

Agnihotri Engineering & GATE Classes

Scripting success stories

Basic Electrical & Electronics Engineering (BE-1114)

Unit I

Electrical circuit analysis- Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's & superposition theorem, star-delta transformation.

1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

Unit II

Transformers-Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, iron losses and copper losses, equivalent circuit, phasor diagram.

Unit III

Rotating Electric machines- Constructional details of DC machine, induction machine and synchronous machine, Working principle of DC machines, classification of DC machine, EMF equation, armature reaction, characteristic of separately excited and self excited generator. Working principle of DC motor, Importance of back EMF, Starting of DC motor, speed torque characteristic of separately excited and self excited DC motor.

Unit IV

Measuring Instruments : Construction and operation of moving coil, moving iron ammeter and voltmeter, hotwire instruments, theory and operation of D'Arsonval, Ballistic and vibration galvanometer, instrument transformers, extension of instrument ranges, AC and DC current probes.

Unit V

Electronics: Binary Number system binary addition, subtraction, multiplication and division, subtraction operation using 1's and 2's complement forms, Octal number system, hexadecimal number system conversion of number system from one number system to another number system, types of Resistor, Inductor and capacitor, color coding of resistor and capacitor P-type and N-type semiconductor, semiconductor diode its operation in forward and reverse bias, V-I characteristics, half wave and full wave rectification, application.

GATE oriented approach to **BEEE** from very beginning

Classes on (ED,BEEE,M1,M2,M3,NA,CONTROL,DSP & other GATE oriented Engineering Subjects)

By :- Agnihotri sir (7415712500) BTI Road , Sherpura , Vidisha

Download GATE syllabus & Ebooks at AEGC site www.aegc.yolasite.com & follow us at www.facebook.com/aegcsumit

Agnihotri Engineering & GATE Classes

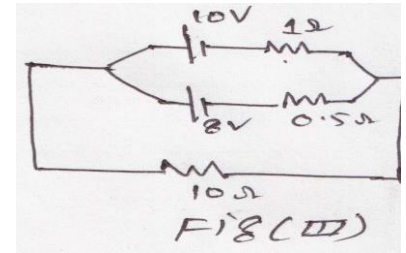
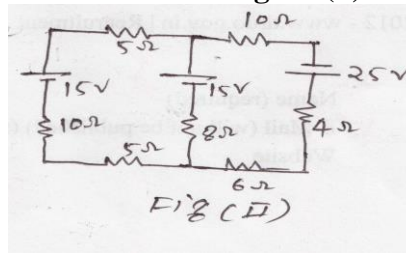
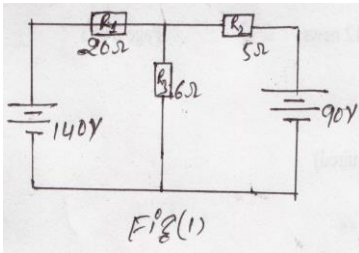
Scripting success stories

DC & AC CIRCUIT ANALYSIS

Q.1) Use kirchoff's law to solve following

a) Calculate the current & power in $6\ \Omega$ resistor for given circuit in figure(i) ?

b) Find the current in each branch for circuit shown in figure (ii)



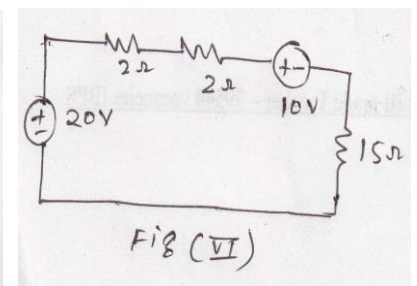
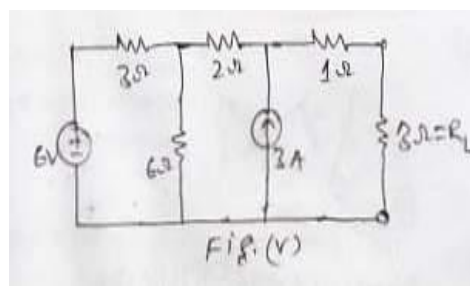
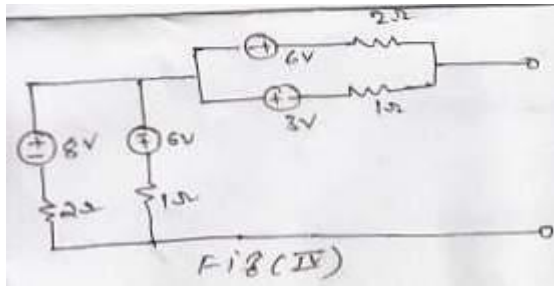
Q.2) Two batteries of voltage 10v & 8v having internal resistance of $1\ \Omega$ & $0.5\ \Omega$ respectively are connected in parallel with resistance of $10\ \Omega$ as shown in figure (III). Find the current flowing through batteries & external resistance?

