AR16

CODE: 16ME1001   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
ENGINEERING DRAWING
(Common to CE, ME, CSE & IT)

Time: 3 Hours   Max Marks: 70M

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1. An area of 144 sqcm on a map represents an area of 9 sqkm **14M** on the field. Find the R.F.of the scale for this map and draw a diagonal scale to show kilometers, hectometres and decameters and to measure up to 5 kilometres. Indicate on the scale a distance 3 kilometres, 5 hectometres and 6 decametres.

(OR)

2. Inscribe an ellipse in a Rhombus of side 90mm. The shorter **14M** diagonal of the Rhombus is 80mm.

UNIT-II

3. Draw the projections of points whose positions are given **14M** below
   i. Point A is in HP and 20mm in front of VP
   ii. Point B is 40mm below HP and 22mm behind VP
   iii. Point C is 28mm above HP and 35mm in front of VP
   iv. Point D is 14mm above HP and in VP

(OR)

4. a Two Pegs fixed on a wall are 6m apart. The distance between **10M** the Pegs measured parallel to the floor is 4m. If one Peg is 1.5m above the floor, find the height of the second Peg and inclination of the line joining the two Pegs with the floor.

   b Draw the projections of a 80mm long straight line when the **4M** line is Perpendicular to HP, 30mm in front of VP and its one end is 10mm above HP.

5. Draw the projections of a regular pentagonal plane of 40mm **14M** side having its surface inclined at 30 degrees to the H.P. and a side parallel to the H.P. and inclined at 60 degrees to the V.P

(OR)

6. The top view of a plate the surface of which is perpendicular **14M** to the V.P. and inclined at 60 degrees to the H.P.is a circle of 50 mm diameter. Draw its three views

UNIT-IV

7. A cube of side length 60mm is resting on one of its faces on **14 M** HP with a vertical face inclined at 40 degrees to VP.

(OR)

8. A cone resting on one of its generators on HP with axis **14M** parallel to VP. Cone base diameter 60mm and axis length 80mm. Draw its projections.

UNIT-V

9. Draw the projections of a cone with bottom base 40 mm **14M** diameter, axis height 50 mm is placed at the centre of the top base of a cylinder of base diameter 40 mm and axis 50 mm long, so that the axes of both the solids are coinciding and is vertical.

(OR)

10. Draw the Front , Top and Side views for the following **14M** Figure
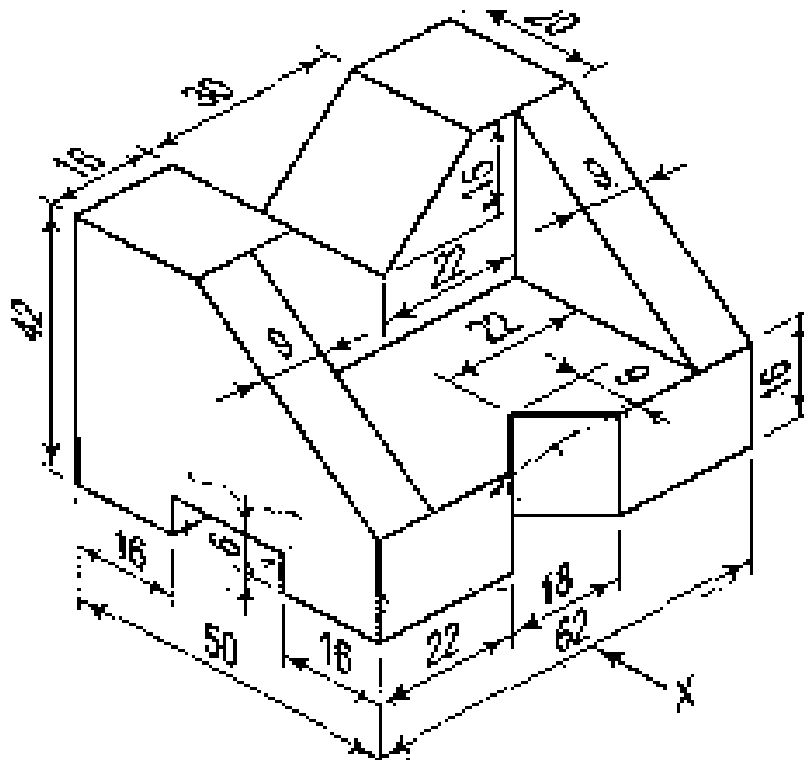
AR16

CODE: 16EE1001   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
BASIC ELECTRIC CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

