

ENGINEERING DRAWING**(Common to CE, ME, CSE & IT)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a Divide a line of 150 mm length into 8 equal parts 3M
- b Construct a regular pentagon of given side of 30 mm by using angle method. 3M
- c A rectangular plot of 100 square kilometres is represented on a certain map by a similar rectangular area of 4 square centimetres. Draw a scale to show kilometres and mark a distance of 43 kilometres on it. 8M

(OR)

2. A circle of 40 mm diameter, rolls along a line for one revolution clock-wise. Draw the locus of a point on the circle, which is in contact with the line. Also, draw a tangent and a normal to the curve, at a point 35 mm from the directing line. 14M

UNIT-II

3. a (i) Draw the projections of a point A lying on HP and 50 mm in front of VP. 8M
- (ii) Draw the projections of a point A lying on VP and 55 mm above HP.
- (iii) A point D is 35 mm below HP and 35 mm behind VP, draw the projections.
- (iv) A point S is 35 mm above HP and 55 mm behind VP, draw the projections.
- b The top view of a 75 mm long line measures 55 mm. The line is in the V.P., its one end being 25 mm above H.P. Draw its projections. 6M

(OR)

4. a A line AB 50 long, is parallel to both HP and VP. The line is 40 above HP and 30 in front of VP. Draw the projections of the line. 4M
- b A point A is on HP and in front of VP. Another point B is on VP and below HP. The line joining their front views makes an angle of 45° with xy, while the line joining their top views makes an angle of 30° . Find the distance of the point B from HP. 10M

UNIT-III

5. A rectangular plane of 60 mmx40 mm is resting on shorter edge on the ground and inclined at 45° to VP. The plane surface is inclined at 30° to HP. Draw its projections. 14M

(OR)

6. Draw the projections of regular hexagon of 25 mm side having one of its edge in HP and inclined at 60° to VP and its surface making an angle of 60° to HP. 14M

UNIT-IV

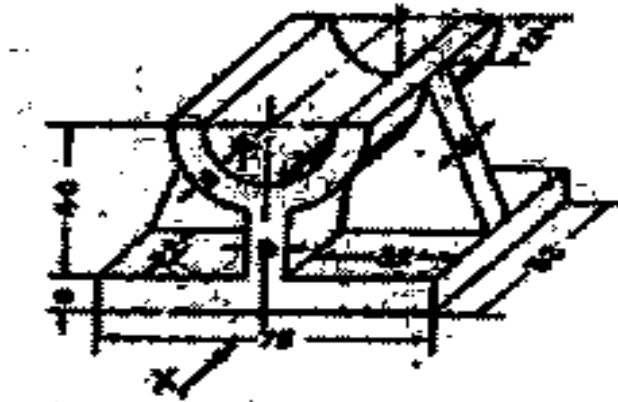
7. Draw the projection of cylinder 60 mm diameter and 90 mm long. Axis inclined at 45° to HP and parallel to VP. 14M

(OR)

8. An equilateral triangular prism of side of base 25 mm and axis 50 mm long, is resting on an edge of its base on HP. The face containing that edge is inclined at 30° to HP. Draw the projections of the prism. 14M

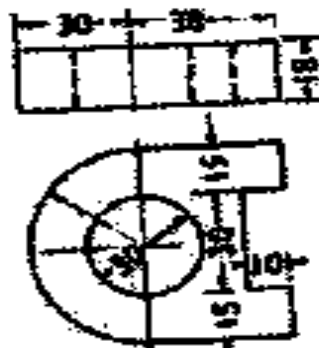
UNIT-V

9. Draw the front view, top view and right side view of the object shown below. 14M



(OR)

10. Two views of a casting are shown below. Draw the isometric view of the casting. (dimensions are in mm) 14M



BASIC ELECTRIC CIRCUIT ANALYSIS**(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 70M**

