K S R M College of Engineering (Autonomous), KADAPA – 516 003
B.Tech 3rd Semester Supple Examinations, 2019 - Model Paper
ENGINEERING MECHANICS
(Civil Engineering)

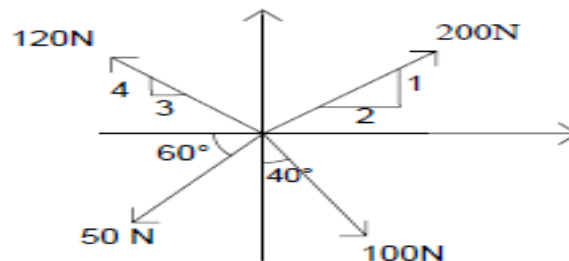Time: 03:00 Hrs.   Max. Marks: 70

Answer any FIVE questions choosing one question from each unit
All questions carry Equal Marks
UNIT 1

1)   (a) **How do you classify force system?**   7M
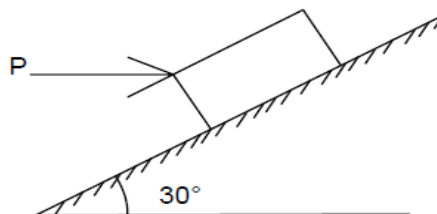
(b) **A system of four forces acting on a body is as shown in the figure below. Determine the resultant of given force system.**   7M

OR

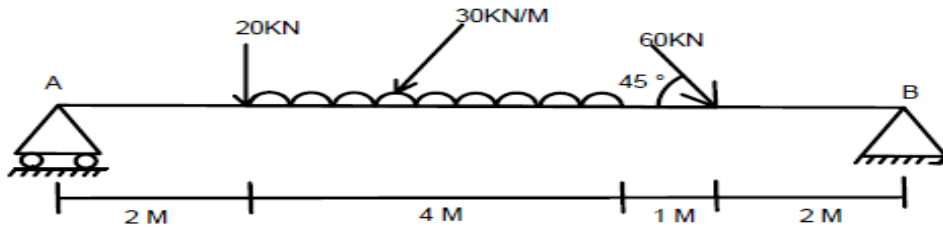2.   **(a) state and prove Varigon's theorem.**   7M

(b)Determine the horizontal force P to be applied to a block of weight 1500N to hold it in position on a smooth inclined plane AB which makes an angle of 30° with horizontal as shown in figure.   7M

UNIT 2

3.   **(a) Explain the laws of solid friction.**   7M

(b) Find the reactions at supports A and B of loaded beam shown in figure.   7M

OR

4.   (a) A simply supported beam AB of 7m span is subjected to (i) 4kNm clockwise couple at 2m from A (ii) 8kNm anticlockwise couple at 5m from A and a triangular load with zero intensity at 2m from A is increasing to 4kN/m at a point 5m from A. determine the reaction at A and B.   7M

(b) A body of weight 500N is pulled up by an inclined plane by a force of 350N. The inclination of plane is 30 degree to the horizontal and the force is applied parallel to the plane. Determine the coefficient of friction.   7M
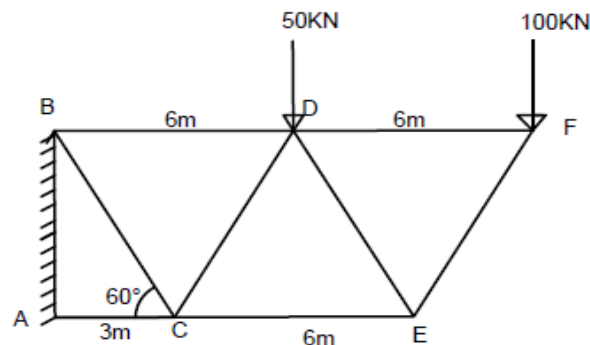
UNIT 3

5.   Determine the forces in all the members of truss shown in the figure. All the inclined members are 60 degrees to horizontal and length of each members is 2 m.   14M
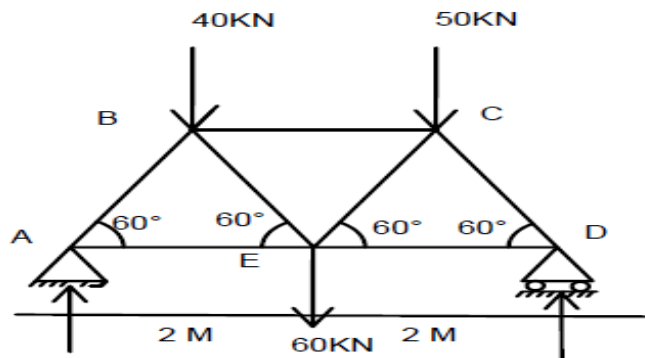
OR

6.   Determine the forces in all the members of truss shown in figure. Indicate the nature of   forces also.
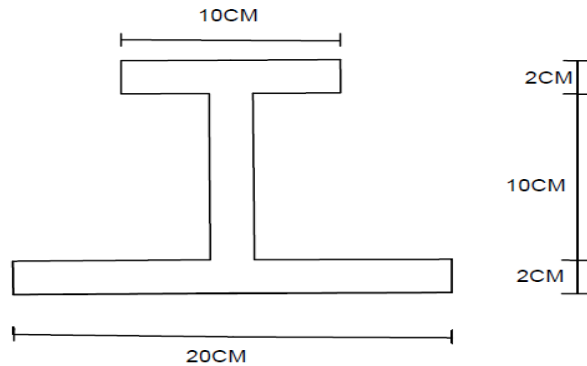
14M

UNIT IV

7. **State and prove parallel axis theorem.**   **14M**

<div align="center">

OR

</div>

8. **Find the moment of inertia of the section given below.**   **14M**

<div align="center">

UNIT V

</div>

9. **A bullet is fired upwards at an angle of 30° to the horizontal from a point P on a hill and it strikes a target which is 80m lower than B. The initial velocity of the bullet is 100 m/s. Calculate:**   **14 M**

(a) The maximum height to which bullet will rise above the horizontal;

(b) The actual velocity with which it will strike the target;

(c) The total time required for the flight of the bullet.

<div align="center">

OR

</div>

10. **An elevator weighing 5000 N is ascending with an acceleration of 3 m/s^2. During this ascent its operator whose weight is 700N is standing on scales placed on the floor. What is scale reading? What will be the total tension in the cables of the elevator during motion?**   **14M**

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, OCT/NOV 2019
Third Semester Examination
FLUID MECHANICS & HYDRAULIC MACHINERY

Time: 3 Hrs.   **Max Marks : 70**

Note : Answer any **FIVE** questions by choosing one from each unit.
All questions carry equal marks.