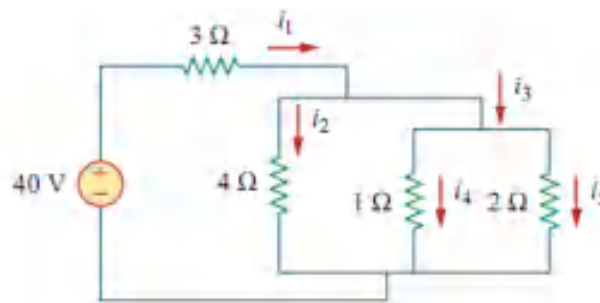Time: 3 Hours   Max Marks: 70M

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT –I
1. a) Briefly explain voltage and current sources   [6M]
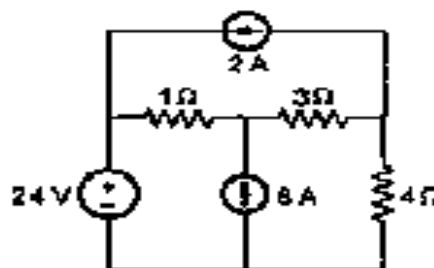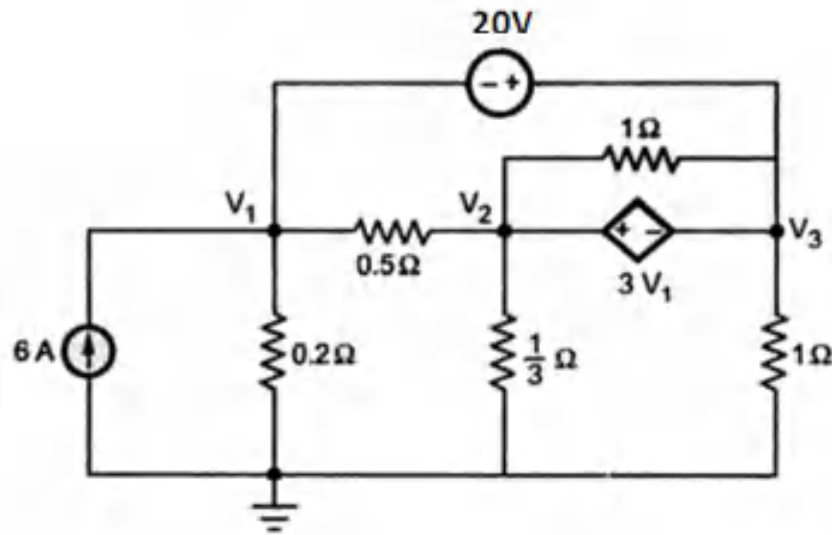   b) Determine i1 to i5 currents for the given circuit   [8M]

(or)

2.a) Explain the source transformation used in electrical network
                                                              [8M]
   b)   State and explain kirchoff's laws   [6M]

UNIT –II
3.a) Find the power delivered to the 4Ω resistor using mesh analysis
                                                              [7M]

b) Determine the voltages V1,V2 and V3 using node analysis   [7M]

(OR)

4.a) Write short note on Faradays laws of electromagnetic induction

[4M]

b) Derive the expression for coefficient of coupling of two magnetically coupled coils   [10M]

UNIT-III

5.a) Explain the following terms   [8M]

i) Root Mean Square value   ii) Average value

iii) Form Factor   iv) Peak factor

b) Applied voltage and resulting current in a circuit are given by $\bar{V} = 150\angle30^0V$ and $\bar{I} = 2\angle-15^0$.If the circuit works on a 50Hz supply. Determine the power factor, real power, reactive power, apparent power, impedance, resistance and reactance of the circuit   [6M]
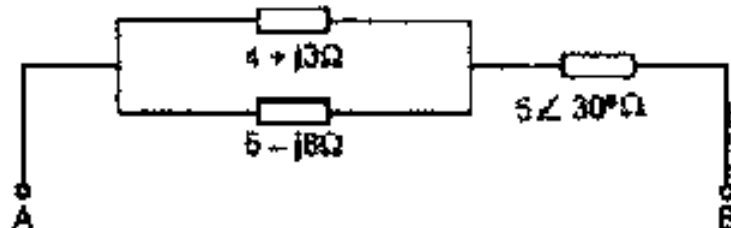
(OR)

