Set-01

Code: 13EE1001
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech. I Semester Supplementary Examinations, March 2015
FUNDAMENTALS OF ELECTRICAL ENGINEERING
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 hours   Max Marks: 70
Part - A
Answer all Questions   [10×1=10M]
1.   a) If a current of 5 A flows for 2 minutes, find the quantity of electricity transferred?
      b) Define ohm's Law ?
      c) What is the difference between conductors and insulators?
      d) What capacitance must be connected in series with a 30 µF capacitor for the equivalent
         capacitance to be 12 µF?
      e) Define Peak factor?
      f) An alternating current completes 5 cycles in 8 ms. What is its frequency?
      g) Define magnetic flux and magnetic flux density ?
      h) Define passive element?
      i) Define controlling torque?
      j) The three similar lamps, each rated at 240 V, connected in parallel across a 240 V
         supply. Then draw the circuit diagram for the given description?

Part – B
Answer one question from each unit   [5×12=60M]

Unit - I

2.   a) Explain the concept of linear and nonlinear elements with suitable examples?   [6M]
      b) Explain the Kirchoff's laws with suitable examples?   [6M]

OR

3.   a) For the series-parallel arrangement shown in Fig.1, find (i) the supply current, (ii) the
         current flowing through each resistor and (iii) the potential difference across each
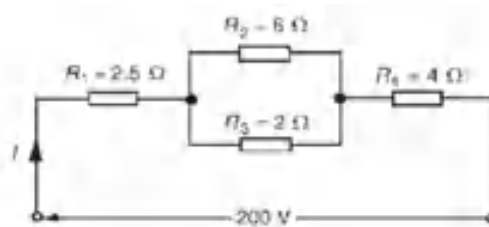   resistor.   [6M]

Fig.1

      b) what are the different types of sources and explain each one ?   [6M]

Unit – II

4. For the periodic wave form shown in Fig.2 determine i) frequency ii) average value over half a cycle iii) RMS Value iv) Form factor v) Peak factor   [12M]
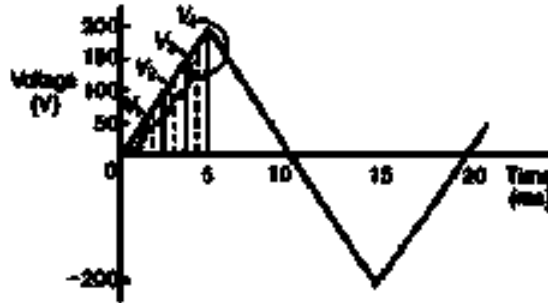

Fig.2

OR

5. A Coil of inductance 159.2 mH and resistance 20   is connected in series with 60   resistor to a 240 volts, 50 Hz supply. Determine i) the impedance of the circuit ii) current in the circuit, iii) the circuit phase angle iv) the potential difference across 60   resistor v) the potential difference across the coil f) draw the circuit phasor diagram showing all voltages.   [12M]

Unit – III

6. A Closed magnetic circuit of cast steel contains 6 cm long path of cross-sectional area 1 cm^2 and a 2 cm path of cross -sectional area 0.5 cm^2 . A coil of 200 turns is wound around the 6 cm length of the circuit and a current of 0.4 A flows. determine the flux density in the 2 cm path and 6 cm path, if the relative permeability of the cast steel is 750.

OR   [12M]

7. Find the relation between self inductance, mutual inductance and coefficient of coupling?   [12M]

Unit-IV

8. Explain the working principle of Moving iron instrument? derive the expressions for different torques of moving iron instruments?   [12M]

OR

9. What are the different types of instruments, explain in detailed ?   [12M]

Unit - V

10. What are the different types of main switches, explain with suitable applications ? [12M]

OR

11. Explain about all electrical wiring accessories in detail ?   [12M]

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**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,
TEKKALI (AUTONOMOUS)**
I B. Tech I Semester Supplementary Examinations, March 2015
ENGINEERING DRAWING
(Common to Civil, ME, CSE, IT)

