AR16

CODE: 16ME1001   SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, January-2019
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. In a map a 36 km distance is shown by a line 45 cms long. Calculate the R.F. and construct a plain scale to read kilometers and hectometers, for max. 12 km. Show a distance of 8.3 km on it.

(OR)

2. Draw a straight line AB of any length Mark a point F, 60mm from AB. Trace the path of a point P moving in such a way, that the ratio of its distance from the point F, to its distance from AB is 2:3. Plot at least 10 points. Name each curve. Draw a normal and tangent to each curve at a point on it. 45mm from F.

UNIT-II

3. Draw the projections of the following points on a common reference line:
   a. A, 25mm above the HP and 35mm in front of the VP
   b. B, 25mm above the HP and 40mm behind the VP
   c. C, 30mm below the HP and 40mm behind the VP
   d. D, 30mm below the HP and 35mm in front of the VP
   e. E, 25mm above the HP and in the VP.
   f. F, 30mm below the HP and in the VP
   g. G. in both HP& VP.

(OR)

4. A line RS 70 mm long has its end R 20 mm above HP and 25 mm in front of VP. The line is inclined to HP and parallel to VP. Draw its projections when the distance between the projectors is 45 mm.

UNIT-III

5. Draw the projections of a regular hexagon of 25 mm side, having one of its sides in the H.P. and inclined at 60° to the V.P. and its surface making an angle of 45° with the H.P.

(OR)

6. A semi circular plate of 80 mm diameter has its straight edge in the VP and inclined at 45^0 to HP. The surface of the plate makes an angle 30^0 with the VP. Draw its projections

UNIT-IV

7.   A hexagonal prism, side of base 30mm and axis 70mm long rests with one of the edges of its base on HP, such that its axis is inclined at 30° to HP. Draw the projections.

(OR)

8.   A cone of base diameter 60mm and altitude 75mm lies on its base on the HP and axis parallel to the VP. Draw its projections.
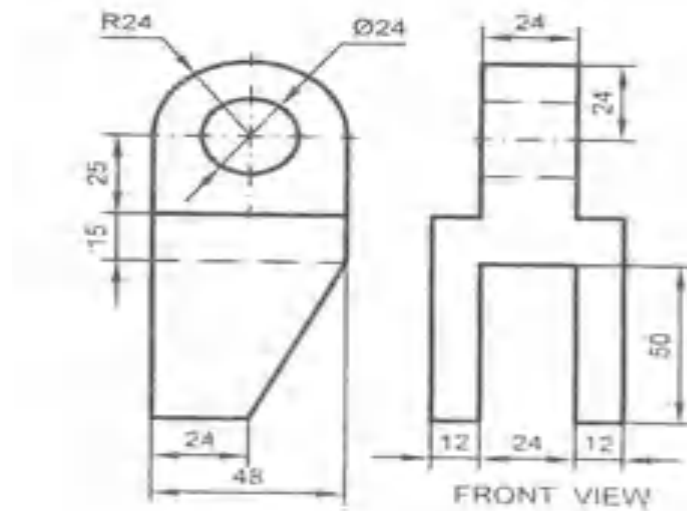
UNIT-V