6.a) Find V1 ,V2 using nodal analysis   **[7M]**

$$10\underline{/45^\circ}\text{ V}$$

V_1 1 $4\,\Omega$ 2 V_2

$3\underline{/0^\circ}$ A $-j3\,\Omega$ $j6\,\Omega$ $12\,\Omega$
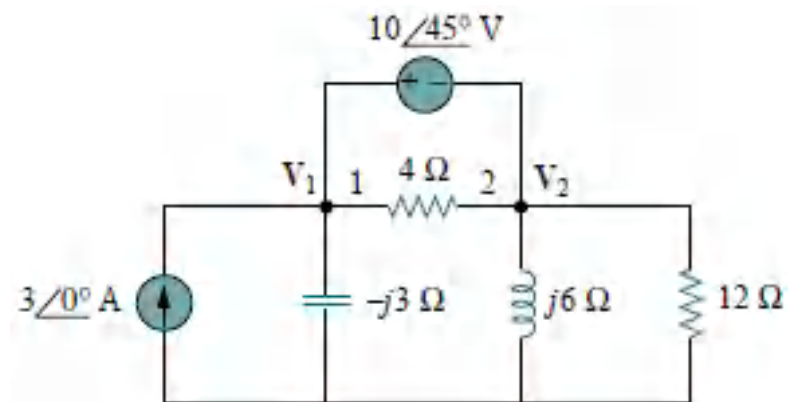
b) Calculate the equivalent impedance of the network as viewed through the terminals A-B .If an alternating voltage of $150\angle 0^\circ$ V is connected across A-B ,Calculate the current drawn from the source

[7M]

$4 + j3\,\Omega$

$5 - j8\,\Omega$

$5\angle 30^\circ\,\Omega$

A

B

UNIT-IV

7.a) A RLC series circuit of 8Ω resistance should be designed to have bandwidth of 50 Hz .Determine the values of L and C ,So that the circuit resonant at 250 Hz   **[7M]**

b) Explain the locus diagram for the current in a RC series ciucuit with
i) R variable ii) Xc variable   **[7M]**

(OR)

8.a) Derive the expression for bandwidth ,lower and upper half power frequencies of a series R-L-C Circuit [8M]

 b) A circuit consists of a choke coil with resistance of 2Ω and reactance of 1Ω at 50 Hz .It is connected in series with other coil with negligible resistance and variable inductive reactance .Draw the locus diagram of the current drawn from a 150 V ,50 Hz supply .If the variable inductive reactance is allowed to vary from 0 to 3Ω ,calculate maximum and minimum values of current [6M]

UNIT-V

9.a) Derive the relation between line and phase quantities for a balanced 3-phase star connected System [7M]

b) Three identical impedances are connected in delta to a three phase supply of 400V. The line current is 34.65A, and the total power taken from the supply is 14.4kW . Calculate the resistance and reactance values of each impedance [7M]

(OR)

10. a) Three identical resistances are connected in star against a balanced three phase voltage supply. If one of the resistor is removed, how much power will be reduce? [8M]

b) Explain the solution of three phase unbalanced circuits [6M]

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UNIT-I

1. a) Find the total equivalent capacitance, total energy stored if the applied voltage is 100V for the circuit given
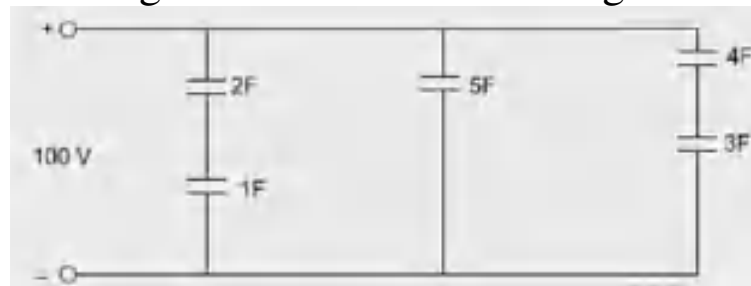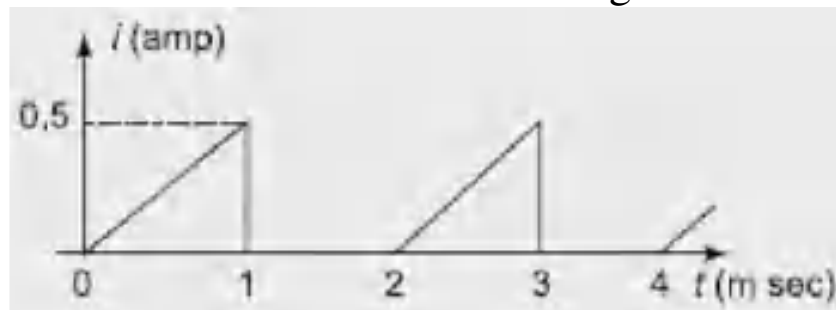