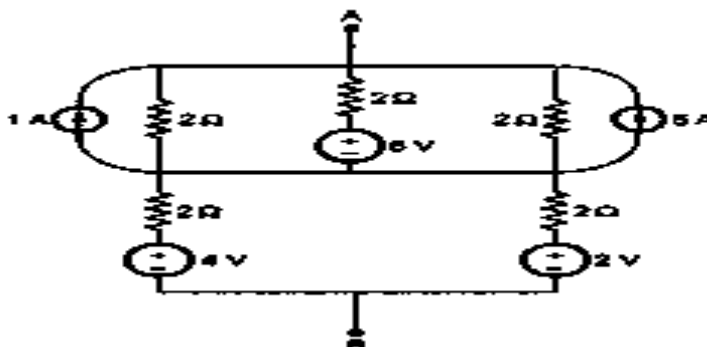
Answer ONE Question from each Unit

All Questions Carry Equal Marks

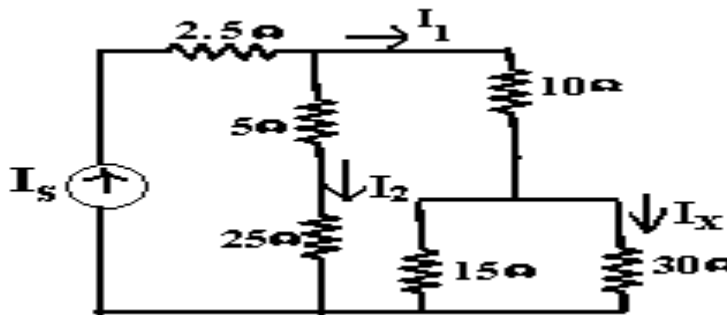
All parts of the question must be answered in one place only

UNIT -I

- 1.a) Explain the Voltage-Current characteristics of ideal, practical voltage source and current source [4M]
- b) Reduce the network into an equivalent network across terminals A and B with one equivalent voltage source [10M]

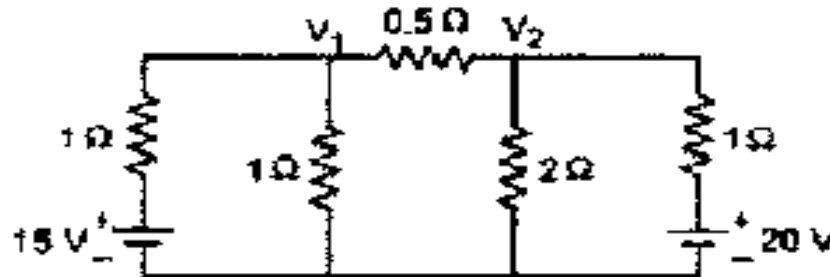
**(OR)**

- 2.a) State and explain kirchoff's laws [6M]
- b) With reference to the circuit shown in figure below, find
- (i) I_x if $I_1=12\text{mA}$; (ii) I_1 if $I_x=12\text{mA}$;
- (iii) I_x if $I_2=15\text{mA}$;(iv) I_x if $I_s=60\text{mA}$ [8M]



UNIT-II

- 3.a) State and explain Faradays laws of electromagnetic induction [4M]
b) Calculate V_1 and V_2 using Nodal analysis [10M]

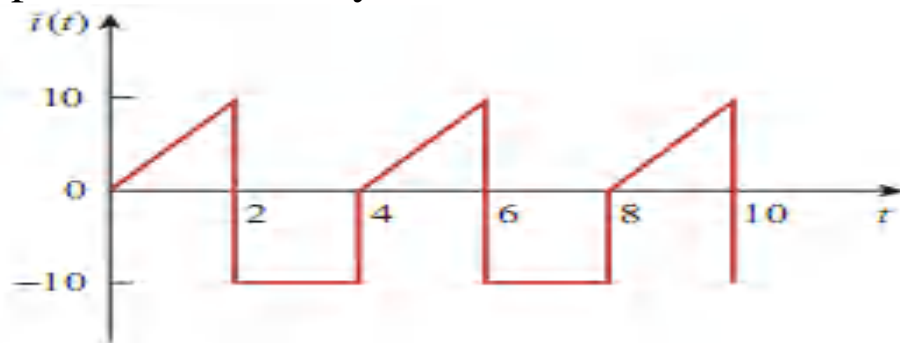


(OR)

- 4.a) Derive the expression for coefficient of coupling of two magnetically coupled coils [7M]
b) Explain the dot convention used in coupled circuits [7M]

UNIT-III

- 5.a) Determine the average value and rms value of the current waveform. If the current is passed through a 2Ω resistor, Find the average power absorbed by the resistor [7M]