UNIT 1

1)   (a) Define specific weight, mass density, specific volume and specific gravity
     7M

     (b) At a point in a layer of glycerin of specific gravity 1.263, the shear stress is
     $0.1962N/m^2$ & velocity gradient is 0.25 S^{-1} .Calculate coefficient of dynamic viscosity
     and kinematic viscosity?
                                    7M

                                    OR

2.   (a) Define steady flow, unsteady flow, uniform flow, non-uniform flow and give   proper
     examples
     7M

     (b) When 2500 liters of water flows per minute through a 0.3m diameter pipe which later
     reduces to a 0.15m diameter pipe, calculate the velocities of flow in the two pipes.
     7M

UNIT 2

3.   (a) Define momentum principle and give expression for force exerted on a pipe   bend?
     7M

     (b) Oil of specific gravity 0.75 flows through a 15cm diameter pipe under a pressure of
     98.1 kN/m^2. If the datum is 3m below center of pipe and total energy with respect to
     datum is 20 N-m/N, calculate the discharge?

                                    OR

4.   (a) What do you understand by equivalent length of a pipe & give expression?
     7M

     (b) A pipe system consists of 3 pipes connected in series (1) 300m long, 15cm diameter
     (2) 150m long, 20cm diameter (3) 250m long, 20cm diameter. Determine the equivalent

length of 12.5cm diameter pipe
7M

UNIT 3

5.   (a) Obtain the expression for the force exerted by jet of water on a fixed flat plate inclined at an angle of "θ" to the jet?
            7M

        (b) A jet of water 75mm diameter having a velocity of 20m/sec strikes normally a flat smooth plate determine the thrust on the plate if the plate is at rest.
            7M

OR

6.   (a) What are different types of efficiencies of a turbine?
            7M

        (b) Explain the classification of turbines? Explain the working of pelton wheel turbine with a neat sketch?
            7M

UNIT 4

7.   (a) Explain briefly the principles on which a Kaplan turbine works?
7M

        (b) A Francis turbine working under a head of 5m at a speed of 210rpm develops 75kW when the rate of flow of water is $1.8m^3$/sec if the head is increased to16m, determine the speed, discharge and power?
7M

OR

8.   (a) Draw and discuss the operating characteristics of a centrifugal pump?
7M

        (b) Define a centrifugal pump. Explain the working of single stage centrifugal pump with neat sketches?
            7M

UNIT 5

9.   (a) Discuss various classifications of different types of hydropower plants?
            7M

        (b) Define the terms load factor, utilization factor, capacity factor and diversity factor?
            7M

OR

10.	(a) Define and derive an expression for specific speed of a pump. How does specific speed help in pump selection?
7M

(b) Describe various investigations required in connection with hydro power development? 7M

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B.Tech 3rd Semester Supple Examinations, 2019 – Model Paper
SURVEYING - I
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.

UNIT-1

1. a) Define surveying? Explain its classification?   (8m)
   b) Write a brief note about principles of surveying?   (6m)

(or)

2. a) A tape 20m long of standard length at 84°F was used to measure a line, the mean temperature during measurement being 65°. The measured distance was 882.10 meters, the following being the slopes: (6m)

$$2°10'\ \text{for 100m}$$
$$4°12'\ \text{for 150m}$$
$$1°6'\ \text{for 50m}$$
$$7°48'\ \text{for 200m}$$
$$3°0'\ \text{for 300m}$$
$$5°10'\ \text{for 82.10m}$$

Find the true length of the line if the coefficient of expansion is 65×10^{-7} per 1°F.

b) Explain any three methods for determining the distance between two inaccessible points, when there is an obstacle to both chaining and ranging?   (8m)

UNIT-2

3. a) What is meant by magnetic declination? Explain different variations in declination?   (7m)

   b) The following bearings were observed in running a closed traverse.

Line	F.B.	B.B.
AB	75°5′	254°20′
BC	115°20′	296°35′
CD	165°20′	345°35′
DE	224°50′	44°5′
EA	304°50′	125°5′

   At what stations do you suspect the local attraction? Determine the correct magnetic bearings.   (7m)

4. a) The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundaries of line: 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65 . Calculate the area enclosed between the survey line ,the irregular boundary line, and the first and last offsets, by the application of a)trapezoidal rule
   b) average ordinate rule
   c) Simpson's rule   (7m)

b)A railway embankment is 10m wide with side slopes 1½ to 1.Assuming the ground to be level in a direction transverse to the center line, calculate the volume contained in a length of 120meters ,the central heights at 20m intervals being in meters 2.2,,3.7,3.8,4.0,3.8,2.8,2.5.use prismoidal rule. (7m)

UNIT-3

5. a) The following staff reading were observed successively with a level .The instrument having been moved after third ,sixth and eighth readings 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 meters. Calculate the R.L of points if the first reading was taken with a staff held on a B.M of 432.384m (7m)
    b) Write a brief note about curvature & refraction (7m)

(or)

6. a) Explain different characteristics of contour with neat diagrams (6m)
    b) Explain any two indirect methods of locating contours (8m)

UNIT-4

7. a) Explain temporary adjustments in setting a theodolite (7m)
    b) Explain Repetition and reiteration methods of horizontal angle measurements (7m)

(or)

8. a) Explain any three methods for balancing the traverse (7m)
    b) Discuss different cases of omitted measurements (7m)

UNIT-5

9. a)Explain the two methods for determining the multiplying and additive constants (7m)
    b) A tachometer was set up at a station A and the readings on a vertically held staff at B were 2.255,2.605,and 2.955, the line of sight being at an inclination of $+8^0$ 24'. Another observation on the vertically held staff at B.M. gave the readings 1.640,1.920 and 2.200,the inclination of the line of sight being $+1^0$ 6'.Calculate the horizontal distance between A and B ,and the elevation of B if the R.L of B.M.is 418.685 meters .The constants of the instruments were 100 and 0.3. (7m)

(or)

10. a) Derive the distance and elevation formulae for an inclined line of sight with an angle of elevation and an angle of depression. (7m)
    b) Derive the distance and elevation formulae for staff normal to the line of sight. (7m)

K S R M College of Engineering (Autonomous), KADAPA – 516 003

B. Tech 3ʳᵈ Semester Regular Examinations, 2020 – Model Paper

Sub: BUILDING MATERIALS

(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Note: Answer any FIVE Questions choosing One Question from each Unit

UNIT-I

1. Explain briefly about classification of Rocks?   (14M)

(OR)

2. Describe briefly about manufacture of bricks?   (14M)

UNIT-II

3. Explain briefly about manufacturing of cement?   (14M)

(OR)

4. (a) Explain about ingredients of concrete and elements used in R.C.C   (7M)