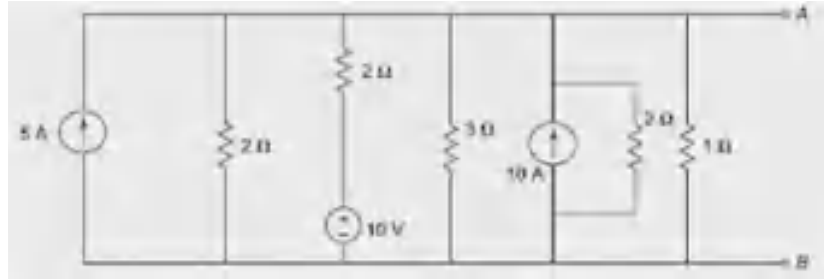b) Using source transformation, find the power delivered by the 50V voltage source in the circuit.
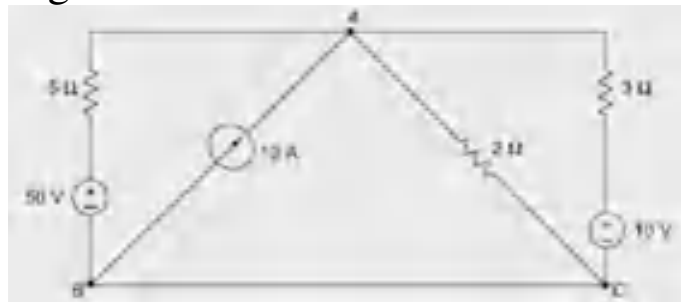
(OR)

2. a) The current waveform shown in figure is the current in a pure inductor L = 0.5H. Sketch the voltage waveform.

b) By using source transformation, source combination and resistance combination convert the circuit into a single voltage source and single resistance.
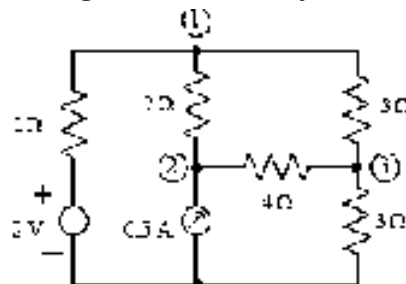

UNIT-II

3. a) Find the Average and RMS value for a voltage defined as the following saw-tooth function over an interval [0, 2T]:
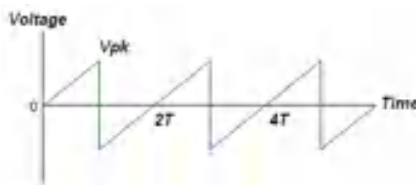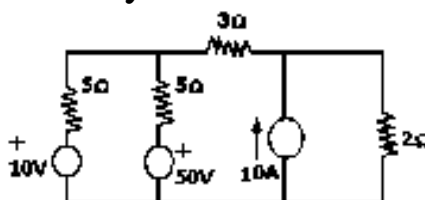

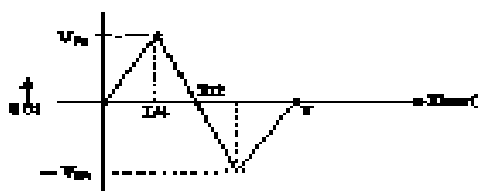b) For the following circuit find the power dissipated in 4 ohms resistor using nodal analysis.

(OR)

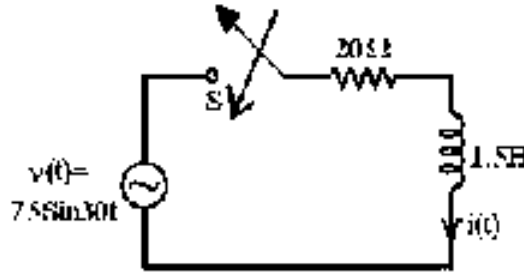4. a) Determine the Current through 3 ohms resistor using Nodal method of Analysis?

b) Find the RMS and Average values of the wave form if $V_m = 100$Volts

2 of 4

5. a) A sinusoidal voltage of 75Sin30t is applied to a series circuit of R = 20Ω and L = 1.5H at t=0 . Determine the current i(t) for all t≥0. Assume zero initial conditions.

   b) A 70Ω resistor, a 5mH coil and a 15pF capacitor are in series across a 110Vsupply.Determine the resonant frequency the Q of the circuit at this frequency, the voltage across the capacitor at resonance.