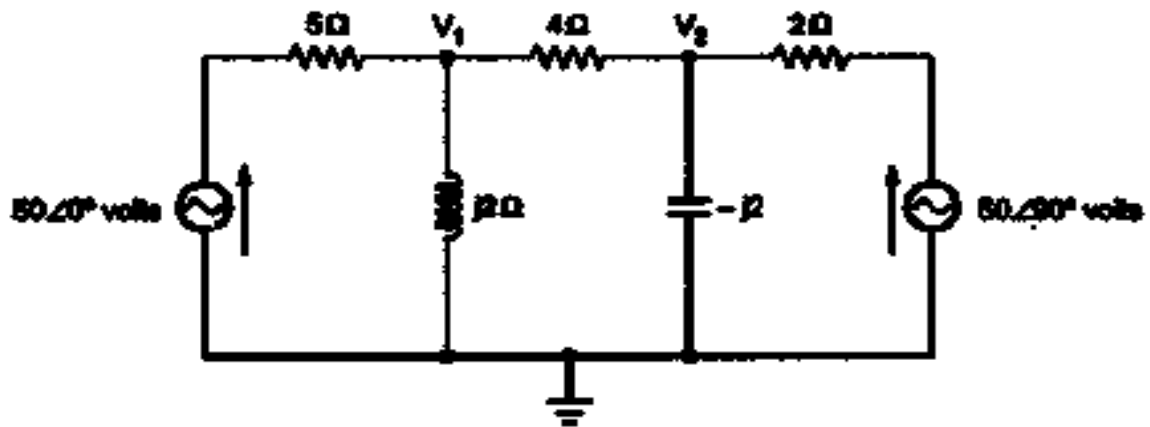


- b) An alternating voltage of $80 + j60$ V is applied to a circuit and the current flowing is $4 - j2$ A. Find the
i) impedance ii) Power consumed
iii) Phase angle and iv) Power factor [7M]

(OR)

6.a) Determine the nodal voltages V_1 and V_2

[7M]



b) Obtain the expression for current of a pure inductor circuit with a.c source and sketch the voltage and current waveforms [7M]

UNIT-IV

7.a) A series RLC circuit consists of 50Ω resistance, 0.2 H inductance and $10\text{ }\mu\text{F}$ capacitance with applied voltage of 20 V . Determine resonant frequency. Find Q- factor of the circuit. Compute the lower and upper frequency limits and the bandwidth of the circuit [7M]

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 [7M]

(OR)

8.a) Derive the expression for bandwidth, lower and upper half power frequencies of a series R-L-C Circuit [7M]

b) Explain the locus diagram for the current in a RL series circuit with
i) R variable ii) X_L variable [7M]

UNIT-V

- 9.a) A star load with $Z_A = (3+j0) \Omega$, $Z_B = (2+j3) \Omega$ and $Z_C = (2-j1) \Omega$ is connected to a 3-ph ,4-wire 100V system with the phase sequence as ACB. Find the line currents including the neutral [8M]
- b) Explain the solution of three phase unbalanced circuits [6M]

(OR)

10. Define delta system and star system. Derive the relation between line and phase quantities for a balanced 3-phase delta connected System [14M]

4 of 4

AR16

CODE: 16EE1002

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I B.Tech I Semester Supplementary Examinations, February-2018

NETWORK ANALYSIS

(Electronics & Communication Engineering)

Time: 3 Hours

Max Marks: 70M

Answer ONE Question from each Unit

All Questions Carry Equal Marks

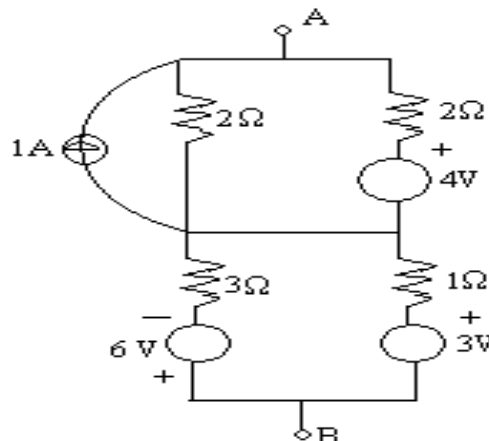
All parts of the question must be answered in one place only

UNIT-I

1. a) A circuit consisting of three resistances 12Ω , 18Ω and 36Ω respectively joined in parallel is connected in series with a fourth resistance. The whole circuit is applied with $60V$ and it is found that the power dissipated in the 12Ω resistor is $36W$. Determine the value of the fourth resistance and the total power dissipated in the circuit.
- b) A current of $1A$ is supplied by a source to an inductor of value $0.5H$. Compute the energy stored in the inductor. What happens to this energy if the source is replaced by a short circuit?

