Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2019

Course Code: EST 130
Course Name: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
PART I: BASIC ELECTRICAL ENGINEERING
(**2019-Scheme**)

Max. Marks:50 Duration: 90 min

PART A
Answer all questions, each carries 4 marks.

1 Define the terms i) mmf ii) magnetic field strength iii) magnetic flux and iv) magnetic flux density.

2 State and explain i) Faraday's laws and ii) Lenz's law.

3 State and explain Kirchhoff's laws with examples

4 Explain the advantage of three phase system of power supply compared to single phase system of power supply.

5 When an alternating voltage of (80+j60) V is applied to a circuit, the resulting current flow is (-4+j10)A. Find the impedance, power consumed and the phase angle of the circuit. (5x4=20)

PART B
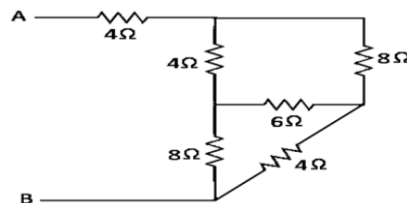*Answer one full question from each module, each question carries 10 marks*

Module-I

6 Calculate the current in each branch of the following circuit using mesh analysis? (10)
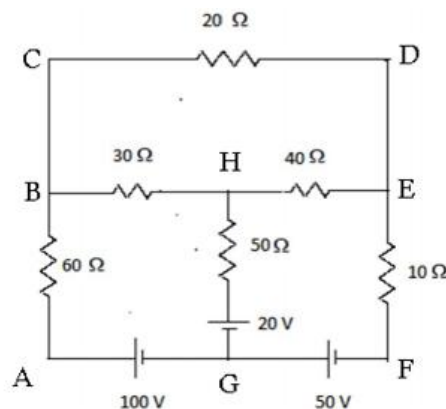
OR

7 Using star-delta transformation, determine the equivalent resistance R_{AB} (10)

Module-II

8   An alternating current varying sinusoidally with a frequency of 50Hz has an rms value of 20A.

i)Write down the equation for the instantaneous current

ii) Find the instantaneous value of current at 0.0025s.

iii)Find the instantaneous value of current 0.125s after passing through a positive maximum value   (10)

iv) At what time, measured from a positive maximum value, will the instantaneous current be 14.14 A?

OR

9   Determine the average and rms values of the triangular voltage wave having maximum value E_m volt as shown in figure.
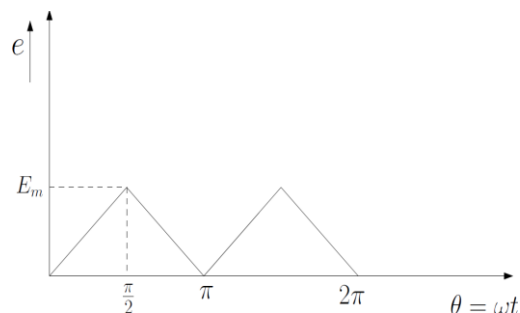
(10)

Module-III

10   Two impedances Z_1 and Z_2 when connected separately across a 220V, 50 Hz supply, consume 300W and 150W at a power factor of 0.4 lagging and 0.7 leading respectively. When the two impedances are connected in series across the same supply, find total power consumed and overall power factor.   (10)

OR

11   A balanced three phase load has per phase impedance of (30+j50) Ω. If the load is connected across 400V, 3 phase supply, find (i) phase current (ii) line current and (iii) power supplied to load when it is connected in (a) star (b) delta.   (10)

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Course Name: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
PART II: BASIC ELECTRONICS ENGINEERING
(**2019-Scheme**)

Max. Marks: 50 Duration: 90 min

PART A
Answer all questions, each carries 4 marks.

1 What are the different types of capacitors? Give any two applications of capacitors.

2 Describe the forward characteristics of a diode?

3 Draw the block diagram of a public address system and write the role of each block.

4 Explain the working of a bridge rectifier.

5 Explain the concept of cells in cellular communication. (5x4=20)

PART B
Answer one full question from each module, each question carries 10 marks

Module-IV

6 a) Explain the formation of potential barrier in a PN junction diode. (4)

   b) What do you understand by Avalanche breakdown? Draw and explain the reverse V-I characteristics of a diode. (6)

OR

7 Explain the working of an NPN transistor. Describe with suitable sketches the input and output characteristics of an NPN transistor. (10)

Module-V

8 a) Draw the circuit diagram of an RC coupled amplifier and explain its frequency response. (6)

   b) Narrate how capacitor filter eliminate ripples from the output of a rectifier. (4)

OR

9 a) What is the need of biasing? Draw the potential divider biasing circuit? (4)

   b) Explain the working of a simple zener voltage regulator. (6)

Module-VI

10 a) What are the merits of AM compared to FM. The carrier amplitude of a given AM wave is 5V and the message signal amplitude is 3V. Find the modulation index. (5)

   b) Explain the block diagram of a super heterodyne receiver. (5)

OR

11 a) Describe the principle of an antenna.   (3)

b) With necessary block diagram explain the working of a GSM system   (7)

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