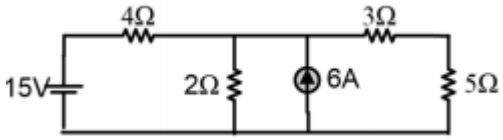
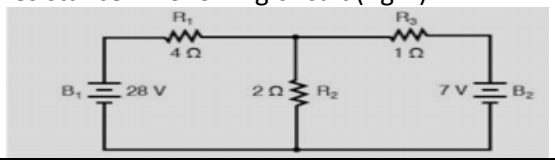
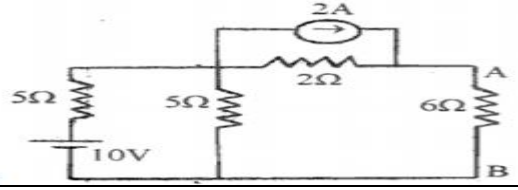
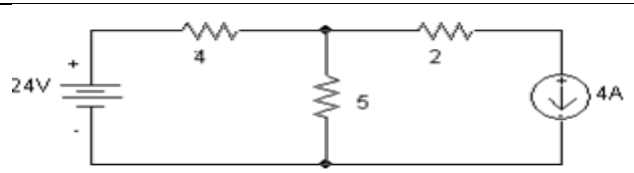
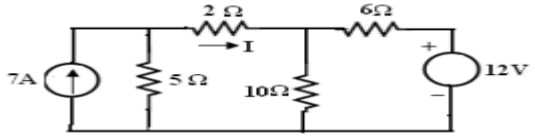
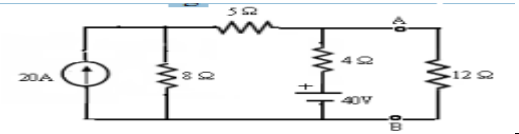
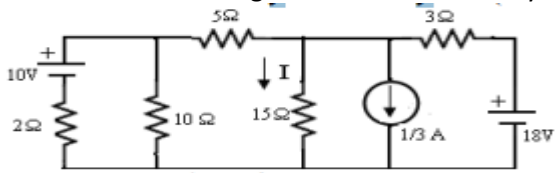
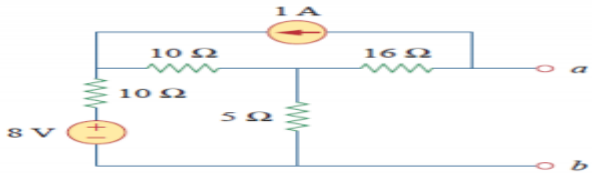
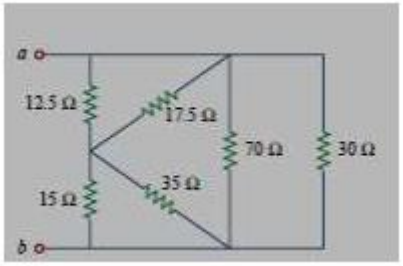
Vision institute of technology, Kanpur

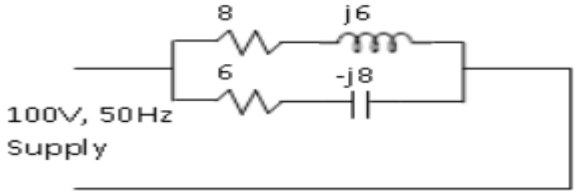
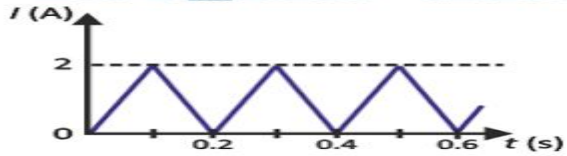
Electrical Engineering (KEE-201)

Assingment-1(Module -1 D.C Networks)