Q.3) Use source transformation to solve the following?

a) Convert the circuit shown in figure (IV) into single current source?

b) Use source transformation to find load current in the circuit shown in figure (V)

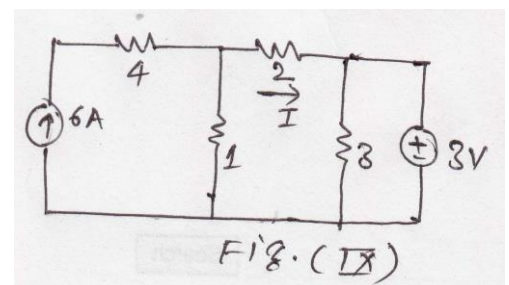
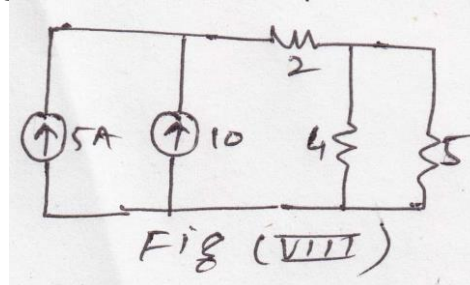
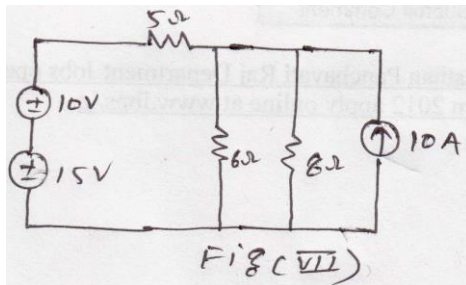
c) Find the current through $15\ \Omega$ resistor using source conversion technique?



d) Draw the circuit shown in figure (VII) after converting voltage source into current source & then find the current & voltage drop across each element ?

e) Find the current & power loss in $5\ \Omega$ resistor for the circuit shown in figure (VIII).

f) Find the current I in the circuit given in figure (IX)

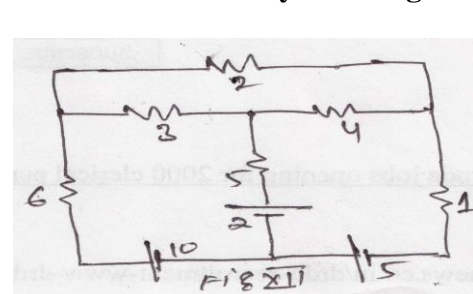
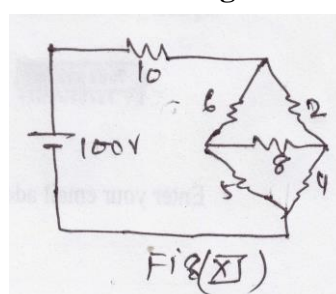
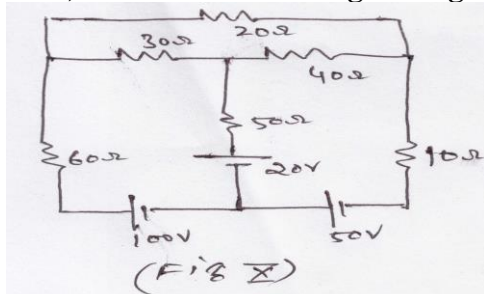