(b) Write the uses and properties of mortar?   (7M)

UNIT-III

5. (a) Write the properties of steel?   (7M)

(b) Write short notes on:

   i) fiber reinforced concrete   ii) Light weight concrete?   (7M)

(OR)

6. (a) Explain about High performance concrete and High strength concrete?   (7M)

(b) Write the applications of steel and aluminium?   (7M)

UNIT-IV

7. (a) Explain briefly about the types of paints and its defects?   (7M)

(b) Explain briefly about elements and properties of varnishes?   (7M)

(OR)

8. (a) Explain briefly about constituents and composition of glass?   (7M)

(b) Write the properties of glass and plastic?   (7M)

UNIT-V

9. (a) Explain briefly about Reactive powder concrete and Geopolymer concrete?   (7M)

(b) Explain briefly about Blended cement concrete and its properties?   (7M)

(OR)

10 (a) Explain briefly about Ready mixed concrete and its advantages?   (7M)

(b) Write short notes on

   i) Ceramic tiles ii) vitrified tiles   iii) wooden tiles   iv) flooring tiles   (7M)

Code No: 1501305

Time: 03:00 Hrs.   Max. Marks: 70

Note: 1. Answer FIVE questions, choosing ONE question from each UNIT
         2. ALL questions carry EQUAL marks

UNIT – I

1 (a)   Define specific weight, mass density, specific volume and specific gravity.

   (b)   Define surface tension. Derive expression for the pressure within a droplet of water

(OR)

2 (a)   What do you understand by hydrostatic law?

   (b)   A circular plate of 0.3m diameter is immersed in water of an inclination 60° to the free surface with its top edge at 1M below the water surface. Find the total pressure and centre or pressure on the plate

UNIT – II

3 (a)   What are the methods of describing fluid flow?

   (b)   Define the equation of continuity. Obtain an expression for the continuity equation for a three dimensional flow?

(OR)

4 (a)   Define the terms velocity potential and stream function?

   (b)   The stream function for a two dimensional flow is given by $\Psi=8xy$. Calculate the velocity at the point Q(4, 5). Find the velocity potential?

UNIT - III

5 (a)   What is hydrodynamics? What are the forces that are considered in solving the problems on hydrodynamics?

   (b)   State and prove Bernoulli's theorem of flow liquids.

(OR)

6   Water under pressure of $3.924 \times 10^{-3} N/m^{2}$ is flowing through a 0.3m pipe at the rate of 0.25cumecs. If the pipe is bent by 135°, Find the magnitude and direction of the resultant force on the bent.

UNIT – IV

7   Derive the Hagen – Poiseuille equation stating the assumptions made

<div align="center">(OR)</div>

8 (a) What is meant by turbulence? How does if effect the flow properties?

   (b) What are major & minor losses? Derive expression for loss of head due to sudden expansion.

<div align="center">UNIT - V</div>

9   What do you understand by the term boundary layer? Describe with reference to flow over a flat plate

<div align="center">(OR)</div>

10   Explain clearly the phenomenon of boundary layer separation and how it can be prevented.

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B.Tech 3ʳᵈ Semester Regular Examinations, 2019 – Model Paper
Sub: ENGINEERING GEOLOGY
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any FIVE Questions choosing One Question from each Unit
All questions carry Equal Marks
UNIT-1

1. (a). Define Geology? Describe various branches of Geology in Civil Engineering field   7m
   (b). Discuss in detail the Importance of Engineering Geology in Civil Engineering   7 m
Or
2. Define Weathering? Explain in detail Chemical weathering with reference Dams   14 m

UNIT-II

3. (a) Define a Mineral? Describe in detail their properties of Quartz and Feldspar?   7 m
   (b) Define Luster, Fracture, and Structures with their suitable examples?   7 m
Or
4. (a) Discuss in detail the properties of   (i) Bauxite   (ii) Mica   7 m
   (b) Explain in briefly Clay Minerals?   7 m

UNIT-III

5. (a) Explain in details structures of Igneous Rocks?   7 m

   (b) What do you understand Rock Cycle? Explain various Metamorphism processes?   7 m
Or
6. (a) Describe the following Rocks are given their properties   7 m
      (i)   Basalt   (ii)   Marble
   (b) Describe the structures of Sedimentary Rocks?   7 m

UNIT-IV

7. (a) What is the Classification of Folds?   7 m
   (b) Define the following..,
   (i) Normal Fault-Reverse Fault   (ii) Strike-Dip
   (iii) Columnar-Sheet Joints   (iv) Recumbent Fold   7 m

Or

8. What is a Un-Conformity? Explain in details?   14 m

UNIT-V

9. What are the Landslides and how they are classified? What are the factors responsible
   for the Causes ofLandslides?   14 m
Or
10. (a) What are the Geographical Methods   4 m
    (b) Explain detail of Electrical Resistivity Metho   d   10 m

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, OCT/NOV 2019
Third Semester Examination
Sub: Electromagnetic Fields

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
      All questions carry equal marks.

UNIT I

1. a) State and explain coulomb's law.
   b) Calculate the force on a unit positive charge at P (2, 0)m due to the charges Q_1 at origin and Q_2 at (1, 0). Where Q_1 = 1000 PC, Q_2 = - 2000 PC.

(OR)

2. a) What is an Electric Dipole and derive an expression for the Potential (V) and Electric Field Intensity ($\bar{E}$) at any point in free space due to Dipole.
   b) Derive Maxwell's First Equation $\nabla.\bar{D} = \rho_v$.

UNIT II

3. a) State Equation of Continuity and derive the expression in Point form and Integral form.
   b) Given $\bar{J} = 100sin\theta\ \overline{a_r}\ A/m^2$ in Spherical Coordinates, find the current crossing the Spherical Shell at r = 0.02m.

(OR)

4. a) Derive the boundary conditions for $\bar{E}$ and $\bar{D}$ at the boundary between two perfect dielectrics.
   b) A capacitor with a dielectric of ϵ_r = 5 has a plate separation of 4mm and plate area of $64cm^2$. A voltage of 200V is applied between the plates. Determine the surface charge density and energy stored in the capacitor.

UNIT III

5. a) Determine **B** due to a straight conductor of length Lm and steady current I Amps at a distance of R m from the centre of line current.
   b) If the magnetic field intensity is $\bar{H} = x^2\overline{a_x} + 2yz\overline{a_y} + (-x^2)\overline{a_z}\ A/m$.