S.No	Question
1	What do you understand by unilateral and bilateral elements? Give examples
2	What is the utility of superposition theorem?
3	Define ideal voltage and current sources
4	Explain (i) Ideal current source (ii) ideal voltage source
5	Define with examples: (i) Active and passive element (ii) bilateral and unilateral elements
6	Explain the duality between a Thevenin's and Norton's equivalent circuits.(2011-12)
7	Explain the Thevenin's theorem and its application.(2009-10)
8	Relate Thevenin's theorem with Norton"
9	Determine the current flowing through 5 ohms resistance in the network shown below (fig-1) using Thevenin's theorem. 
10	Using superposition, find the current flowing through 2 ohm resistance in following circuit (fig-2). 
11	Derive relation for delta to star transformation. Also, Use source transformation method to compute the current through 6 ohm resistor of Fig. 1.  Fig. 1
12	State Norton's theorem. Using Thevenin's theorem find current in 5 ohm resistance of the circuit shown in Fig.2.

	 Fig. 2
13	Find current through 2Ω resistance using superposition theorem in figure 1 
14	Find the current in 12 ohm resistance using Norton's theorem for the given circuit. 
15	Determine current through 15 ohm resistance by node analysis.  Figure 3
16	Obtain the Thevenin's equivalent at terminals of the circuit given b 
17	By using star- delta transformation Determine the effective resistance between terminals ab in the network. 

Vision institute of technology, Kanpur
Electrical Engineering (KEE-201)
Assingment-2(Module -2 A.C Fundamentals)

S.No	Question
1	Determine the form factor of AC current i= 200 Sin (157 t + π/6).
2	Explain the term "Dynamic Impedence" in AC circuits.
3	Define form factor and peak factor
4	A series circuit has R= 10Ω, L= 0.02H and C= 3μF. Calculate Q-factor of the circuit.
5	Two ac currents one represented as i1 = 25 sin (314 t + 20^0) & i2 = 35 sin (314 t + 45^0). Draw the phasor & show the resultant when they are connected in parallel.
6	Derive an expression of resonance frequency in series resonance circuit. If the bandwidth of a resonant circuit is 10 KHz and the lower half power frequency is 120 KHz, find out the value of the upper half power frequency and the quality factor of the circuit.
7	. Derive the relationship between line and phase current & voltage for a star connected 3-phase balanced system. A balanced delta connected load of (12 + j 9) Ω/ phase is connected to 3- phase 400 V supply. Calculate line current, power factor and power drawn by it
8	The instantaneous values of two alternating voltages are represented by V1 = 60 Sin θ and V2 = Sin (θ- π/3). Derive expressions for the instantaneous values of (i) the sum and (ii) the difference of these voltages.
9	What is resonance? Derive the quality factor of the series RLC circuit at resonance.
10	Explain Two-wattmeter method to determine power in 3-phase system.
11	Define power factor. What are the causes and disadvantages of low power factor? Explain the method of power factor improvement.
12	Refer to the circuit shown in Fig.3. Find (a) rms line current (b) power dissipated in each branch (c) power factor (d) reactive power in each branch (e) total apparent power.  **Fig. 3**
13	What is the necessity and advantage of 3-phase system? Derive VL=√3Vph for star connected System.
14	Derive the expression for resonant frequency & quality factor for an ac circuit under the condition of parallel resonance.
15	Derive the relation between line current & phase current in case of three phase delta connected balanced load. Three identical coils of resistance 8Ω and inductive reactance 6Ω are connected in delta across 400V mains. Determine power, power factor and line current. Draw phasor diagram
16	What is meant by power factor? What is its signification? How will you obtain power factor from kVA triangle? (2009-10)
17	Enlist the advantages of three phase system over Single phase.
18	A 3 phase ,3 wire star connected system has 150 volt b/w 2 phases each phase as z=5 ∠-30 find a) Impedance of each phase b) Total power c) Drawn the phasor diagram
19	A balance star connected load from symmetrical 3 phase 400 V, 50 Hz supply system. The current in each phases 30 amp. With lagging pf at 30 degree find a) Impedance of each phase .b) Total power c) Drawn the phasor diagram
20	A 3 phase balance connected across a 3 phase , 400 v ac supply draws a line current of 10amp. 2 watt meters are used to measure input power. The ratio of two watt meter reading is 2:1 find the reading of two watt meter.
21	A balance 3-ϕ star connected load of 18kW taking a leading current of 60A, when connected across a3 phase 440 volts,50 Hz supply. Find the value the nature of load.
22	In a two watt meter method power measured was 30 kw at 0.7 pf lagging find the reading of each watt meter.
23	Find the Average value and RMS value of the following wave. 
24	A circuit consists of three parallel branches. The branch currents are represented by i1 = 10 Sin wt, i2 = 20 Sin (wt + 400), i3 = 7.5 Sin (wt – 450). Find the resultant current and express it in the form i=im Sin (wt+ϕ).