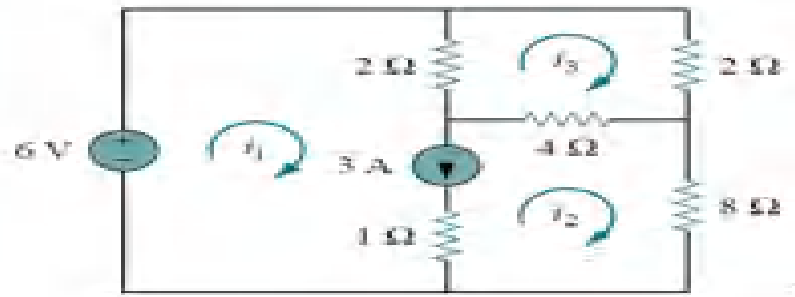
(OR)

2. a) A $12V$ car battery is connected to a $1\mu F$ capacitor. Compute the energy which will be stored in the capacitor.
- b) Using source Transformation; reduce the network between A & B into an equivalent voltage source.



UNIT-II

3. a) Use mesh analysis to determine i_1 , i_2 , and i_3 :



- b) Find the voltage V_{AB} across terminals A and B of network shown below.

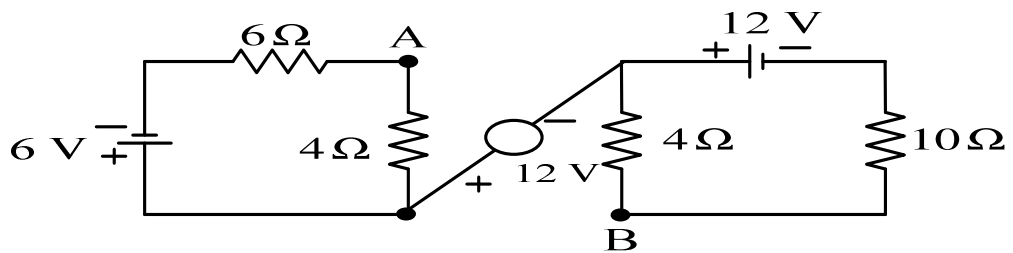
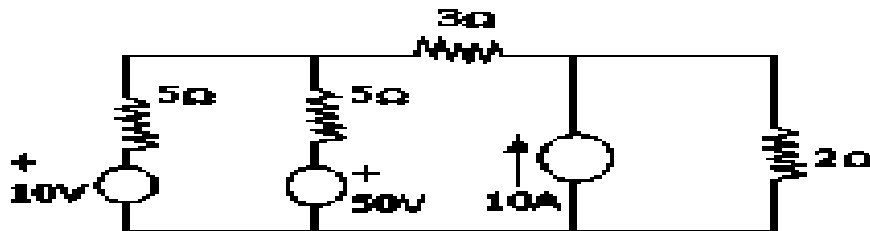


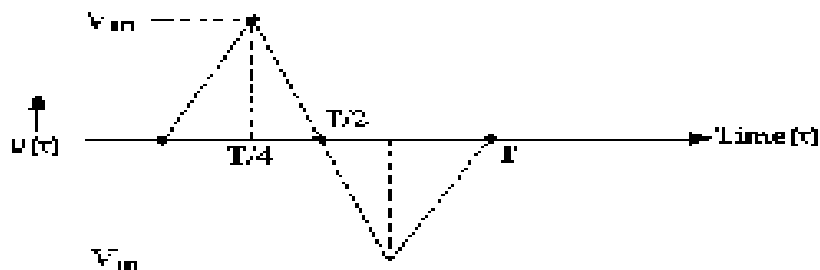
Fig. 4

(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 it $V_m = 100\text{Volts}$ as shown in figure:



UNIT-III

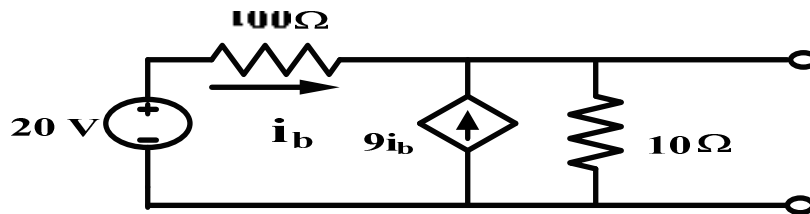
5. a) A coil resistance of 10 ohms and inductance of 0.1 H is connected across a 200 V, 50 Hz supply calculate
(i) Impedance (ii) Current (iii) Power of the circuit.
b) Derive the relation between resonant frequency and half power frequencies.