Q.4) Use mesh or loop analysis to solve following circuits

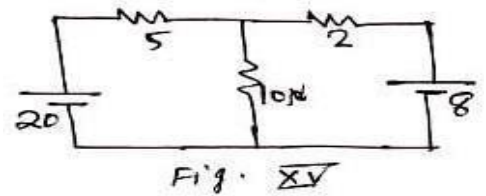
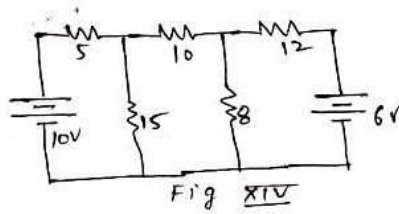
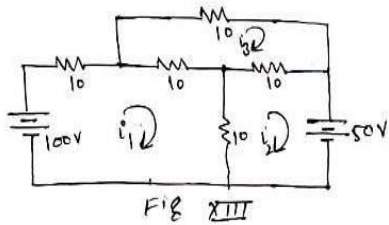
a) find the current in each branch of network shown in figure (X).

b) Determine Current supplied by the source in network of figure (XI) using mesh analysis?

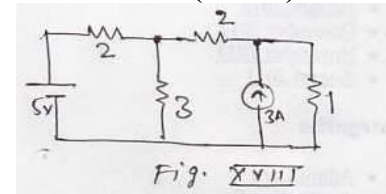
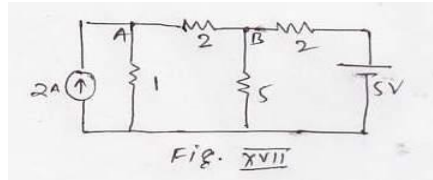
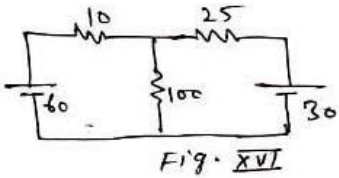
c) Find current flowing through each branch using matrix method of mesh analysis for figure (XII).



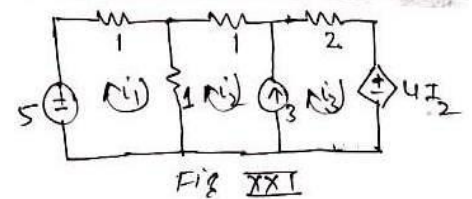
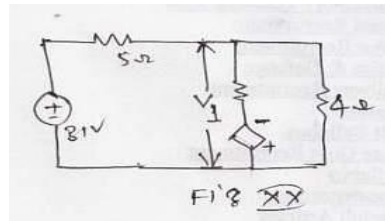
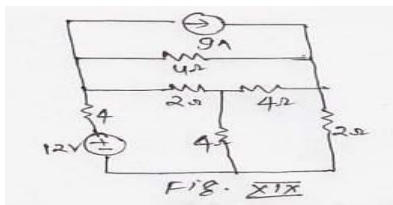
- Q.5) a) Solve for loop current indicated in figure (XIII) ?
 b) Find current in each branch of network shown in figure (XIV) ?



- Q.6) Use node analysis to solve the following ?
 a) Find the current flowing across $10\ \Omega$ resistor for circuit (XV)?
 b) Find the current through $25\ \Omega$ resistor for circuit (XVI)?
 c) Use node analysis for circuit shown in figure (XVII) to find current through branch AB ?
 d) Using node analysis to determine the current through $3\ \Omega$ resistor for circuit (XVIII)?