9.   Draw the following views of the object shown pictorially in below fig.
     (i) Front view. (ii) Top view. (iii) Side view from the right
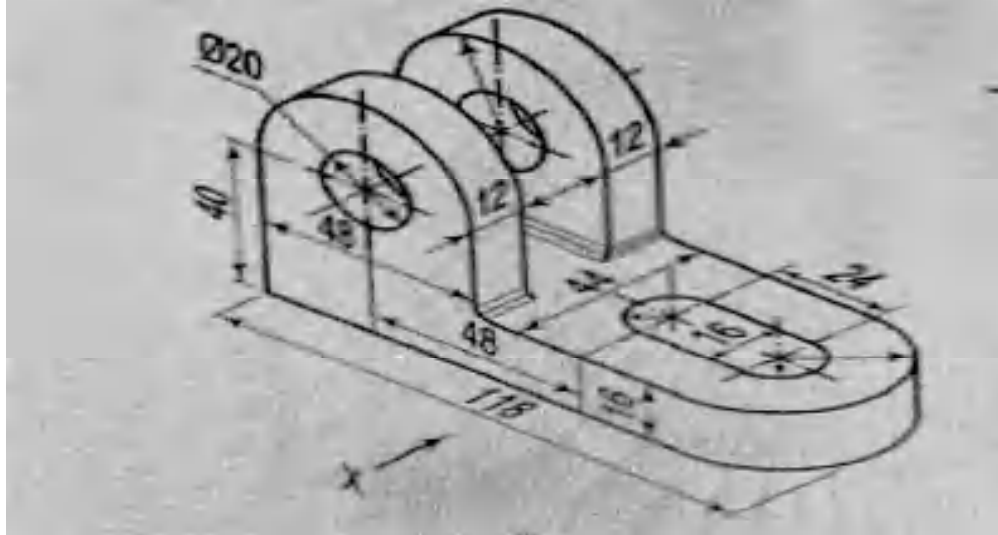
(OR)

10. Draw the isometric view of the following orthographic views?

2 of 2

***

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, January-2019

BASIC ELECTRIC CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

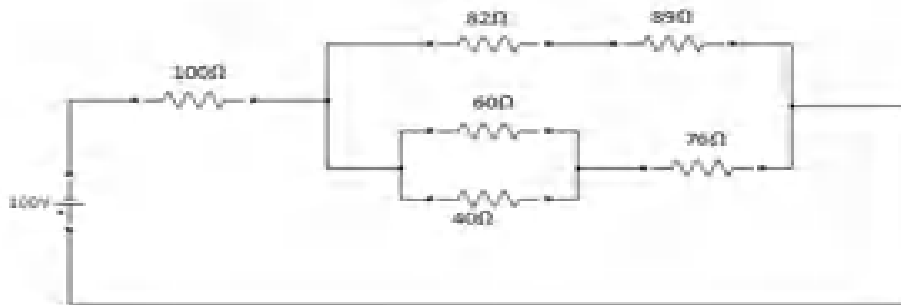**Time: 3 Hours**   **Max Marks: 70M**

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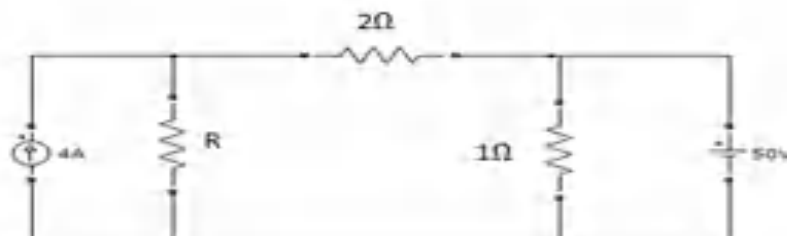All parts of the question must be answered in one place only

UNIT-I

1 a) Explain the source transformation with example.   **[6M]**

   b) For the circuit shown in fig 1.find the current through each   **[8M]**
      resistance.

Fig.1

(OR)

2 a) Explain star to delta transformation with an   **[6M]**
      example

   b) What is the value of R such that the power supplied by   **[8M]**
      both sources are equal?

Fig.2

3. a) Explain the different types induced emf`s   **[6M]**
   b) Determine the current in all branches of the circuit   **[8M]**
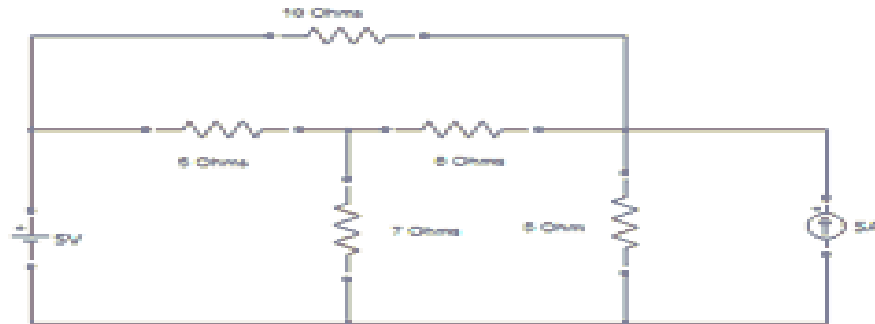   shown in fig. 3 using mesh analysis