(OR)

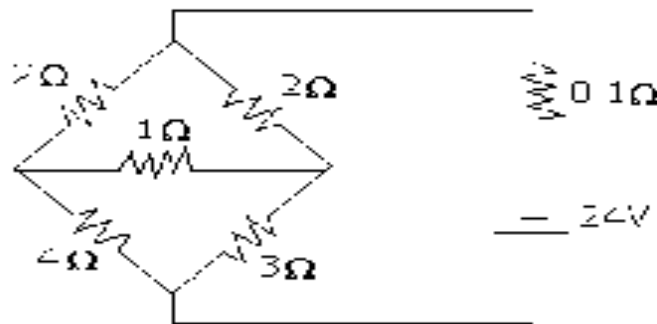
6. a) A 230 V, 50 Hz supply is connected across the resistance of 1 ohm is connected in series with a capacitor of 150 micro farad, calculate
(i) Impedance (ii) Current (iii) Power factor of the circuit.
b) Define Q of a coil and Q of a series RLC circuit. Show that the voltage across the inductor or capacitor in a series RLC circuit is Q times the supply voltage at resonance.

UNIT-IV

7. a) Obtain the Thévenin's equivalent for the following circuit:



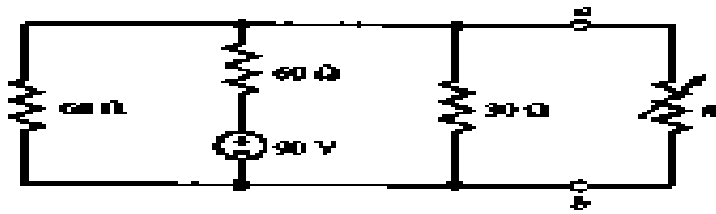
- b) Determine the current through 1 Ω resistor for the circuit shown by using Thevenin's theorem.



3 of 4

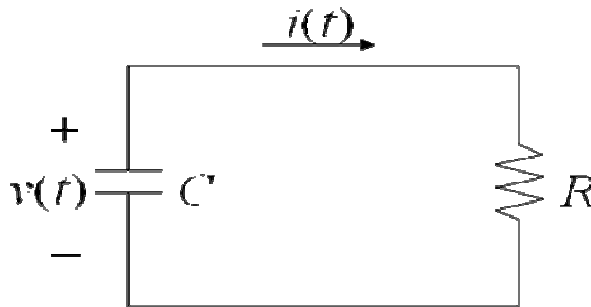
(OR)

8. a) State and explain Superposition theorem
b) Find the Maximum power that the active network to the left of terminals ' ab ' can deliver to the adjustable resistor R



UNIT-V

9. a) Define and explain hybrid parameters.
 b) Consider the source-free RC circuit show in Figure with $C = 1 \mu\text{F}$, $R = 1 \text{ k}\Omega$, and initial voltage of $v(0) = 5 \text{ V}$ across the capacitor. Find the current $i(t)$ and the maximum power dissipated by the resistor.



(OR)

10. a) A two port network has the following parameters $Z_{11} = 20 \Omega$, $Z_{12} = 5 \Omega$, $Z_{21} = 20$ and $Z_{22} = 15 \Omega$. Calculate the short circuit parameters.
 b) Derive the expression for transient response of RL series circuit with DC excitation

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I B.Tech I Semester Supplementary Examinations, February-2018****ENGINEERING DRAWING
(Common to CE, ME, CSE & IT)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) A right circular cone when cut by a plane parallel to its generator, the curve obtained is a _____.
- b) Name two recommended systems of placing the dimensions?
- c) The line joining front and top views of a point is called _____.
- d) If the front view of a line is parallel to the xy its true length is shown in ____ view.
- e) If both front and top views of a plane are straight lines the true shape will lie on _____ plane.
- f) Planes which are inclined to both the horizontal and vertical planes are called _____ plane.
- g) Differentiate between a triangular pyramid and a tetrahedron?
- h) A polyhedron having six equal square faces then that polyhedron is called _____.
- i) On isometric plane, a circle appears as _____.
- j) How would you construct an isometric scale?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2. a Construct a pentagon of side 30 mm. **6M**
- b Inscribe a regular hexagon in a circle of 50 mm diameter. **6M**
- (OR)
3. The major axis of an ellipse is 110 mm and minor axis is 70mm long. Draw an ellipse by concentric circle method. **12M**