Time: 3 hours   Max Marks: 70

PART-A   [10X1=10M]

Answer all questions

1. a) List out instruments as per IS 9609 provision
   b) Define eccentricity values for parabola, hyperbola and ellipse
   c) List out the main differences between first angle projection and third angle projection.
   d) What is the section (curve) obtained when a sectional plane intersects a right circular cone such that the plane cuts all the generators on one side of the apex?
   e) What is an orthographic projection?
   f) In orthographic projections, the apparent angles are always _____ than the true angles and the apparent lengths are always _____ than the true lengths.
   g) What are the dimensions of the solid that can be seen in the side view?
   h) What are the differences between a vernier and diagonal scale?
   i) What is the difference between Isometric view and Isometric projection?
   j) Why the second and fourth angle projections are not followed in projections?

PART-B

Answer one question from each unit   [5X12=60M]

UNIT-I

2. a) Construct Pentagon and Hexagon by using any two different methods.
   b) Two points F and F` are located on a sheet of paper and are 100mm apart. A point P moves on the sheet such that the difference of its distance from F and F` always remains 50mm. Find the locus of P. Draw a tangent and normal to the locus at any point.

(OR)
1-3

AR13   SET 1

3. a)   Define the representative fraction. Find the representative fraction if an area of 144 sq. cm on a map actually represents an area of 36 sq. km.

    b)   Construct a scale of R.F. = 1 / 2.5 to show decimeters and centimeters and by a vernier to read millimeters, to measure up to 4 decimeters. On this scale show (a) 3.54 dm (b) 2.5 cm and (c) 8 mm.

UNIT-II

4. a)   Draw the projections of a 90 mm long line inclined to the VP and parallel to the HP. The line is 10 mm below the HP. One end of the line is 15 mm in front of the VP and the other end is 40 mm behind the VP. Find the inclination of the line with the VP.

    b)   Draw the projections of a 90 mm long line parallel to both the reference planes. The line is 20 mm behind the VP and 40 mm below the HP.

(OR)

5.   Draw the projections of the following points on a common reference line keeping the distance between their projections 30 mm apart.

   i.   Point P is 35 mm below the H.P. and on the V.P.
   ii. Point Q is 40 mm in front of the V.P. and 25 mm below the H.P.
   iii. Point R is 45 mm above the H.P. and 20 mm behind the V.P.
   iv. Point S is 30 mm below the H.P. and 45 mm behind the V.P.
   v.   Point T is both on the H.P. and the V.P.

UNIT-III

6.   An equilateral triangle ABC of side 60mm lies with A on the H.P. and B on the V.P. and with side AB making 45^0 and 30^0 respectively with the H.P. and V.P. The side CA makes an angle 25^0 with the H.P. Draw the projection of the triangle ABC.

(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 60^0 to the V.P., and its surface making an angle of 45^0 with the H.P.
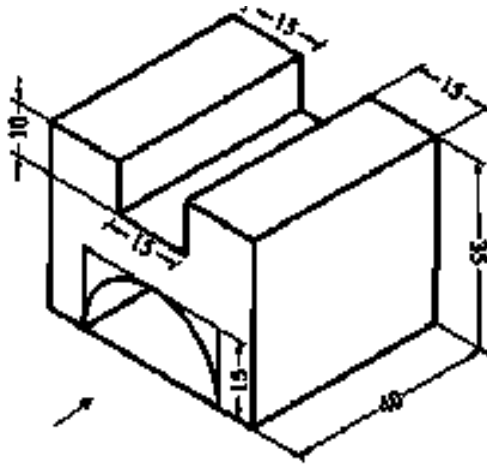
AR13   SET 1

UNIT-IV

8.   Draw the projections of a cone, base 60 mm diameter and axis 120 mm long, lying on the H.P. on one of its generators with the axis parallel to the V.P

(OR)

