

OR

| | | | | | |
|---|---|---|---|---|---|
| 9 | a | Write a short notes on;<br>(i) Transformer Utilisation Factor<br>(ii) Peak Inverse Voltage | 3 | CO4 | L2 |
| | b | Explain the operation of zener diode with required circuit and characteristics. | 7 | CO4 | L1 |
| 10 | a | Describe about Bipolar Junction Transistor? | 5 | CO5 | L1 |
| | b | Explain the working of CB configuration of a BJT and draw its input, output characteristics. | 5 | CO5 | L2 |

OR

| | | | | | |
|---|---|---|---|---|---|
| 11 | a | With neat sketch explain the constructional details of SCR. | 5 | CO5 | L2 |
| | b | Compare the differences between CE, CB and CC configurations. | 5 | CO5 | L4 |

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