UNIT-II

4. Draw the projections of the following points on a common reference line keeping distance between their projectors 20mm apart. **12M**
 - a) Point A is 30 mm above the H.P. and 20 mm in front of the V.P.
 - b) Point B is 30 mm above the H.P. and in the V.P.
 - c) Point C is in the H.P. and 20 mm in front of the V.P.
 - d) Point D is 20 mm above the H.P. and 25 mm behind the V.P.
 - e) Point E is in the H.P. and 25 mm behind the V.P.
 - f) Point F is 30 mm below the H.P. and 25 mm behind the V.P.
- (OR)
5. An electric switch and a bulb fixed on a wall are 5 m apart. The distance between them measured parallel to the floor is 4 m. If the switch is 1 m above the floor, find the height of the bulb and inclination of line joining the two with the floor. **12M**

UNIT-III

6. A hexagonal plane of side 30 mm has an edge in the V.P. The surface of the plane is inclined at 45° to the V.P. and the edge on which it rests is inclined at 30° to the H.P. Draw its projections. **12M**

(OR)

7. A rectangular plane of edges of 30 mm and 60 mm is resting on an edge in the H.P. The surface is inclined to the H.P. such that the top view appears as a square. Draw its projections when the edge resting on the H.P. is inclined at 30° to the V.P. **12M**

UNIT-IV

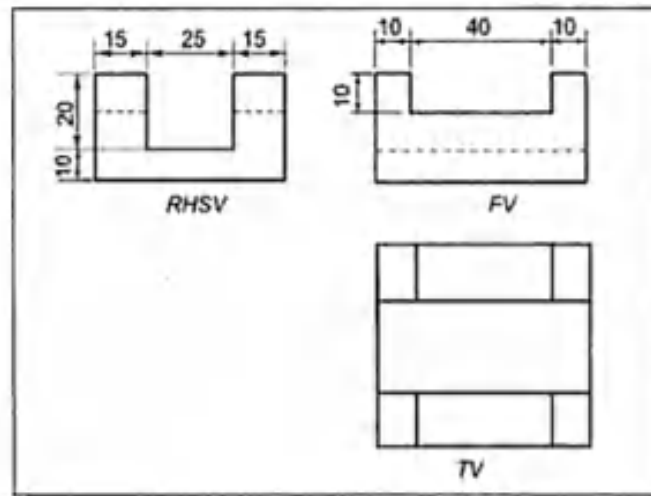
8. a A pentagonal prism of base side 30 mm and axis 60 mm is resting on one of its rectangular faces on the H.P. with axis parallel to V.P. Draw its projections. **8M**
 b A square prism of base side 40 mm and 60 mm is resting on the ground. Draw its projections when a face is perpendicular to V.P. **4M**

(OR)

9. A cylinder of base diameter 50 mm and axis 70 mm has a generator in the V.P. and inclined at 45° to the H.P. Draw its projections. **12M**

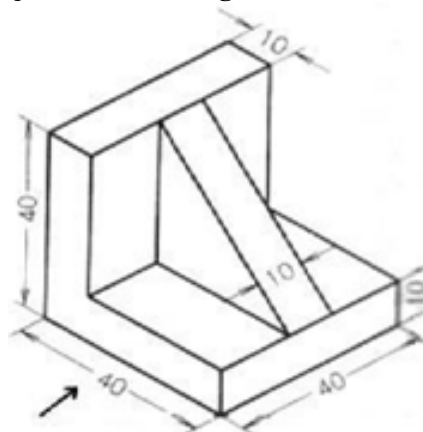
UNIT-V

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

**Fig.1.**

(OR)

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

**Fig.2.**

2 of 2

AR13

Code: 13EE1001

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, February-2018

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 a dependent source?
b) Draw the voltage – current characteristic of an inductor.
c) Define RMS value of a periodic function.
d) Explain the term power factor has applied to A.C Circuits.
e) Write at least two similarities between an electric circuit and a magnetic circuit.
f) Define coefficient of coupling.
g) Mention the types of indicating instruments.
h) Explain the basic principle of a moving iron instrument.
i) What is meant by ICDP and ICTP? What is the difference between these two?
j) What are the basic input signals?