   Find the current density at point
   (a)   2, 3, 4
   (b) ρ = 6, φ = 45^0, z = 3

(c) $r = 3.6$, $\Theta = 60^0$, $\varphi = 90^0$

(OR)

6. a) Derive expression for vector magnetic potential 'A' which satisfies the vector Poisson's equation

b) Given $\vec{A} = x^2\, y\, a_x + y^2 x\, a_y - 4xyz\, a_z$ wb/m. Find B at (-1, 2, 5) and Calculate the flux through the surface defined by Z=1, $0 \le x \le 1$, $-1 \le y \le 4$.

UNIT IV

7. a) Derive Lorentz Force Equation. Obtain the expression for the force experienced by a conductor placed in magnetic fields.

b) Calculate the force on a straight conductor of length 30cm carrying a current of 5A in $\overline{a_z}$ direction and the magnetic field is $\bar{B} = 3.5x10^3 (\overline{a_x} - \overline{a_y})Tesla$. Where $\overline{a_x}$ and $\overline{a_y}$ are unit vectors

(OR)

8. a) Derive formulae for self inductance of a solenoid. Use this formulae, find self inductance of a solenoid having 500 turns, mean diameter equal to 10cm and length equal to 5cm. Assume medium to be air.

b) What is the torque experienced by a closed circuit carrying a current of I amps and placed in a uniform magnetic field B-Tesla.

UNIT V

9. a) Explain Faraday's Law of Electromagnetic Induction and derive Maxwell's equation in Integral and Differential Form.

b) Find the displacement current density within a Parallel Plate Capacitor where ϵ =100ϵ_0, a = 0.01m², d=0.05mm and the capacitor voltage is 100sin200πt volts.

(OR)

10. a) Write down Maxwell's equations in differential form and hence obtain the corresponding equations in integral form.

b) A conductor of length 100cm moves at right angles to a uniform field of strength 10,000 lines/cm², with a velocity of 50m/sec. Calculate the EMF induced in it. Find also the value of the induced EMF when the conductor moves at an angle of 30^0 to the direction of the field.

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K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA
B.Tech. III Semester (R15)
(Common for EEE & ECE)
Model Paper
Subject: NETWORK THEORY

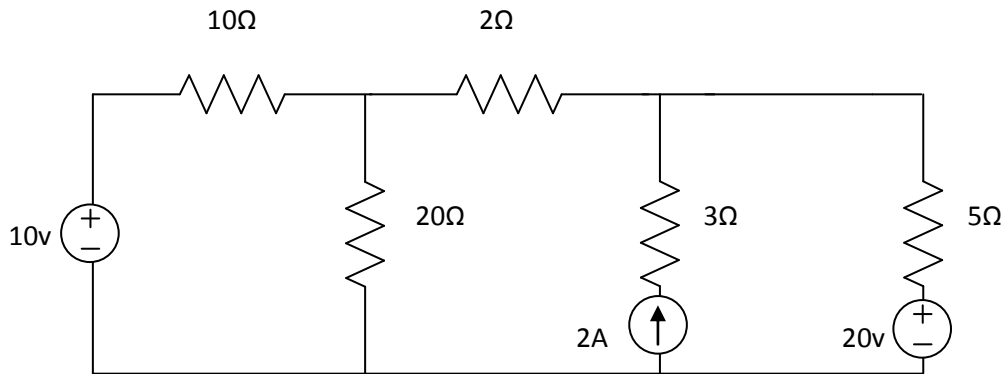Time: 3 Hours   Max. Marks: 70

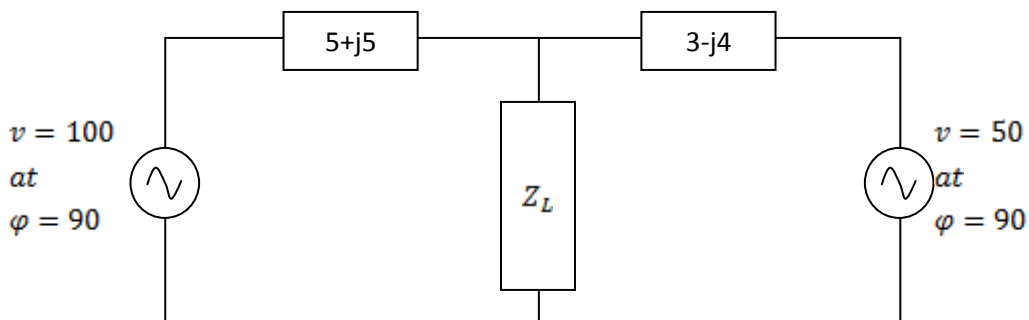Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks.

UNIT-I

1. (a) State the maximum power transfer theorem & its limitations
   (b) Find the voltage across the 2Ω resistor by using super position theorem.

(OR)

2. (a) State Reciprocity theorem.
   (b) Find the maximum power transferred to the load Z_L for the network shown below

UNIT-II

3. (a) Derive the relation between phase & line values of a 3 phase star connected balanced system
   (b) Three impedances each of (3-j4)Ω are connected in delta to a 230v, 3-φ, 50Hz balanced supply. Calculate the lines and phase currents in delta connected load

and the power delivered to the load.

(OR)

4. A balanced 3-φ ,three wire ,50Hz,100v supply is given to a load consisting of 3-impedances (1+j1)Ω,(1+j2)Ω and (3+j4)Ω connected in star. Compute the voltages across and current in three phases of the load using loop current method.

UNIT-III

5. (a) Derive the expression for i(t) when RC Series Circuit is Excited by a DC Voltage 'V' applied at t=0
    (b) A Series RL Circuit with R=30Ω & L=15H has a Constant voltage V=60 is applied at t=0 as shown in the figure. Determine the current and the voltage across the resistor and inductɪ
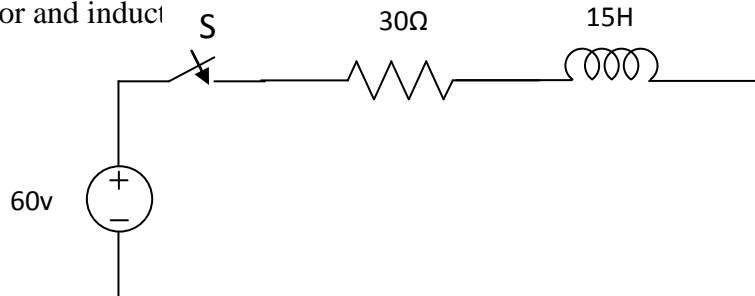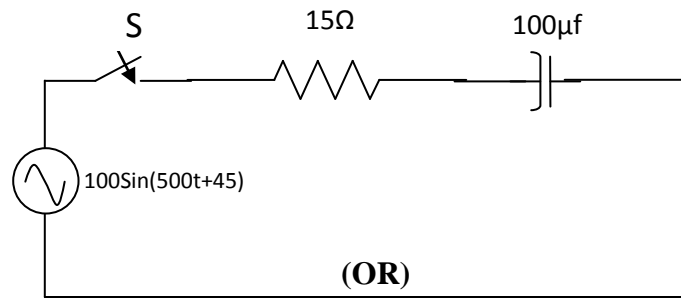