Fig.3

(OR)

4. a) Obtain the expression for mutual inductance   **[6M]**
      between two coupled coils.
   b) Obtain the nodal voltage of the circuit shown in   **[8M]**
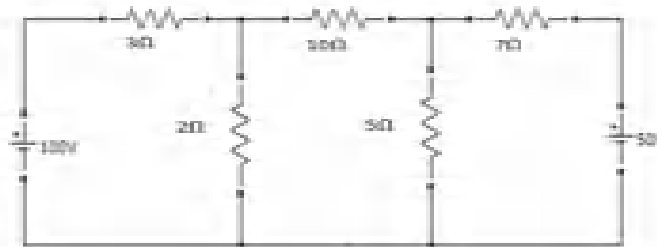   fig.4

Fig.4

<u>UNIT-III</u>

5. a) An RLC series circuit has a current which lags the   **[6M]**
      applied voltage by 45^0. The voltage across the
      inductance has a maximum value equal to twice the
      maximum value of voltage across the capacitor.
      Voltage across the inductance is 300sin (1000t) and
      R=20Ω. Find the value of inductance and
      capacitance?

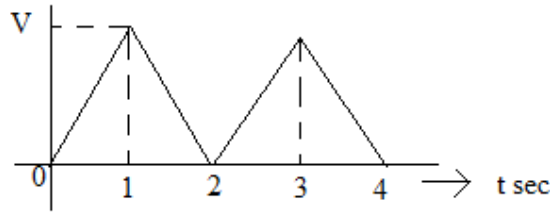b) Obtain the RMS value of the voltage wave form shown in fig.5 **[8M]**

Fig.5

(OR)

6. a) Explain the significance of 'j' operator. What are the different forms of expressing the sinusoidal quantity in complex form? **[6M]**

   b) The voltage of a circuit is v=200sin(ωt+30°) and the current is i=50sin(ωt+60°) Calculate **[8M]**

   i) The average power, reactive volt amperes and apparent power

   ii)Find the circuit elements,if ω=100π rad/sec.

<u>UNIT-IV</u>

7. An RLC series circuit with a resistance of 10Ω inductance of 0.2 H and a capacitance of 40μF is supplied with a 100V supply at variable frequency. Find the following w.r.t the series resonant circuit. (a) frequency at which resonance takes place (b) current (c) power (d) power factor (e) voltage across RLC at that time (f) quality factor (g) half power points (h) resonance and phasor diagrams? **[14M]**

(OR)

8. a) Obtain the expression for the frequency at which maximum voltage occurs across the capacitance in a series resonance circuit in terms of the Q factor and resonant frequency **[7M]**

b) For a series RL circuit having variable resistance and fixed inductance, plot the current locus and determine the maximum power consumed. Assume $X_L=25\Omega$ and $R=50\Omega$, the voltage is 200V, 50Hz. **[7M]**

9. a) Explain how the reactive power is measured in a 3-phase balanced system **[7M]**

b) A balanced delta connected load takes a line current of 15 A when connected to a balanced three phase 400 V system. A wattmeter with its current coil in one line and its potential coil between the two remaining lines read 2000 W. Determine the load impedance **[7M]**

(OR)

10. Explain the relation between line, phase voltages and currents in a balanced three phase star connected system. **[14M]**

***

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, January-2019
NETWORK ANALYSIS
(Electronics & Communication Engineering)