9.   Hexagonal pyramid base 25 mm side and axis 55 mm long, has one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to HP and inclined at 60^0 to the VP. Draw its projections when the apex is on VP.
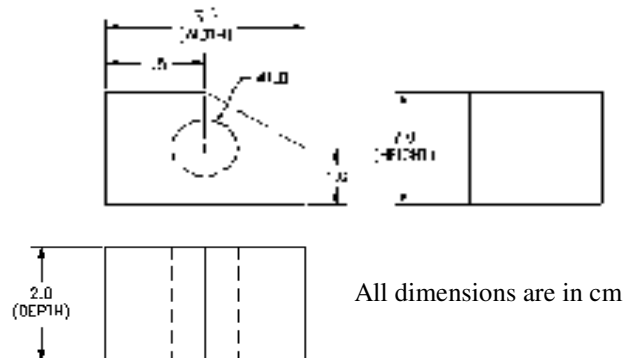
UNIT-V

10.   Draw orthographic projections of the isometric projection given in figure

(OR)

11.   Draw the isometric projection of the component shown in three views in Figure 2.

All dimensions are in cm

Figure 2
3-3

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMUOUS)
1 B. Tech 1 Semester Supplementary Examinations, March 2015
ELECTRONIC DEVICES
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 hours   Max Marks: 70

PART – A

Answer all questions   **[10x1=10M]**

1. a) Why focusing is needed in CRT?
    b) Give the expression of force on an electron moving in a Magnetic field.
    c) Sketch the Energy band diagram of N-type semiconductor.
    d) Write the expression of Fermi level for an intrinsic semiconductor.
    e) Sketch schematic circuit symbol of Varactor diode.
    f) Define PIV of a rectifier circuit.
    g) Define current gain of CB transistor.
    h) List any two applications of Photo transistor.
    i) What are the limitations of FET over BJT?
    j) Draw the Drain characteristics of Enhancement N-MOSFET.

PART-B

Answer one question from each unit   **[5X12=60M]**

Unit-I

2. a) Define Electric Field strength (E) and Potential (V) in an electric field. Derive the
       relation between E and V.   [6M]
    b) Derive Magnetic Deflection Sensitivity in a CRT with necessary diagram.   [6M]

(OR)

3. a) Discuss the motion of an electron in a perpendicular electric field.   [4M]
    b) A CRT is designed to have a deflection sensitivity of 0.3 mm/Volt. The plates are
       required to be 3 cm long and 0.6 cm apart. The distance of the screen from the center of
       the plate is to be 20 cm. What should be the fixed anode voltage? Find the deflection
       sensitivity of a charged particle of charge same as electron and its mass 2000 times as
       large as the electron.   [8M]

Unit-II

4. a) Derive the expression for conductivity of P-type semiconductor.   [6M]
    b) Show that the Fermi level Energy of Intrinsic semiconductor is equal to average of the
        Conduction band Energy and Valance band Energy.   [6M]

(OR)

5. a) Derive the expression of Fermi level Energy for N-type semiconductor.   [6M]
    b) Explain how the Hall Effect is used to determine the type of semiconductor.   [6M]

Unit-III

6. a) Define diffusion capacitance of a Diode and derive its expression.   [6M]
    b) With the help of energy band diagram, explain the distribution of energy in open circuit PN diode.   [6M]

(OR)

7. a) Explain Zener and Avalanche break-down in Zener diode.   [8M]
    b) Draw the circuit diagram of Half Wave Rectifier and explain its operation.   [4M]

Unit-IV

8. a) Explain the construction detail and principle of PNP Bipolar junction transistor. [6M]
    b) Obtain the relation between α, β and γ of a transistor.   [6M]

(OR)

9. a) Derive the expression of total Collector Current (I_C) in a Common Emitter transistor.   [6M]
    b) Sketch Input and output characteristics of Common Collector transistor. Explain different region of operation.   [6M]

Unit-V

10. a) Explain the construction and operation of P channel JFET in detail.   [6M]
    b) Compare BJTs and FETs.   [6M]

(OR)

11. a) Draw the Drain and Transfer characteristics of Depletion N-MOS and explain.   [6M]

    b) Explain different mode of operation of SCR.   [6M]