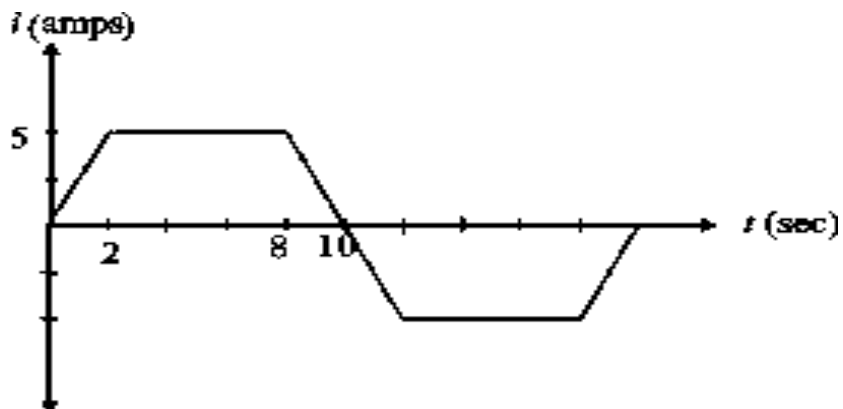
PART-B

Answer one question from each unit.

[5 x 12=60 M]

UNIT-I

2. a) What is the various types of dependent sources? Explain them in detail. [6 M]
b) The current waveform through an inductor of 30 mH is given below. Obtain the voltage waveform across it. Also sketch p(t). [6 M]



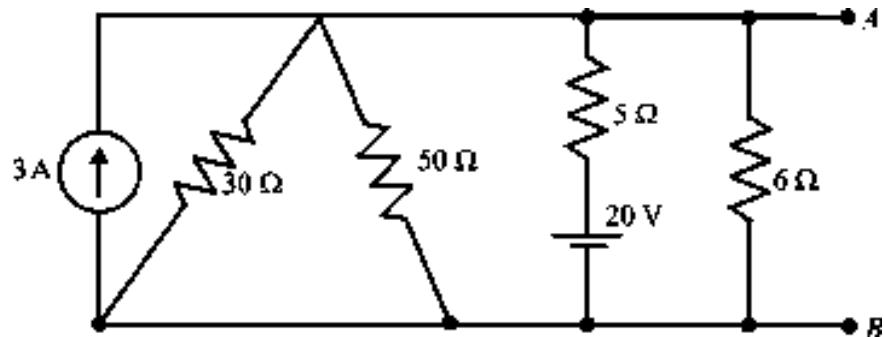
(OR)

3. a) Explain Kirchhoff's laws through a suitable circuit.

[6 M]

b) Replace the given network between the terminals A & B with a voltage source in series with a resistance.

[6 M]



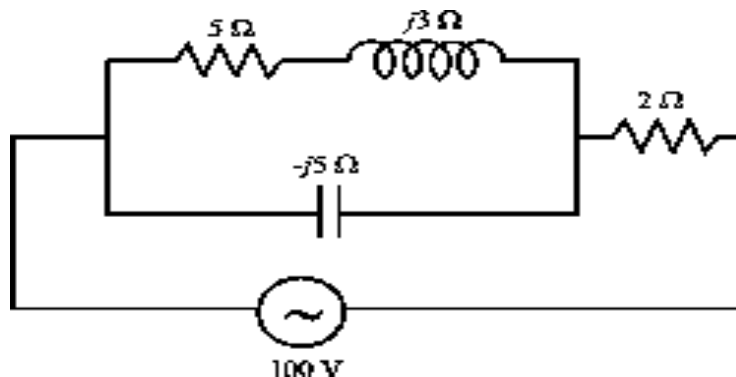
UNIT-II

4. a) A choke takes a current of 2 amps lagging 60° behind the applied voltage of 200 volts at 50 Hz. Calculate the inductance, resistance and impedance of the coil. Also determine the power consumed by the coil.

[6 M]

b) For the circuit shown below, find the power consumed by each element.