Vision institute of technology, Kanpur

Electrical Engineering (KEE-201)

Assingment-3(Module -3 Transformer)

S.No	Question
1	What will happen if the primary of a transformer is connected to dc supply
2	What are the advantages of auto-transformer over two winding transformer
3	Draw and explain the no load and full load phasor diagrams for a single phase transformer.
4	(i) Explain single phase Auto transformer and give its application. (ii) In a 25 KVA, 2000/200 V transformer, the constant and variable losses are 350 W and 400 W respectively. Calculate the efficiency on unity power factor at (i) full load and (ii) half load.
5	Explain different types of Magnetic materials with examples.
6	List the various losses occurring in transformer and write the condition of maximum efficiency. In a 25 kVA, 2000/200V the iron and copper losses are 200W and 400 W respectively. Calculate the efficiency at half load and 0.8 pf lagging. Determine also the maximum efficiency and the corresponding load.
7	Describe the analogies between electric and magnetic circuit
8	Draw and explain the equivalent circuit of transformer. A 100kVA, 2,400/240V, 50Hz, single phase transformer has the following parameters-Primary winding (hv side): resistance r1 = 2.4Ω, leakage resistance X1 = 6.0Ω. Secondary winding (lv side): resistance r2 = 0.03Ω, leakage resistance X2 = 0.07Ω. Find the equivalent resistance & leakage reactance referred to secondary.
9	Discuss the principle of operation of a single phase transformer. Derive EMF equation for a single phase transformer
10	What is voltage Regulation in a single Phase Transformer? What should be its value for an ideal transformer?
11	The maximum efficiency of a 100 KVA, 1100/440 V, 50 Hz transformer is 96%, This occurs at 75% of full load at 0.8 p.f. lagging. Find the efficiency of transformer at 3.4 FL at 0.6 p.f. leading
12	Draw and explain hysteresis loop. What is meant by saturation, coercive force and residual magnetism? What is its significance? (2009-10,11-12)
13	Explain the efficiency of a transformer and condition for maximum efficiency. Also explain kVA supplied at max efficiency. 2003-04,10-11,
14	Explain O.C and S.C test on transformer. Why these tests are to be performed? 2008-09
15	(i) Explain single phase Auto transformer and give its application. (ii) In a 25 KVA, 2000/200 V transformer, the constant and variable losses are 350 W and 400 W respectively. Calculate the efficiency on unity power factor at (i) full load and (ii) half load
16	Derive the max efficiency condition a single phase transformer. A single phase 100 KVA. 1100/230V, 50 Hz transformer has 95 % efficiency at .8 lagging power factors both at full load and also at half load. Determine iron and copper loss at full load for transformer. Classify the different types of transformer also Derive the EMF equation of a single phase transformer.