(OR)

6. Find the expression for current i(50Ω ɪ the switch '1' is closed at t=0 and switch '2' is closed at 4m Sec.
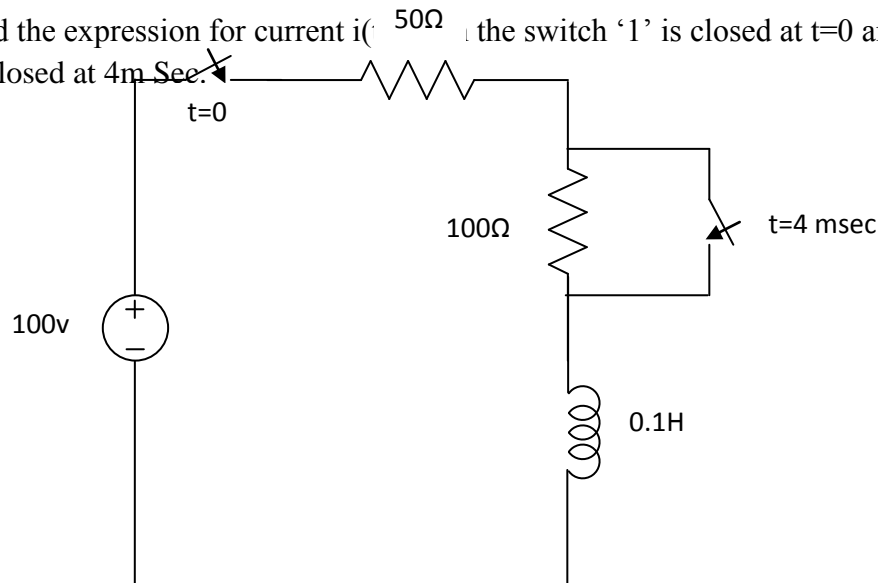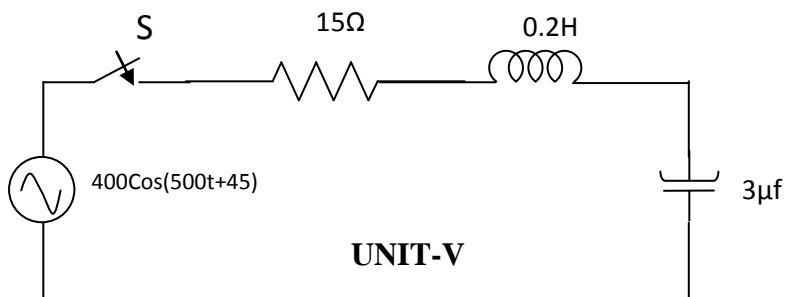

UNIT-IV

7. (a) Derive the expression for i(t) for RL series Circuit when by a Sinusoidal source using Laplace transform.
    (b) The circuit shown in the figure. consists of series RC element. Obtain the current
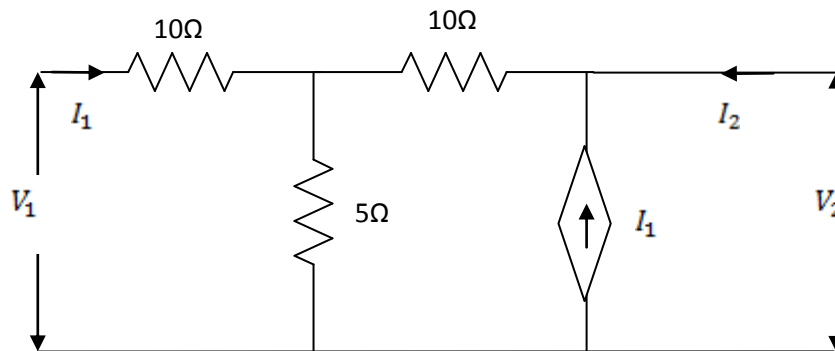
transient.

(OR)

8. In the circuit shown in the figure .determine the complete solution for the current when the switch is closed at t=0.

UNIT-V

9. (a) State and explain ABCD parameters

(b) Determine the Z-Parameters of the network shown in the figure.

(OR)

10. Determine the expression for ABCD parameters of the resulting network when two networks are cascaded.

Code:1502306

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, OCT/NOV 2019
Third Semester Examination
SUB: Electrical Machines – I

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
    All questions carry equal marks.

UNIT-I
1. (a) Derive the EMF equation of DC-Generator?
   (b) Draw the developed winding diagram of progressive lap winding for   4-Poles, 16-slots with two coil sides per slot, double layer showing there in position of the poles, direction of motion, direction of induced emf's and position of brushes?

OR
2. (a) How are the de-magnetizing and Cross-magnetizing ampere-Turns/pole in DC-Machines are calculated?
   (b) A 500V, wave-wound 750rpm shunt generator supplies a load current of 195A.The armature has 720 conductors and shunt field resistance is 100Ω. Find the de-magnetizing ampere-Turns/pole, if the brushes are advanced through 3 segments at this load. Also calculate the extra shunt field turns required to neutralize this demagnetization.

UNIT-II
3. (a) Explain the procedure to obtain 0.C.C of a DC-Shunt Generator?
   (b) The armature of a 4-pole lap wound shunt generator has 120 slots with 4-conductors per slot. The useful flux per pole is 0.05wb. the armature resistance is 0.05Ω and the shunt field resistance is 50Ω. Find the speed of the machine when applying 450A at a terminal voltage of 250V.

OR
4. (a) What are the reasons for failure of self excited shunt generator to build up voltage?
   (b) The following data pertains to the magnetization curve of a DC-shunt generator at 300rpm.

I_F in Amps:	0	0.2	0.3	0.4	0.5	0.6	0.7	0.8
E_G in Volts:	7.5	93	135	165	186	202	215	230

the field resistance of the machine is adjusted to 354.5Ω and the speed is 300rpm for this generator,
    (i) Determine the no load generated voltage
    (ii) Determine the critical value of the shunt field resistance

(iii) Determine the critical speed for the given shunt field resistance.

UNIT-III

5. (a) Describe the internal and external characteristics of DC-Shunt generator?

   (b) The 220V, DC-Generator, each having linear external characteristics,
       operate in parallel. One machine has a terminal voltage of 270V on
       No-Load and 220V at a load current of 35A, while the other has a
       voltage of 280V at no-load and 220V at 50A. Calculate
        (i)the output current of each machine and the bus bar voltage when the total load is
           60A.
        (ii) What is the KW output of each machine under this condition?