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) When a DC voltage is applied to a capacitor, the voltage across   6M
its terminals is found to build up in accordance with $V_c = 50(1-e^{-100t})$. After a lapse of 0.01 sec the current flow is equal to 2mA.
(a)Find the value of capacitance
(b)How much energy is stored in electric field at this time?

    b) In the network shown, each resistor is 10 Ω. Compute the   8M
equivalent resistance.
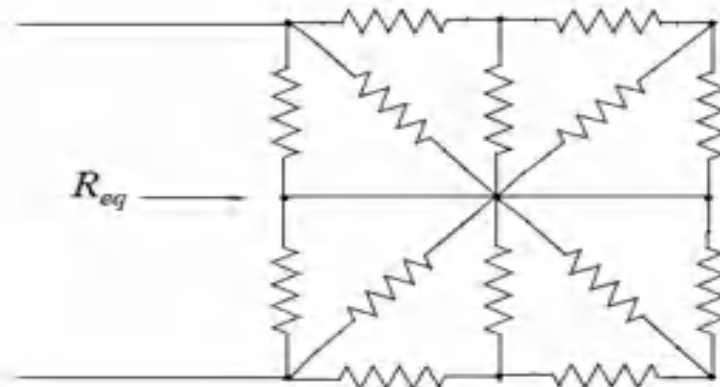
(OR)

2. a) Find equivalent inductance between teriminals a & b   8M
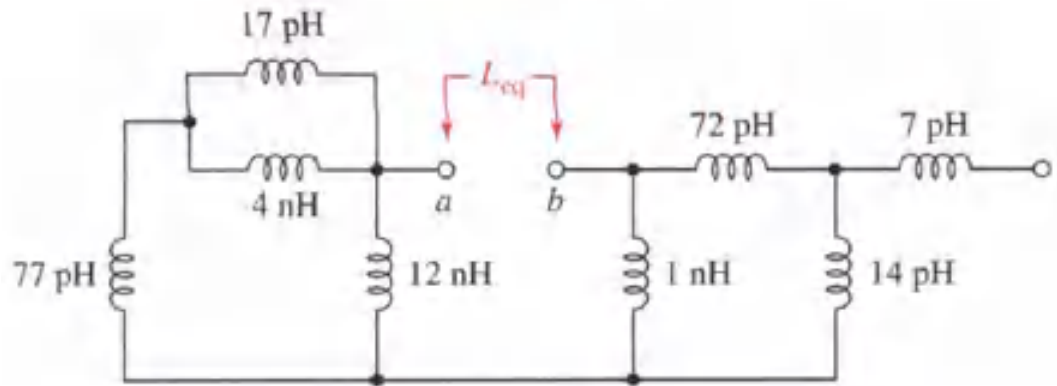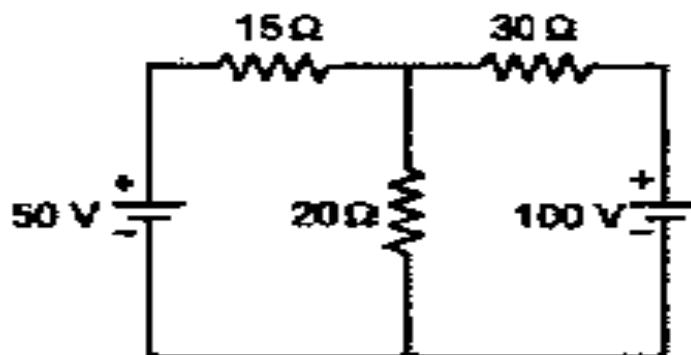

    b) Discuss about Source transformation with suitable example.   6M

UNIT-II

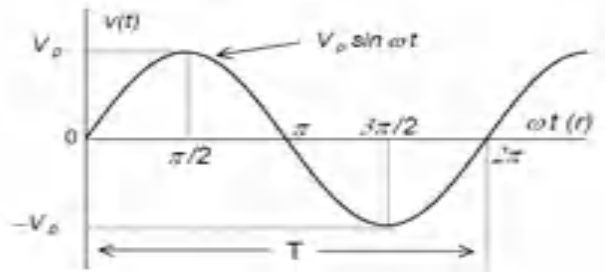3. a) Apply Kirchhoff's law's to the given circuit   6M