(OR)

6. a) Derive expression for transient response of RC series circuit excited by a sinusoidal source.
   b) A coil of 20Ω resistance and 0.2H inductance is connected in parallel with a capacitor of 100μF.Find the frequency of resonance and the effective impedance at resonance.

UNIT-IV

7. a) State and prove Norton's Theorem.
   b) By using Norton's Theorem, find the current in the load resistor R_L for the circuit shown below.
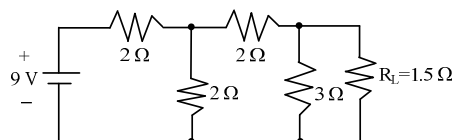
(OR)

8. a) State and Explain with proof of Reciprocity Theorem.
   b) A periodic voltage waveform has been shown. Determine rms value, average value, form factor.

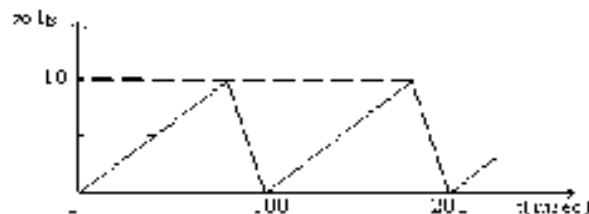9. a) A two port network has the following parameters
   $Z_{11} = 20\ \Omega$, $Z_{12} = 5\ \Omega$, $Z_{21} = 20$ and $Z_{22} = 15\ \Omega$. And
   Calculate the short circuit parameters.

   b) In the circuit shown, the switch is closed on the
   position 1 at t = 0 there by applied a D.C voltage
   of 100V to series R-L circuit. At t = 500μsec, the
   switch is moved to position 2 obtain the
   expression for current i(t) in the both intervals
   sketch i(t).
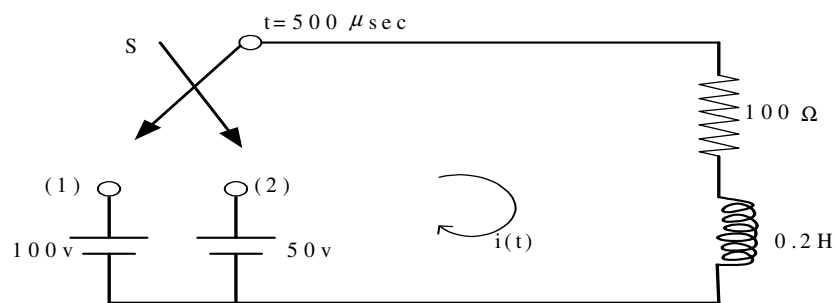
(OR)

10. a) Determine z and y parameters of the 2-port network shown
   in the fig.
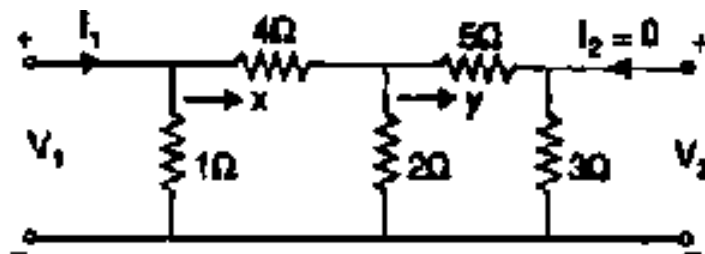
   b) In the circuit shown, the switch S has been in the closed
   position for a long time and opens at t=0. Compute $i_L(t)$ for
   t >0, $V_R(0^-)$ and $V_R(0^+)$

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AR13

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) A seven sided polygon is known as _____
    b) What is the full form of R.F. in scales?
    c) If both front and top views of a point lie above xy, then the point is _____ quadrant.
    d) If top view of a line is a point, then its front view is _____ to xy.
    e) A circular plane is inclined to VP and perpendicular to HP then its front view is _____.
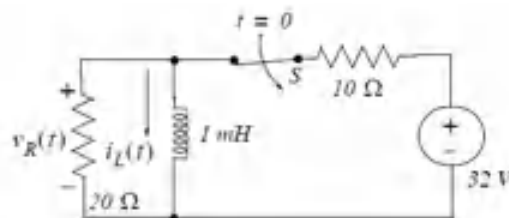   f) A rectangle plane appears as a square in top view then that rectangle is inclined to _____ plane.
    g) Name the different regular polyhedrons?
    h) What is the solid obtained by revolving a triangle about its fixed side?
    i) What is the difference between isometric view and isometric projection?
    j) What is the angle between two isometric lines?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. Construct a vernier scale 1: 40 to read metres, decimetre and centimetres and long enough to measure up to 6 m. Mark a distance of 5.76 m on it.   **12M**

