Code No: **R201211** **R20** **SET - 1**

I B. Tech II Semester Regular/Supplementary Examinations, July/August - 2023
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to ME, AME, Min E, Pet E, Food E, Pharm E)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT - I

1 a) Discuss the concepts of potential and potential difference by using coulomb's law. [7M]

b) A current of 0.98A is passed through a coil of nichrome wire which has an area of cross section of $0.04cm^2$. If the resistivity of the nichrome is $108*10^{-6}$ ohm-cm and the potential difference across the ends of the coil is 76V. Find the length of the wire? Also find the conductivity and conductance of the wire. [7M]

(OR)

2 a) Derive and explain the properties of a unilateral element. [7M]

b) Describe the current division in a parallel circuit with necessary equations. [7M]

UNIT-II

3 a) Apply the Faraday's law of electromagnetic induction in the operation of a D.C generator. [7M]

b) Obtain the characteristics of DC motor having shunt and series field windings with relevant relations. [7M]

(OR)

4 a) Draw the diagram and explain the process of commutation in the D.C machine. [7M]

b) A 210V D.C series motor takes 34A and runs at 1100 r.p.m. Find the speed at which it will run if its torque is halved. Assume the motor to operate in the un saturated region? The armature resistance is 0.37 ohms and the series field resistance is 0.32 ohms. [7M]

UNIT-III

5 a) Write in detail about the properties and uses of a voltage transformation device. [7M]

b) Describe the constructional advantages of synchronous generators. [7M]

(OR)

6 a) Draw and explain the three flux phasors of a three phase induction motor. [7M]

b) A 65kVA, 1200/410V, 50Hz single phase transformer has 86 turns on the primary. Find the number of turns on the secondary, the full load primary and secondary currents and the maximum value of the flux. [7M]

UNIT-IV

7 a) Justify why the PN junction diode is called as an unidirectional switch with characteristics. [7M]

b) Derive the expression for the peak inverse voltage of a center tapped full bridge diode rectifier. [7M]
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(OR)

8 a) Obtain the half wave rectified output from a diode rectifier circuit using relevant equations. [7M]

b) Memorize the important properties of an operational amplifier. [7M]

UNIT-V

9 a) Explain the section doping of a PNP transistor and its operation. [7M]

b) Draw and explain the input and output characteristics of common base transistor amplifier. [7M]

(OR)

10 a) Derive the output signal wave form of a positive feedback amplifier. [7M]

b) In common base configuration, the value of $\alpha = 0.96A$. A voltage drop of 4.2V is obtained across a resistor of $7k\Omega$ when connected in the collector circuit. Calculate the base current. [7M]

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