Registration No : | | | | | | | | | | |

Total Number of Pages : 03 **B.Tech**

15BE2102

2nd Semester Back Examination 2018-19

BASIC ELECTRICAL ENGINEERING

BRANCH : AEIE, AERO, CHEM, CIVIL, CSE, ECE, EEE, ELECTRICAL, IEE, IT, MECH, MME, PE, PLASTIC, TEXTILE

Max Marks : 100

Time : 3 Hours

Q.CODE : F711

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) **(2 x 10)**

a) State KCL and KVL.

b) State thevenin's theorem.

c) What do you mean by linear and bilateral network?

d) What is RMS value?

e) Convert $\frac{12+j40}{8+j20}$ to polar form.

f) A coil has an inductance of 25mH and negligible resistance calculates its reactance at 50Hz frequency.

g) Why the efficiency of transformer is high among all electrical machines and devices?

h) Define form factor and peak factor of sine wave.

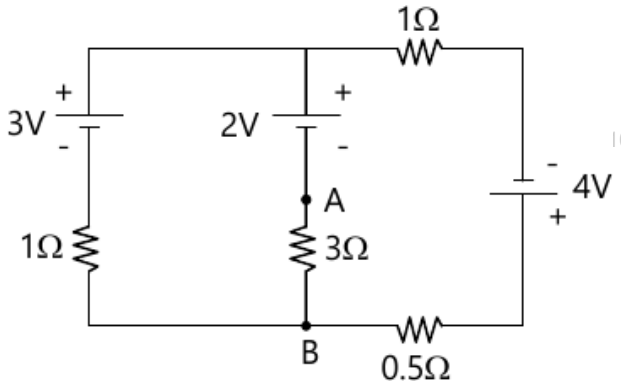
i) Why high permeability magnetic material is chosen for electrical apparatus?

j) What is the function of commutator in DC machine?

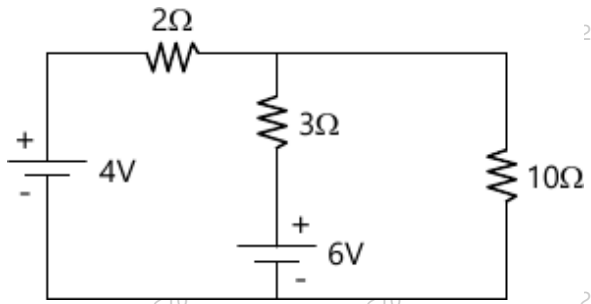
Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) **(6 x 8)**

a) Find the current through 3Ω resistor using mesh analysis.

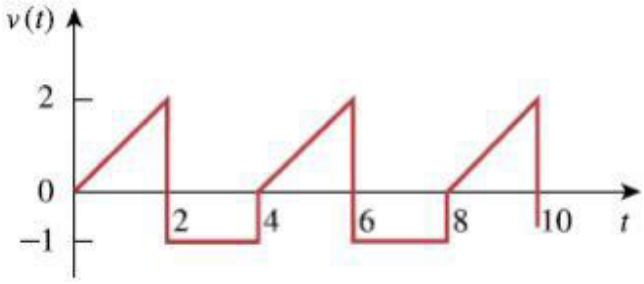


b) Find the current through 10Ω resistor using source transformation .



c) An alternating current is given by i=14.14sin377t .Find (i) RMS value of the current (ii)The instantaneous value of current at t=3mS (ii) Time taken for current to reach 10A

d) Find the RMS value of the following wave form?



e) An iron ring of mean diameter 10 cm is uniformly wound with 2000 turns of wire. When a current of 0.25 A is passed through the coil a flux density of 0.4 T is set up in the iron. Find (i) the magnetizing force and (ii) the relative permeability of the iron under these conditions.

f) A single phase AC current circuit consists of 20Ω resistance, 0.1H inductance coil. A voltage of 240 Volt at 50Hz is applied to the circuit. Calculate (i) The Current in the circuit (ii) Potential difference across Resistor and inductor.

g) Explain B-H curve for magnetic material.

h) A circuit takes a current of 8A, at 100volt, the current lagging by 30^0 behind the applied voltage. Calculate the impedance resistance, reactance and inductance of the circuit if the frequency is 50hz.

i) Explain 3-phase EMF generation.

j) Derive the EMF equation of a single phase transformer.

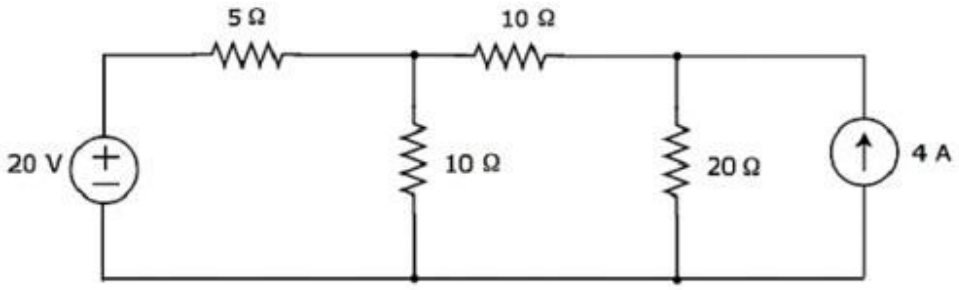
k) The armature of a 6-pole 600 rpm lap wound generator has 90 slots, If each coil has four turns, Calculate flux per pole required to generate an EMF of 288Volts.

l) Explain the principle and construction of DC motor.

Part-III

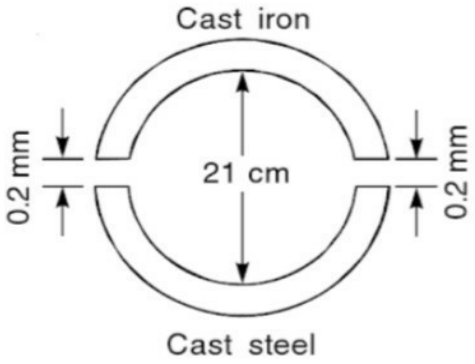
Long Answer Type Questions (Answer Any Two out of Four)

Q3 State and explain super position theorem and find the power absorb by 5Ω resistor? **(16)**



Q4 Explain three-phase emf generation and compare single-phase and three-phase system .Find the phase voltage and total power if a three-phase balanced star connected load is connected to a three-phase 440V balanced supply. The current in each phase is 25A and lags 30^0behind the corresponding phase voltage. **(16)**

Q5 Compare between Magnetic and Electric circuit. Find the ampere-turns required to produce a flux of 8×10^{-4} weber of a ring having diameter 21 cm and cross-sectional area of 10 Cm^2 .The ring is made up semicircular sections of cast iron and cast steel, with each joint having a reluctance equal to an air gap of 0.2 mm. The relative permeabilities of cast steel and cast iron are 800 and 166 respectively. **(16)**



Q6 Explain the construction and principle of operation of a DC generator with neat sketch. **(16)**