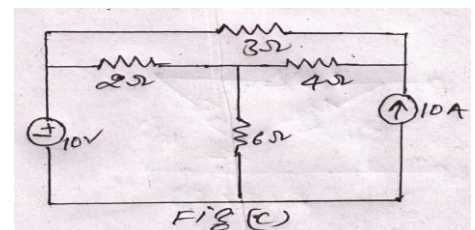
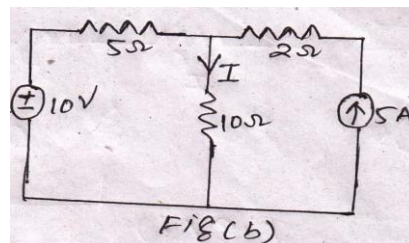
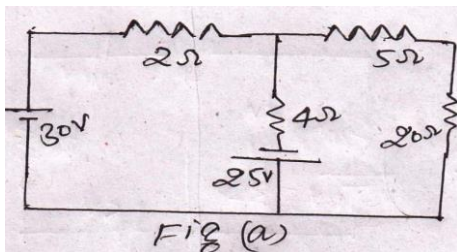
- Q.7) Use node analysis to determine the current supplied by 12 v source as shown in fig. (XIX)?



- Q.8) For circuit shown in (XX) , apply Mesh analysis determine the current supplied by 31v source & current across $4\ \Omega$ resistor?

- Q.9) Find the mesh current as indicated for circuit shown in figure (XXI)

- Q.10) Solve current in each branch of circuit by applying superposition theorem in figure (a)?



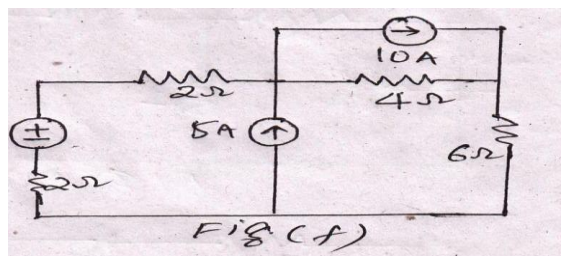
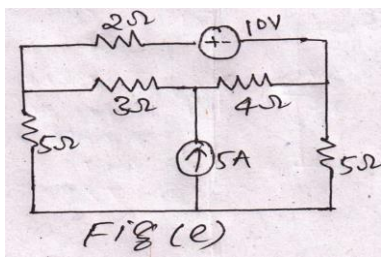
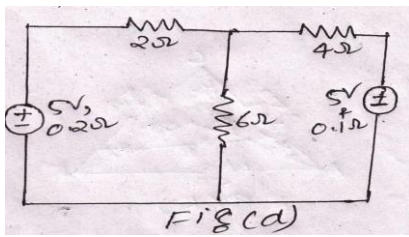
- Q.11) Calculate the indicated current I in ckt shown in figure (b)

- Q.12) Find current across $6\ \Omega$ resistor by applying superposition theorem as in figure (c)?

- Q.13) Find power loss in $4\ \Omega$ resistor by applying superposition theorem from fig(d)?

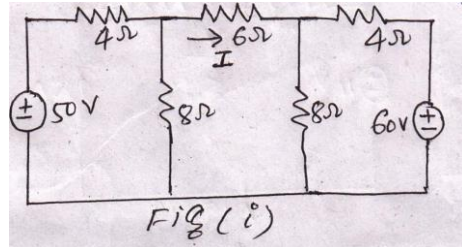
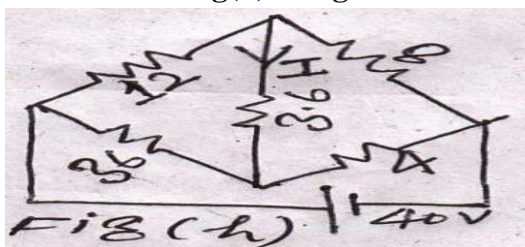
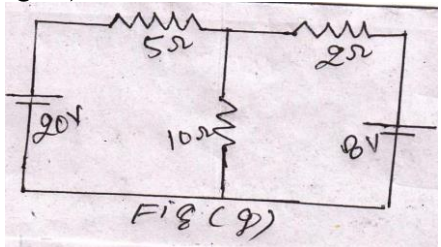
- Q.14) Find the voltage across $4\ \Omega$ resistor by applying superposition theorem in fig.(e)?

- Q.15) Find the current across $6\ \Omega$ resistor by applying superposition theorem in fig.(f)?