(OR)

3. Draw a parabola when the distance between the focus and directrix is 50 mm. Also draw a tangent and a normal at a point 70 mm from the directrix.   **12M**

UNIT-II

4. Draw the projections of the following points on a common reference line keeping distance between their projectors 25 mm apart.   **12M**
    a) Point A is 40 mm above the H.P. and 25 mm in front of the V.P.
    b) Point B is 25 mm above the H.P. and in the V.P.
    c) Point C is in the H.P. and 30 mm in front of the V.P.
    d) Point D is 40 mm above the H.P. and 20 mm behind the V.P.
    e) Point E is in the H.P. and 20 mm behind the V.P.
    f) Point F is 30 mm below the H.P. and 25 mm behind the V.P.

(OR)

5. a) Draw the projections of a 60 mm long line PQ which is situated both on the H.P. and the V.P.   **4M**
    b) A 80 mm long line PQ has end P 20 mm above H.P. and 40 mm in front of the V.P. The line is inclined at 30^0 to the H.P. and is parallel to the V.P. Draw the projections of the line .   **8M**

AR13

UNIT-III

6. a) A rectangular plane of sides 60 mm and 30 mm has a shorter side on the H.P. The **8M** surface of the plane is inclined at 60^0 to the H.P. and perpendicular to V.P. Draw its projections.

    b) A square plane of side 30 mm. Its surface is perpendicular to both H.P. and V.P. **4M** Draw its projections.

(OR)

7. A semi circular plane of diameter 70 mm has its straight edge on the V.P, and **12M** inclined at 30^0 to the H.P. Draw the projection of plane when its surface is inclined at 45^0 to the V.P.

UNIT-IV

8. A hexagonal prism of base edge 30 mm and axis 60 mm has an edge of its base in **12M** the V.P. such that the axis is inclined at 30^0 to the V.P. and parallel to the H.P. Draw its projections.

(OR)

9. A hexagonal pyramid of base side 25 mm and axis 60 mm has an edge of base **12M** 45^0parallel to H.P. Its axis is parallel to V.P. and inclined at 45^0 to the H.P. Draw its projections when the apex lies in the H.P.

UNIT-V

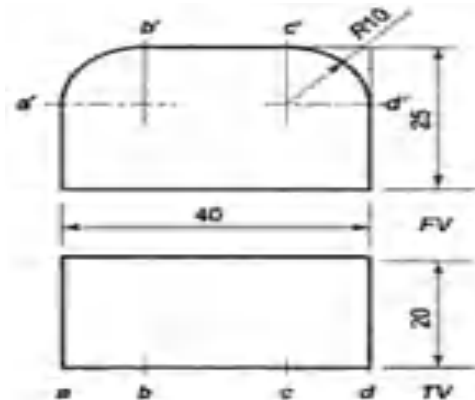10. The front and the top views of an object are shown in Fig.1. Draw its isometric **12M** view.

Fig.1.

(OR)

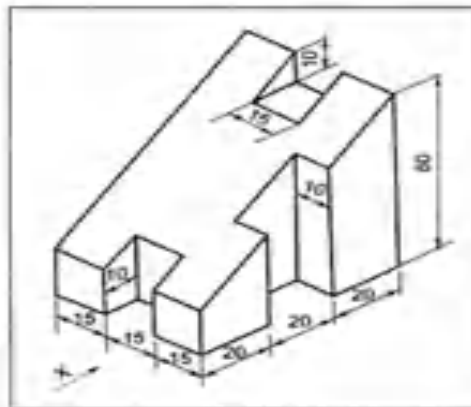11. **Draw three views of object shown in Fig.2.**   **12M**

Fig.2.