    b) Use nodal analysis, find the voltage at each node of given   8M
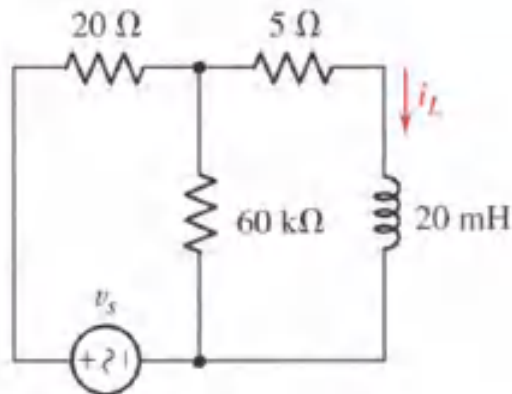   circuit below.

(OR)

4. a) Compute the average value of the sinusoidal waveform   6M
        shown in Figure, where denotes the peak (maximum) value of
        the sinusoidal voltage.

    b) Explain about Star–Delta transformation with example.   8M

UNIT-III

5. a) Define impedance, admittance , reactance and conductance.   6M
    b) Let Vs = 20 cos 500t v in the circuit .After simplifying the   8M
   circuit alittle, find i_L (t).

(OR)

6.   Obtain the resonant frequency and quality factor and   14M
        bandwidth for a series RLC circuit.

UNIT-IV

7. a) State and explain Norton's theorem with suitable example?   6M
    b) Apply Superposition theorem for the given circuit below.   8M

(OR)

8. a) If any value whatsoever may be selected for R_L in the circuit of figure, what is the maximum power that could be dissipated in R_L?　8M
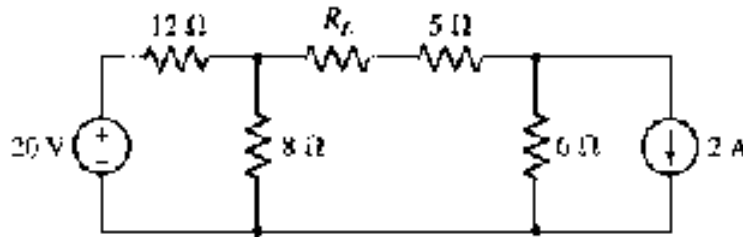
b) Explain Reciprocity theorem with suitable example　6M
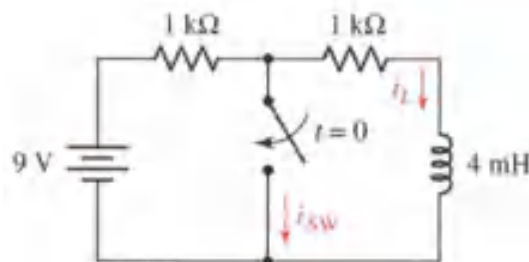
UNIT-V

9. a) Obtain h parameters in terms of Y parameters　7M
   b) Find [z] parameters for the two port shown in figure　7M

(OR)

10. a) After being in the configuration shown for hours, the switch in the circuit of figure is closed at t=0.At t=5micro sec, calculate: (i) i_L (ii) i_{sw}.　8M

b) Explain in brief the response of RLC parallel circuit　6M

AR13

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define the term RF used in scales?
    b) What are the types of set squares used in Engineering Drawing?
    c) Define orthographic projection?
    d) Write is the position of point in first angle projection?
    e) List the types of planes used in orthographic projection?
    f) If the plane is inclined to HP and corner rests on HP, then what is the position of plane assumed in simple position?
    g) List the solids of revolution?
    h) Define a polyhedron?
    i) Write the advantage of Isometric drawing?
    j) What is the position of top view in first angle projection?