[6 M]



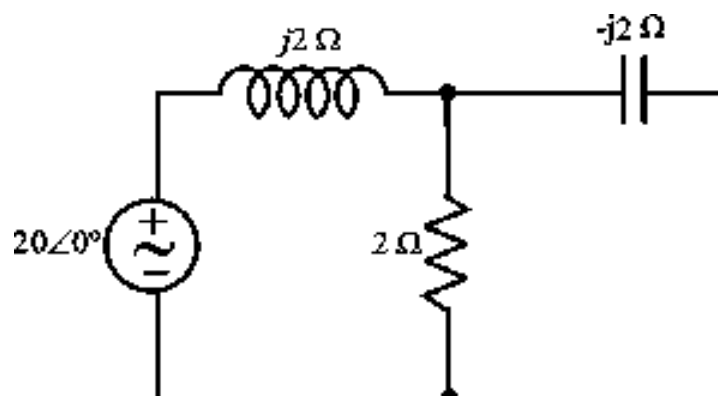
(OR)

5. a) Explain the terms: real power, reactive power, complex power through an example. Also give the units of each one of them.

[6 M]

b) Obtain the complex power supplied by the source in the figure given below

[6 M]



UNIT-III

6. a) A mild steel ring has a radius of 50 mm and a cross-sectional area of 400 mm^2 , a current of 0.5 amps flows in a coil wound uniformly around the ring and the flux produced is 0.1 m Wb. If the relative Permeability at this value of current is 200, find reluctance of mild steel. [6 M]
- b) Derive the equation for equivalent induction of 2 coils when connected in (i) series aiding and (ii) series opposing. [6 M]

(OR)

7. Two coupled coils with respective self inductances $L_1 = 0.8 \text{ H}$ and $L_2 = 0.2 \text{ H}$ have a coupling coefficient of 0.6 coil 1 has 500 turns. If the current in coil 1 is $i_1(t) = 10 \sin 200t$, determine the voltage at coil 2 and the maximum flux set up by the coil 1. [12 M]

UNIT-IV

8. What is the necessity of controlling torque in an indicating instrument and explain in detail the methods of providing it. [12 M]

(OR)

9. Mention the types of moving iron instruments and explain the construction of any one of them with neat diagrams. [12 M]

UNIT-V

10. What are the different accessories in electrical wiring and mention the purpose of each one of them? [12 M]

(OR)

11. a). Mention the basic rules in electrical wiring system. [6 M]
- b). How do you select the interior wiring system for a given building? [6 M]

AR13

CODE: 13EC1001 **SET-1**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2018

ELECTRONIC DEVICES
(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is magnetic deflection sensitivity of CRT?
- b) What is parallel electric and magnetic fields?
- c) What is diffusion?
- d) What is mean lifetime of hole?
- e) What is valley current of tunnel diode?
- f) What are the applications of PIN diode?
- g) What is early effect?
- h) What is transistor emitter efficiency?
- i) What are the uses of UJT?
- j) What is enhancement-type MOS FET?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What is electrostatic and magnetic - deflection systems and compare? 7M
 - b) Why two sets of deflecting plates are required in CRO and explain their functions? 5M
- (OR)
3. a) Derive the electrostatic deflection sensitivity of CRT? 6M
 - b) Explain magnetic focusing of CRT? 6M

UNIT-II

4. a) With a neat sketch explain the carrier concentration in an intrinsic semiconductor? 7M
- b) Derive the equation of conservation of charge and also explain its significance? 5M

(OR)

5. a) What is generation and recombination of charges? 4M
b) Explain energy band diagrams of semiconductors and metals? 8M

UNIT-III

6. a) What is a energy band? Explain the energy band of a PN diode? 6M
b) What is a ripple? How can minimize ripples in a full wave rectifier? 6M

(OR)

7. a) Explain the principle of operation of variable capacitor diode? 7M
b) Draw the V – I characteristic of diode and explain the temperature dependence ? 5M

UNIT-IV

8. a) Explain p-n-p transistor using Ebers-Moll model? 6M
b) Explain how a Transistor can act as an amplifier? 6M
(OR)
9. a) Explain any two applications of photo transistor? 6M
b) List the current components and parameters of transistor & Explain two from each. 6M

UNIT-V

10. a) List the applications of UJT and explain? 6M
b) What is enhancement and depletion mode of FET? Explain with analytical way? 6M
(OR)
11. a) Compare performance of BJT & JFET? 6M
b) Explain the operation of Lateral double diffused MOSFET ? 6M