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AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017

FUNDAMENTALS OF ELECTRICAL ENGINEERING
(Electrical and Electronics Engineering)

Time: 3 hours   **Max Marks: 70**

PART-A

Answer all questions   **[10 x 1=10M]**

1. a) What is meant by an ideal source?
    b) Explain the source transformation technique.
    c) Define peak factor of a periodic function.
    d) Explain the term complex power.
    e) Define the terms reluctance and permeability in magnetic circuits.
    f) Define coefficient of coupling.
    g) Explain PMMC instrument in brief.
    h) Mention various torques that are produced in an indicating instrument.
    i) What is a ceiling rose? Where do you use it?
    j) Define the term admittance of an electrical network.

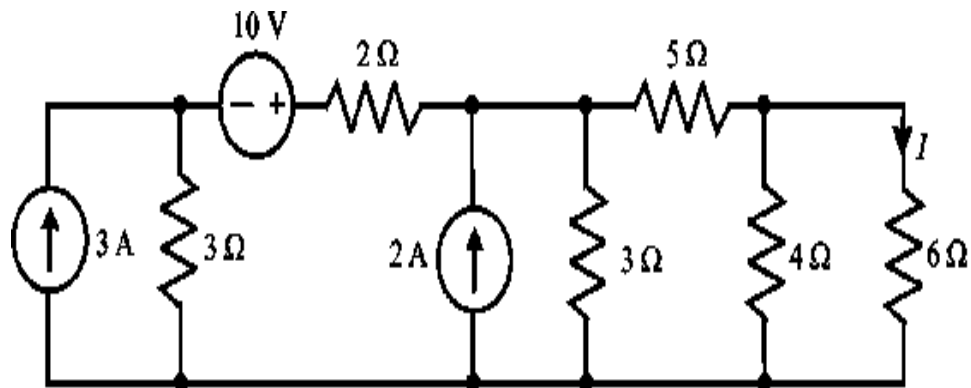## PART-B

Answer one question from each unit.   **[5 x 12=60 M]**

UNIT-I

2. a) Explain the V-I relationship and characteristics of the following elements: (i) R (ii) L (iii) C [6 M]

   b) Find the current 'I' in the circuit given below using source transformation.   [6 M]

(OR)

3. a) Using Kirchhoff's laws, obtain the current through and voltage across the 10 Ohm resistor in the following circuit. [6 M]
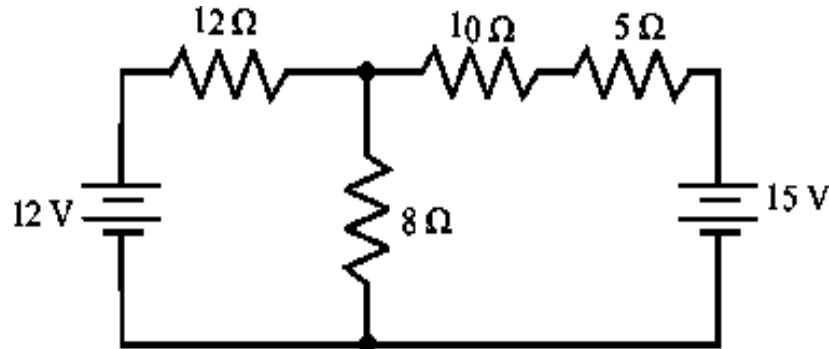
b) Explain, how a practical source is different from an ideal source. Draw their characteristics. [6 M]

UNIT-II

4. a) Obtain the form factor of the current waveform given below. [6 M]
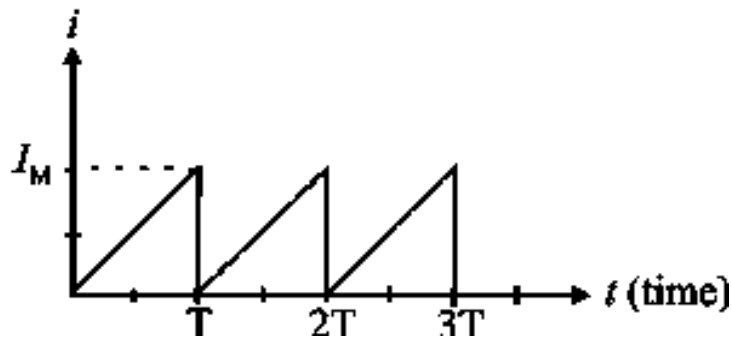
b) A coil having R=5 ohms, L= 0.1 H is in parallel with a C = 50 μF. Find the equivalent admittance when connected across a 230 V, 50 Hz supply. Also calculate the power factor of the circuit. [6 M]

(OR)