PART-B

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

UNIT-I

2. Construct a diagonal scale of R.F=1/4000 to show meters and long enough to measure up to 500 meters.   12M

(OR)

3. To construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is 2/3.Also Draw tangent and normal at any point on the curve.   12M

UNIT-II

4. a) Draw the projections of a point 'A ' lying on V.P and 70 mm above HP.   4 M
    b) A line AB 50 mm long is perpendicular to V.P and parallel to HP. Its end A is 20 mm in front of V.P and the line is 40 mm above HP. Draw the projections of the line.   8M

(OR)

5. A line PQ 100 mm long is inclined at 30° to the H.P.and parallel to the V.P. Draw its projections.   12M

UNIT-III

6. a) A square ABCD of 40 mm side has a corner on the H.P. and 20 mm in front of the V.P. All the sides of the square are equally inclined to the H.P. and parallel to the V.P. Draw its projections?   4M
    b) Draw the projections of a circle of 50 mm diameter having its plane vertical and inclined at 30° to the V.P. Its centre is 30 mm above the H.P. and 20 mm in front of the V.P.   8M

(OR)

7. Draw the projections of a regular hexagon of 25 mm side, having one of its sides in the H.P. and inclined at 60° to the V.P. and its surface making an angle of 45° with the H.P.   12M

1 of 2

AR13

UNIT-IV

8. a) A cube of 50 mm long edge is resting on the H.P.with its vertical faces equally inclined to the V.P. Draw its projections. 4M

   b) Draw the projections of a pentagonal prism, base 25 mm side and axis 50 rnm long ,resting on one of its rectangular faces on the H.P. with the axis inclined at 45^c to the V.P. 8M

(OR)

9. Draw the projections of a cone, base 45 mm diameter and axis 50 mm long, when it is resting on the ground on its base circle. 12M
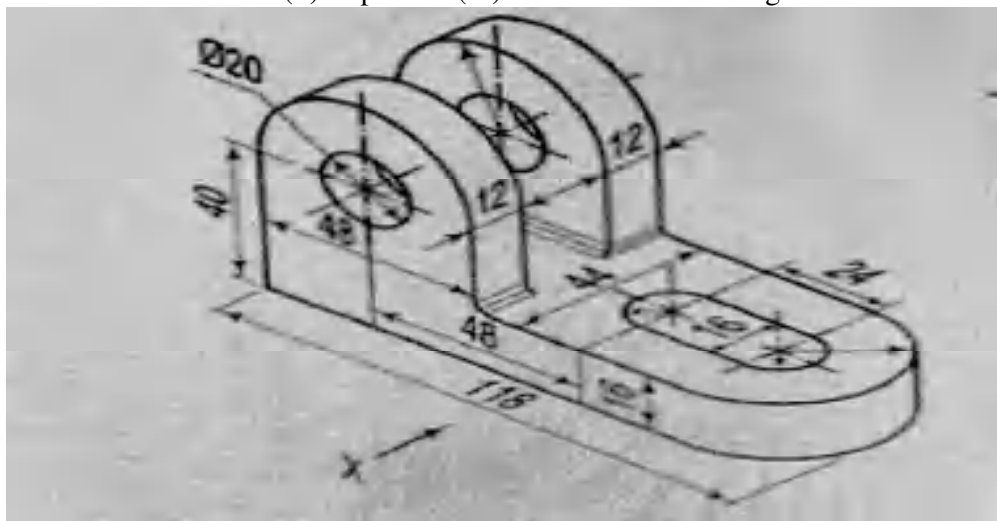
UNIT-V