OR

6. (a) What is the necessity for parallel operation of generators? Explain the
       requirements of paralleling of DC-Generator?

   (b) The two shunt generators are operating in parallel. The emf induced in one machine
       is 210V and that induced in other machine is 220V. The supply together a load
       current of 4000A. If each machine has an armature resistance of 0.01Ω and field
       resistance of 20Ω, determine
        (i) terminal voltage   (ii) output of each machine.

UNIT-IV

7. (a) Describe with neat sketches the principle of operation of DC-Motors?

   (b) A 4-pole, 220V shunt motor has 540 lap-wound conductors. It takes 32A from the
       supply mains and develops output power of 5.595KW. The field winding takes 1A.
       The armature resistance is 0.09Ω and the flux per pole is 30mwb. Calculate:
        (i) the speed   (ii) the torque developed in Newton-metre.

OR

8. Briefly explain different speed control methods in DC-Shunt Motors?

UNIT-V

9. (a) Explain about different losses in DC-Machines?

   (b) In a brake test on a small shunt motor the speed was 1500rpm the load on one side of
       the brake band was 28.9N and on the other 1.67N. The diameter of the brake pulley
       was 15.2cm. If the input current was 2A at 250V, calculate:
        (i) the output torque   (ii) efficiency   (iii) the brake horse power.

OR

10. Explain the process of Hopkinson's test with neat sketches?

Code: (1503301)

K.S.R.M COLLEGE OF ENGINEERING, KADAPA
III SEMESTER MECHANICAL ENGINEERING
Model paper

SUB: ENGINEERING MECHANICS (1503301)

Time:3 hours   Max Marks: 70

Answer any five questions choosing one question from each unit
All questions carry equal marks

UNIT I

1. a) State and explain Varignon' theorem   (4 Marks)
b) The forces 20N, 30N, 40N, 50N and 60N are acting on one of the angular points of a regular hexagon, towards other five angular points taken in order (Figure 1). Find the magnitude and direction of resultant force
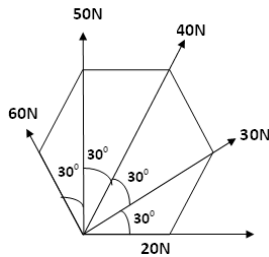

Figure 1   (10 Marks)

OR

2. a) Explain free body diagram with one example   (4 Marks)
b) Two smooth spheres each of radius 100mm and weighing 100 N rest in a horizontal channel having vertical walls ,the distance between which is 360 mm. Find the reactions at the point of contacts A,B,C and D as shown in the Figure 2. o_1 and o_2 are centres of spheres 1 and 2 respectively

Figure 2   (10 Marks)
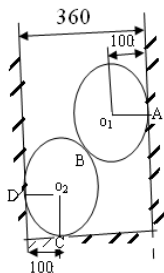

UNIT II

3. a) state the laws of friction   (4 Marks)

b) A body of weight 500 Newtons is lying on a rough plane inclined at an angle of 25^0 with the horizontal. It s supported by an effort (P) parallel to the plane as shown in the Figure 3.
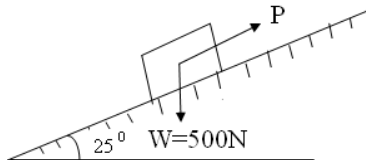

Figure 3

Determine the minimum and maximum value of P, for which the equilibrium can exist, if the angle of friction is 20^0 (10 Marks)

OR

4 a) State clearly the difference between a perfect frame and an imperfect frame   (4 Marks)

b) Figure4 shows a warren girder consisting of seven members each of 3 m length freely supported at its end points.
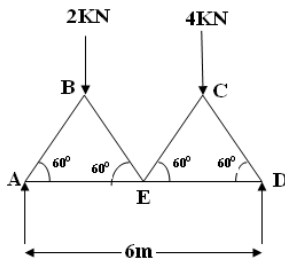

Figure 4

The girder is loaded at B and C as shown in the Figure4. Find the forces in all the members of the girder, indicating whether the force is compressive or tensile.   (10 Marks)

UNIT III

5. a) Determine centre of gravity of solid hemisphere of radius r from the base from basic principle.   (4 Marks)

b) Determine the coordinates x_c and y_c of the centre of 100mm diameter circular hole cut in a thin plate so that this point will be the centroid of the shaded area shown in the Figure5 .All dimensions are in mm.
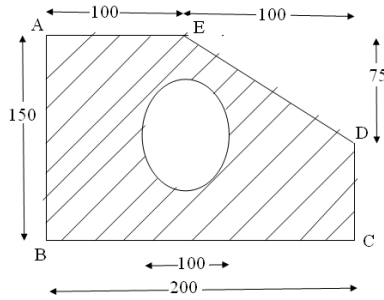
Figure 5   (10 Marks)

OR

6a) Find the centroid of the triangle whose height is h and base is b from basic principle.   (4 Marks)

b) A solid body is formed by joining the base of right circular cone of height H to the equal base of a right circular cylinder of height h as shown in the Figure 6. Calculate the distance of centre of the mass of the solid from its plane face when H= 12 cm and h= 3cm.

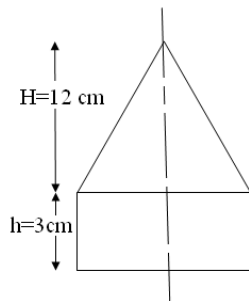Figure 6   (10 Marks)

UNIT 1V

7. a) Derive an equation for moment of inertia of circular section about centroidal axis (4 Marks)

b) Find the moment of inertia of area of a T section shown in the Figure7 about XX and YY axes through the centre of gravity of the section. (All dimensions are in mm)
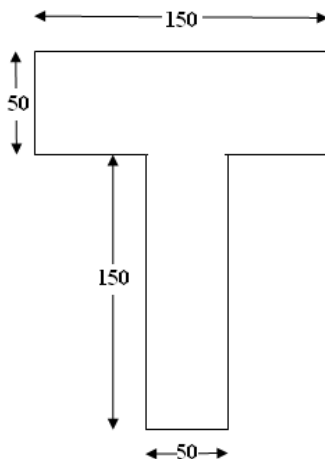
Figure 7 (10 Marks)

OR

8.a)State and prove the theorem of perpendicular axis as applied to moment of inertia (4Marks)

b) Determine mass moment of inertia of a steel rectangular plate 8cm x16cm x 1cm thickness as shown in the Figure 8 about centroidal axis parallel to 8cm side. Take mss density of steel as 8000 kgs/m^3.
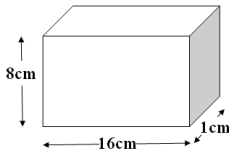

Figure 8 (10Marks)