5. a) Calculate the active and reactive powers supplied by the source in the fig. given below. [6 M]
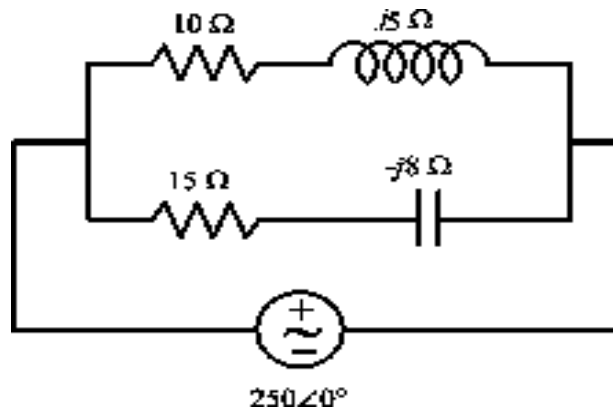
b) Derive the steady-state response of a RL series circuit due to a sinusoidal forcing function. [6 M]

UNIT-III

6. a) Deference between electrical and magnetic circuits   [6 M]

   b) Two coupled coils with $L_1 = 0.02$ H, $L_2 = 0.01$ H and k = 0.5 are connected in four different ways, series aiding, series opposing and parallel with both arrangements of the winding sense. What are the four equivalent inductances?   [6 M]

(OR)

7. Two coupled coils with respective self inductances $L_1 = 0.8$ H and $L_2 = 0.2$ H have a coupling coefficient of 0.6 coil 1 has 500 turns. It the current in coil 1 is i1 (t) = 10 Sin 200 t, determine the voltage at coil to and the maximum flux set up by the coil 1.   [12 M]

UNIT-IV

8. With a neat construction diagram, explain the operation of a PMMC instrument.   [12M]

(OR)

9. With a neat construction diagram, explain the operation of a PMMI instrument.   [12M]

UNIT-V

10. a) What are the various safety accessories in electrical wiring?   [6 M]
    b) What are the basic rules in electrical wiring system?   [6 M]

(OR)

11. How do you select the interior wiring system for a given building?   [12 M]

13EC1001   **AR13/SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
ELECTRONIC DEVICES
(Electronics and Communication Engineering)

Time: 3 hours   Max Marks: 70

PART- A

Answer all questions   [10 x 1=10M]

1. a) Define Extrinsic semiconductor.

    b) Define Step Graded Junction PN diode.

    c) What are the applications of zener diode?

    d) What is meant by cut-in voltage of a diode?.

    e) What is thermal run away effect?

    f) What are the applications of transistor?

    g) Give relationship between α and β in a transistor.

    h) Define Diffusion Capacitance of a diode?

    i) Define pinch-off region in the case of JFET.

    j) What are the advantages of full wave rectifier over half wave rectifier?

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-1

2. Derive and explain the electrostatic deflection sensitivity in CRT and magnetic deflection
    sensitivity in CRT   [12M]

(OR)

3. Explain the force on charged particle in electric and magnetic fields in detail   [12M]

UNIT-II

4. a) Explain mobility,conductivity and law of junction.
    b) Explain Hall effect and derive an expression for Hall coefficient and also mention its
        applications.

[6M+6M]

(OR)

5. a) Explain "Fermi Dirac" probability density function and derive the expression for concentration of holes and electrons in valence band and conduction bands.
   b) Explain conductors, insulators and semiconductors using energyband diagram.

                                                                              [6M+6M]

UNIT-III

6. a) Explain P-N junction diode in forward biasing and reverse biasing conditions with circuits and also explain its V-I characteristis.
   b) Distinguish between Avalanche and Zener breakdown diodes.   [6M+6M]

(OR)

7. a) Explain full wave rectifier with circuit diagram and waveforms.
   b) Explain working principle of tunnel diode with the help of energy band diagrams.

                                                                              [6M+6M]

UNIT-IV

8. a) Draw the circuit diagram of BJT in CE configuration and explain with the help of input and output characteristics
   b) Explain how transistor acts as an amplifier   [6M+6M]

(OR)

9. a) Explain about input and output characteristics of a transistor in CB configuration with relevant sketches?
   b) Draw and explain transistor current component.   [6M+6M]

UNIT-V

10. a) Draw the structure of JFET and explain its principle of operation and also explain its Drain and transfer characteristics.
    b) Write down the differences between BJT & JFET.   [8M+4M]

(OR)
11. a) Draw and explain UJT and its V-I characterstics.
    b) Draw and explain the structure of Enhancement mode MOSFET and also its V-I Characteristics.   [6M+6M]

2-2

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