Vision institute of technology, Kanpur

Electrical Engineering (KEE-201)

Assingment-4(Module -4 Electric Machines)

S.No	Question
1	What happen when vanished back emf of DC motor?
	Why commutator is needed?
	Why dc series motor is never started on No load?
	Write different methods of starting single phase induction motor.
2	Deduce the emf and torque equation for d.c motor.
3	Sketch and explain the speed-load characteristics of following dc motor: i) series motor ii) shunt motor iii) both type of compound motor
4	Describe the difference between the separately excited shunt generator and the self excited one. Explain the process of voltage built up in a self excited shunt generation.
5	Discuss the constructional features and explain various parts of D.C generator.
6	Explain the working principle of three phase induction motor and draw its slip –torque characteristics.
7	Define 'slip' . Explain the working principle of single phase induction motor.
8	A 3-phase , 4-pole induction motor is supplied from 3-phase ,50Hz ac supply .Calculate (i) the synchronous speed (ii) the rotor speed when slip is 4%.(iii) The rotor frequency when rotor runs at 600rpm.
9	Discuss the principle of operation of three phase synchronous machine. Give various application of it. (2009-10 , 2008-09,2010-11)
10	Give the expression of speed in terms of poles and frequency of supply
11	Explain the starting methods of single phase induction motor.
12	A 4 pole dc generator with wave connected armature has 41slots, and 12conductor/slot. Armature resistance R a =0.5Ω. Shunt resistance is R sh =200Ω. Flux per pole is 125mWb.Speed N=1000rpm.Calculate voltage across 10Ω load resistance across the armature terminal.
13	
14	A 20kW, 200V shunt generator has an armature resistance of 0.05Ω and a shunt field resistance of 200Ω.Calculate the power developed in the armature when it delivers rated output.
15	A dc shunt machine connected to 230V supply has resistance of armature as 0.115Ω and field winding as 115Ω. Find the ratio of the speed as a generator to the speed as a motor with the line current in each case being 100A.
16	Draw the slip-torque characteristics of three phase induction motor. A 3-phase, 50 Hz induction motor has 6 poles and operates with a slip of 5 % at a certain load. Determine (i) the speed of the rotor with respect to the stator (ii) the frequency of rotor current (iii) the speed of the rotor magnetic field with respect to rotor.
17	(i) Describe any one method of starting single phase induction motor with neat diagram. (ii) Why Synchronous motor is not self starting?
18	An 6 pole lap connected armature has 860 conductors a flux 0.05 Wb per pole and speed of 360 rpm find generated e.m.f
19	Explain working principle of 3 phase induction motor. A 3 phase 4 pole induction motor is connected to 3 phase 50Hz ac supply find (i) Synchronous speed (ii) The rotor speed when slip is 4% (iii) Rotor frequency when rotor speed is 600 rpm
20	What is the relation between frequencies of stator & rotor currents? A 3-phase, 50Hz induction motor has 6 poles and operates with a slip of 5% at a certain load. Determine (i) The speed of rotor with respect to the stator. (ii) The frequency of the rotor current. (iii) The speed of the rotor magnetic field with respect to the stator
21	Derive the EMF equation of D.C. Generator. An 8 pole lap wound dc generator has 450 armature turns. It operates at 0.02 wb flux per pole and runs at 1000 rpm at no load. Find the emf induced by it.

Vision institute of technology, Kanpur

Electrical Engineering (KEE-201)

Assingment-5(Module -5)

S.No	Question
1	Write full form of (i) MCB (ii) MCCB (iii) ELCB (iv) SFU.
2	Explain following: (i) Need of Earthing (ii)Battery backup
3	Write short notes on the following: (i) MCB (ii) MCCB (c) Fuse (d) Types of wires
4	Explain the requirement of earthing for electrical equipment. What is the difference between neutral and earthing
5	Name the various cables used in electrical system based on insulation. Explain any two. What are the features of good conductor in electrical circuit
6	An alkaline cell is discharged at a steady current of 4 A for 12 hours, the average terminal voltage being 1.2 V. To restore it to original state of voltage, a steady current of 3 A for 20 hours is required, the average terminal voltage being 1.44 V. Calculate the ampere-hour and watt-hour efficiencies in this particular case
7	Define Pipe eathing.
8	Define plate eathing.
9	What are the factors that affect the battery capacity?