UNIT V

9a) A force of 200 N acts on a body of mass 500kgs initially at rest. Find the velocity of the body after the force has been acting for 5 seconds. Also find the distance through which the body will travel in 5 seconds. (Marks 7)

b) An elevator weights 2500 kg-weight and is moving vertically downwards with a constant acceleration starting from rest it travels a distance of 35 m during an interval of 10 seconds. Find the cable tension during this time. Neglecting all other resistances to motion, what are the limits of cable tension? (Marks 7)

OR

10.a) A wheel increases its speed from 45 r.p.m to 90 r.p.m in 30 seconds . Find
  I. Angular acceleration of the wheel
  II. Number of revolutions made by the wheel in these 30 seconds.
     (Marks 7)

b) A flywheel weighing 50KN and having radius of gyration 1metre loses its speed from 400r.p.m to 280 r.p.m in 2 minutes. Calculate
  I. The retarding torque act on it
  II. Change in kinetic energy during the above period (Marks 7)

Code: 1503304

K.S.R.M COLLEGE OF ENGENEERING, KADAPA (AUTONOMOUS)

B.Tech III semester (R15) Supple. Examinations, October/November -2019

SUB: **MATERIAL SCIENCE AND METALLURGY**

Dept: MECHANICAL ENGINEERING DEPARTEMENT

MODEAL QUESTION PAPER

Time: 3hrs   Max Marks: 70

Note: Answer five questions. Selecting one Question from each unit

All Questions carry equal marks.

Unit-I

1. a) Briefly Explain about Mechanism of crystallization of metals with neat Sketch

    b) Define Grain Size, and list out the Methods to Determine Grain Size Recommended by the ASTM. Explain any one method

OR

2   a) Define solid solutions? List out the types of solid solutions. Explain Substitutional solid Solution

    b) State and Explain Hume Ruther's rules.

Unit-II

3. a) Briefly explain about Phase rule and Lever rule?
    b) Discuss different types of Phase diagrams in binary alloy systems.

OR

4.   Explain Iron-Iron carbon equilibrium diagrams with neat sketch and explain The effect of alloying elements on Iron-Iron carbon equilibrium diagram.

Unit-III

5. List out the Basic types of Cast iron materials. Explain properties, applications and micro structure of Malleable Cast Iron with neat Sketch

OR

6. Briefly Explain The Classifications of the Steels, Explain properties, applications and micro Structure   and Applications of Plain Carbon Steel with neat Sketch

Unit-IV

7.   Draw and explain Isothermal-Transformation diagram for An Eutectoid steels. With neat Sketch

OR

8.   Define Heat Treatment? Classify the various stages of Heat Treatment process, and Explain Any one of the   Heat Treatment process with neat sketch.

Unit-V

9. Write about the Compositions, Properties and Applications of "Copper and its Alloys"

OR

10. Write about the Compositions, Properties and Applications of "Aluminum and its Alloys"

Code: 1503305
K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
III semester (R15) Supple Examinations
THERMODYNAMICS
(Mechanical Engineering)
MODEL QUESTION PAPER

Time:3 hrs **Max Marks: 70**

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

Unit-I

1 (a)What is thermodynamic system ? What is the difference between a closed system and an open system ? Give a few examples for closed and open systems.

b) An engine cylinder has a piston of area $0.12 m^2$ and contains gas at a pressure of 1.5 MPa. The gas expands according to a process which is represented by a straight line of a pressure-volume diagram. The final pressure is 0.15MPa. Calculate the work done by the gas on the piston if the stroke is 0.03m.

OR

2. A fluid contained in a horizontal cylinder fitted with frictionless leak proof piston,is continuously agitated by means of a stirrer passing through the cylinder cover.The cylinder diameter is 0.4m. During the stirring process lasting 10minutes, the piston slowly moves out a distance of 0.485m against the atmosphere. The network done by the fluid during the process is 2KJ. The speed of the electric motor driving the stirrer is 840rpm. Determine torque in shaft and power output of the motor.

Unit-II

3. a) Derive the expression for heat transfer in the polytropic process ?

b) 0.44kg of air at $180^0 C$ expands adiabatically to three times its original value and during the process; there is a fall in temperature to $15^0 C$. The work done during the process is 52.5 kJ/kg. Calculate C_p and C_v

OR

4. a) Make a comprehensive energy analysis of the steam turbine.

b) The gas leaving the turbine jet engine flows steadily into the jet pipe with enthalpy 960 kJ/kg and velocity 250 m/s. The exit from the pipe is in line with intake. Neglecting heat loss from the system, determine the velocity of gas leaving the pipe.

Unit-III

5. a) State and explain the second law of thermodynamics.

b) A heat engine receives heat at the rate of 1500kJ/min and gives an output of 8.2 KW. Determine (i) the thermal efficiency (ii) the rate of heat rejection

OR

6. a) Define Clausius inequality and prove it.

b) An engine operating on a Carnot cycle works with in temperature limits of 600 K and 300 K. If the engine receives 2000 kJ of heat, evaluate the work done and thermal efficiency of the engine.

Unit-IV

7. a) Define dryness fraction and explain any one method of measuring it.

b) Steam enters an engine at 12 bar and 67^0C of superheat. It is exhausted at a pressure of 0.15 bar and 0.95 dry. Find the drop in enthalpy of the steam.

OR

8. Write the various forms of Tds equations and hence prove Tds=$\frac{Cp}{\beta v}dv + C_v\frac{k}{\beta}dp$.

Unit-V

9. a) The specific heats of a gas are given by $C_p = a+kT$ and $c_v = b+kT$, where a,b and k are constants and T is in K. Show that for an isentropic expansion of this gas,$T^b v^{a-b} e^{kT} = $ constant

b) 1.5 kg of this gas occupying a volume of 0.06 m^3 at 5.6 MPa expands isentropically until the temperature is 240^0C. If a =0.946, b = 0.662 and k =10^{-4} .Calculate the work done in the expansion.

OR

10. a) Derive an expression for an air standard efficiency of otto cycle.

b) Compute the changes in efficiencies of an otto cycle when the compression ratio changes from 4 to 5. Take $\gamma=1.4$.

Code: 1503306

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
III semester (R15) Regular Examinations
MACHINE DRAWING
(Mechanical Engineering)
MODEL QUESTION PAPER

Time: 4 hrs   **Max Marks: 70**

All Answers should be on the drawing sheet only
Answers on the drawing sheet only will be valued

Section -I
(Answer any two questions,2X4 = 8 Marks)

1. Sketch the conventional representation of the following
   a) External threads. b) Bearing. c) compression spring

2. Sketch the conventional representation of the following
   a) Wood b) Diamond knurling   c) oil

3. Sketch the following thread profiles for a pitch of 25mm
   a) whit worth thread b) worm thread

Section -II
(Answer any two questions,2X10= 20 Marks)

4. Draw sectional view from the front and the view from the above of double
   Riveted zigzag lap joint to join plates of thickness 9 mm

5. Draw the view from the front and view from the side of a flanged coupling to connect two shafts each of diameter 30 mm.