10. Draw the isometric view of the casting shown in two views in below fig. 12M
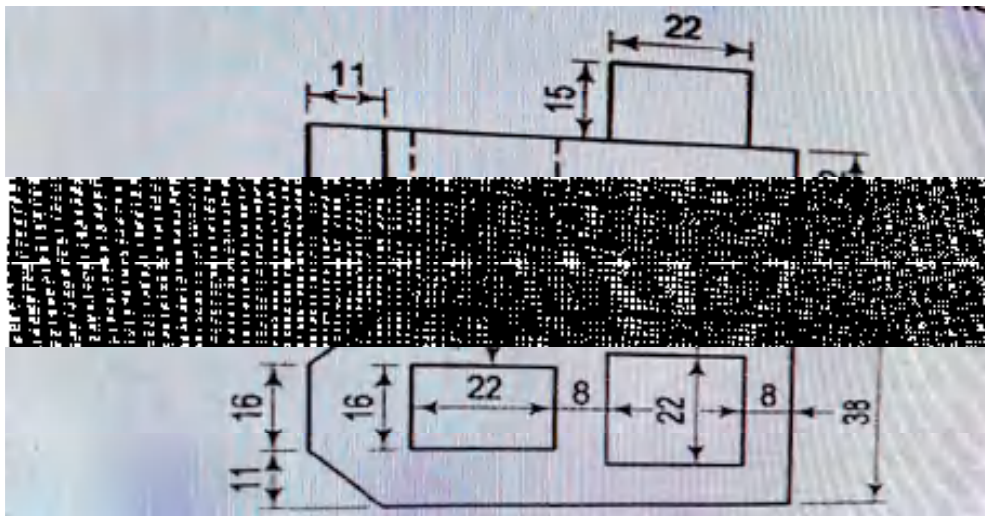
(OR)

11. Draw the following views of the object shown pictorially in below fig. (i).(i) Front view. (ii) Top view. (iii) Side view from the right 12M

AR13

PART-A

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

1. a) Write the relation between E and V
    b) The force on a charged particle in a magnetic field depends on
    c) What is meant by doping
    d) Define fermi level
    e) Define Avalanche break down
    f) Draw the circuit of a Full Wave Rectifier
    g) Compare the widths and doping of collector, base and emitter.
    h) Define Reach Through
    i) Write any two differences between BJT and UJT
    j) List any two applications of Dual Gate MOSFET

PART-B

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

UNIT-I

2. a) Explain the operation of CRT   6M
    b) In a parallel plate diode, the cathode and anode are spaced 6M
        5mm apart and the anode is kept at 220V d.c with respect to
        cathode. The initial velocity of an electron is $2X10^6$ m/s in the
        direction towards anode. Calculate the velocity and time of an
        electron at midway between cathode and anode.
                                (OR)
3. a) Derive the expression for magnetic deflection and sensitivity   6M
    b) Derive the expression for motion of charge in constant   6M
        electric field

UNIT-II

4. a) If a donar impurity is added to the extent of one atom per 10^8 6M
germanium   atoms, calculate its resistivity at 300^0K .If its
resistivity without addition of impurity at 300^0K is 44.64Ω-
cm. comparing two values, comment on the result.
$\mu n = 3800 cm^2/V$-sec

   b) Explain Hall effect and list any two applications of it.   6M

(OR)

5. a) Summarize the formation of P-Type semiconductor.   6M
   b) Explain the importance of continuity equation.   6M

UNIT-III

6. a) Explain the characteristics of PN junction diode.   10M
   b) List any two applications of Varactor diode   2M

(OR)

7. a) Explain the formation of diffusion capacitance and write the   6M
expression for it.
   b) Explain how Zener diode can be used as a regulator in reverse   6M
bias region.

UNIT-IV

8. a) Draw the characteristics of transistor in Common Emitter   6M
configuration and explain them.
   b) Explain the different current components present in the   6M
transistor and describe them

(OR)

9. a) Write the analytical expression for collector current I_C and I_E 6M
and show that $I_E = I_C + I_B$
   b) Explain the constructional details and operation of a transistor   6M

UNIT-V

10. a) Explain the operation of Depletion MOSFET with the help   6M
of its characteristics.
   b) List any five advantage and one disadvantage of FET over   6M
BJT

(OR)

11. a) Explain the operation of V-grove MOSFET.   6M
   b) Explain the operation of SCR with the help of its   6M
characteristics

***