Q.16) Apply Thevenin theorem in ckt of figure (g) to calculate current across 10Ω resistor ?

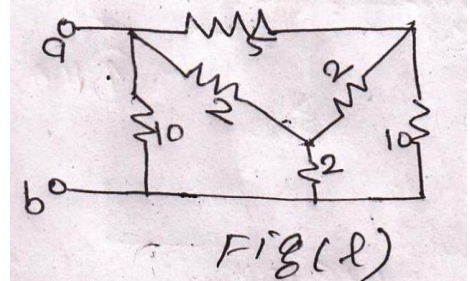
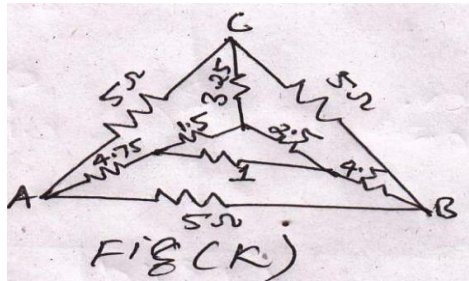
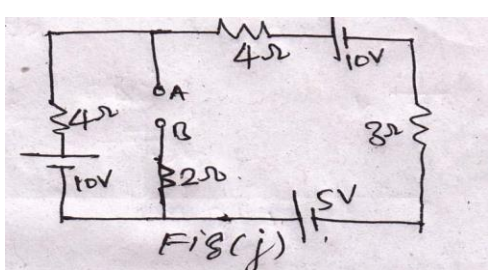
Q.17) Calculate current I as indicated in ckt of fig(h) using Thevenin theorem?



Q.18) Find the current I as shown in ckt of figure(i) using Thevenin theorem?

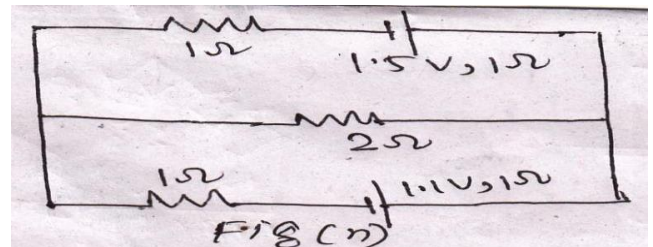
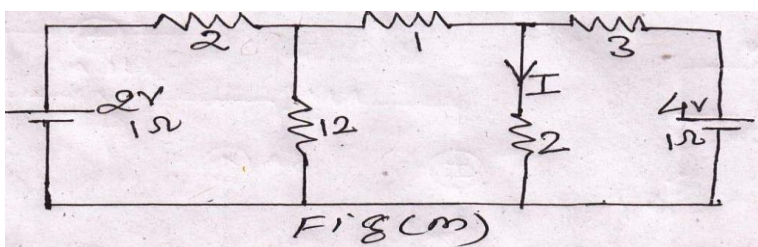
Q.19) Find the power across 8Ω resistor connected across AB as shown in figure (j)

Q.20) Using star delta transformation find equivalent resistance across AB in fig(k) & fig(l)



Q.21) Solve circuit of figure(m) to find current I using
 i) Maxwell loop analysis b) Node Analysis c) Superposition theorem & d) Thevenin theorem

Q.22) Solve circuit of figure(n) to find current across 2Ω resistor using
 i) Superposition theorem & ii) Maxwell loop analysis?



Q.23) A choke coil has the resistance of 10Ω , inductance of 0.05 Henry is connected in series with a 100 micro farad capacitor, the whole ckt has been connected to 200 v, 50HZ supply calculate
 i) Impedance ii) Current iii) Power Factor iv) Power Input v) Apparent power vi) Reactive Power

Q.24) Two wattmeter has been used to measure the power input of 150 kilowatt, 440 volt, 3 phase induction motor running at full load. The wattmeter readings are 115 kilowatt & 50 kilowatt. Calculate
 i) The input to the motor ii) Power factor of the motor iii) Line current Drawn by the Motor
 iv) Efficiency of the motor