21N507

Roll No. _____ Total No. of Pages: 3

21N507

B. Tech. II - Sem. (New Scheme) (Main) Exam., (Academic Session 2021- 2022)

All Branch

2FY2 – 07 Basic Electrical Engineering

Common to all Branches

Time: 2 Hours **Maximum Marks: 70**

Instructions to Candidates:

Part – A: *Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer **five** questions out of **ten.***

Part – B: *Analytical/Problem solving questions 3 × 5 marks = 15 marks. Candidates have to answer **three** questions out of **seven.***

Part – C: *Descriptive/Analytical/Problem Solving questions 2 ×20 marks = 40 marks. Candidates have to answer **two** questions out of **five.***

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

Q.1 What are the passive elements in electrical circuits?

Q.2 Write the statement of Kirchhoff's Current Law.

Q.3 Draw leading and lagging of AC with respect to alternating voltage $V=V_{max} \sin \omega t$ by an angle α and β respectively.

Q.4 What is the significance of reactive power?

Q.5 Why are some parts of a dc machine laminated?

Q.6 Draw phasor diagram of ideal transformer at on-load.

Q.7 Draw the V-I characteristics of a p-n junction diode and mention the cut in voltage and peak inverse voltage.

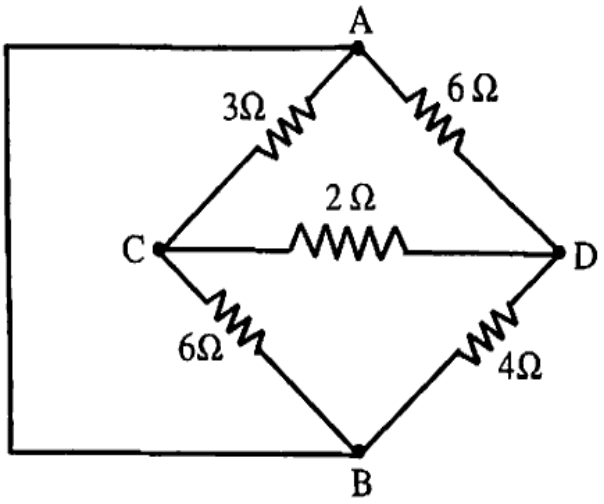
Q.8 In a transistor, explain why base width is small?

Q.9 What is multiplexing in communication system?

Q.10 What do you understand by optical communication?

PART – B

Q.1 Obtain equivalent resistance across AB in given figure by delta – star transformation.



Q.2 For a single phase sinusoidal waveform, determine the average and rms values in terms of maximum value.

Q.3 A voltage V=200 sin 100πt is applied to a coil having R=200Ω and L=0.38H. Find the expression for current and power taken from the supply.

Q.4 Explain the functions of brushes and commutator in a dc machine.

Q.5 A 125 kVA, transformer having voltage of 12500 volt at 50 Hz has primary 400 primary and 50 secondary turns. Assume an ideal transformer, calculate -

(1) The full load primary and secondary currents

(2) Secondary induced emf and

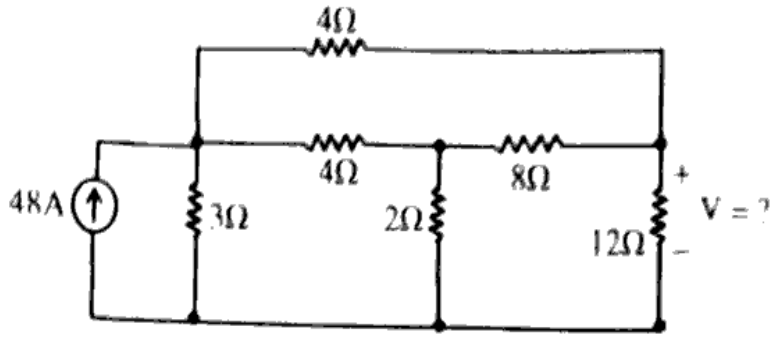
(3) The maximum flux in the core

Q.6 Explain the operation and V-I characteristics of Uni Junction Transistor (UJT)

Q.7 Define AM and FM. Use sketches to explain these definitions.

PART - C

Q.1 Using nodal analysis, find the voltage across 12Ω resistance in the following circuit.



Q.2 If an AC power supply of 100V, 50Hz is connected across a load of impedance, 4+j8 ohms. Calculate the current flowing through the circuit, active power, apparent power, reactive power and power factor.

Q.3 Derive the expression for ripple factor and efficiency of half wave rectifier.

Q.4 (a) What are the main parts of a dc machine? State function of each part of machine.

(b) An 8- pole lap-connected armature has 50 slots with 10 conductors per slot generates a voltage 440V. Determine the speed in rpm at which it is running if the flux per pole is 20 mWb.

Q.5 (a) How does the satellite communication work for the signal transmission?

(b) Explain the working of superheterodyne receiver with the help of block diagram.