6. Draw the two views of a hexagonal headed bolt of nominal diameter 25 mm and length 100mm with a hexagonal nut and washer.

Section- III
(Compulsory question, 1X42 = 42 Marks)

7. Assemble the parts of the screw jack ,shown in figure 1and Draw the following views (i) Half sectional view from the front and (ii) view from above

Code: 1503306
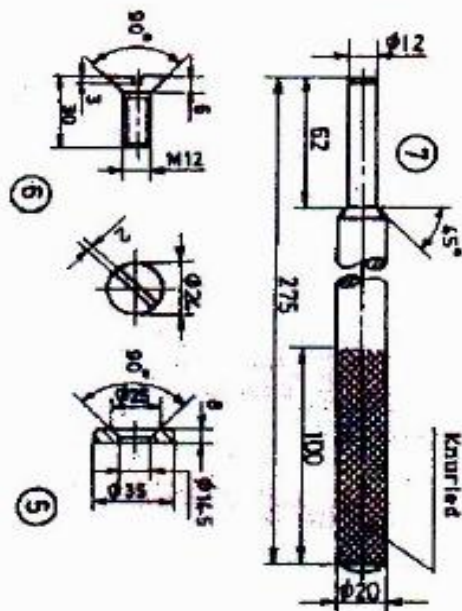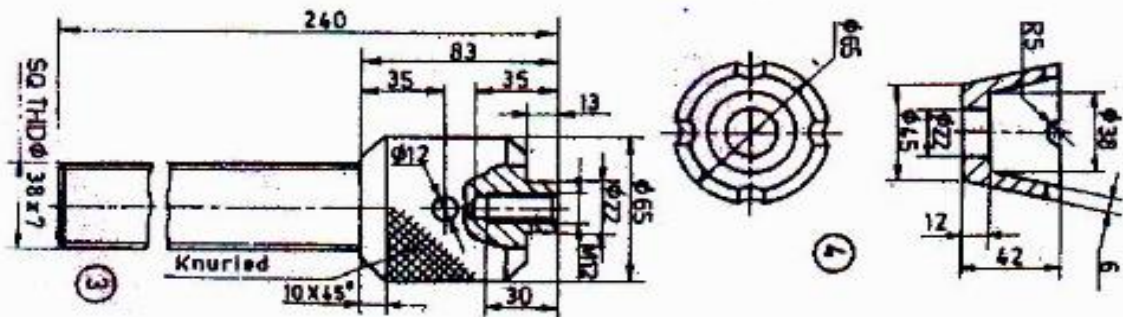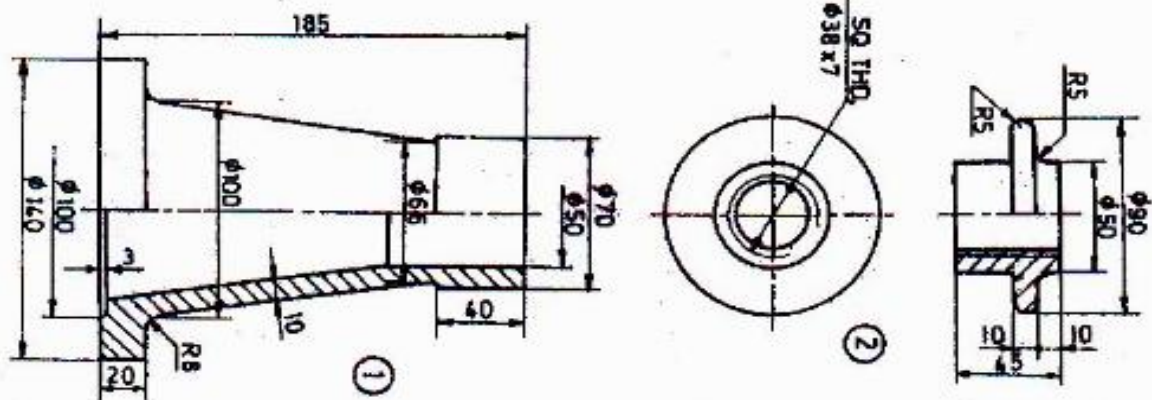
Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

*****

K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA
B.Tech. III Semester (R15)
Branch: ECE
Model Paper
Subject: ELECTROMAGNETIC FIELDS

Time: 3 Hours   Max. Marks: 70

Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks

UNIT-I

(a) Explain Coulomb's law in detail and derive the expression for Electric field   intensity **E**?

(b) Point charges 1mc and -2mc are located at (3, 2,-1) and (-1,-1, 4) respectively. Calculate the electric force on a 10nc charge at (0,3,1) and the Electric field intensity **E** at that point.

(OR)

1. (a) Define Gauss's law and derive the expression for electric field intensity E for uniformly charged sphere by applying Gauss's law?

(b) A finite sheet $0<x<1$, $0<y<1$ on z=0 plane has a charge density $\rho_s = xy(x^2+y^2+25)^{3/2}$ nc/m^2 find

   (i) The total charge on the sheet
   (ii) The electric field at a point P (0, 0, 5)

UNIT-II

3. (a) Derive the expressions for potential V and electric field intensity **E** of a dipole?

(b) Given the potential $V=2x^2y-5z$ and a point P(-4,3,6), find

   (i) V, **E** at point P
   (ii) Electric flux density **D** and volume charge density ρ_v

(OR)

4. (a) Obtain the expression for energy density of electrostatic field?

(b) Derive the relation between electric potential V and electric field intensity **E**?

UNIT-III

5. (a) Derive the expressions for continuity equation and relaxation time?

(b) Derive the expression for capacitance of a spherical capacitor?

(OR)

6. (a) Dereive the Poisson's and Laplace's equtions and Explain the general procedure for solving them?

(b) State and prove the Uniqueness theorem?

UNIT-IV

7. (a) State Biot-savart's law and derive the expression for magnetic field intensity H at a

point P due to finite length current carrying conductor?

(b) The positive y-axis (semi infinite line with respect to origin) carries a filamentary current of 2A in the **-a$_y$** direction. Assume it is a part of a large circuit. Find **H** at point P (2, 3, 0).

(OR)

8. (a) State Ampere's circuital law and derive the expression for magnetic field intensity of infinite long coaxial transmission line?

(b) Derive the Maxwell's two equations for magneto static fields.

UNIT-V

9. (a) What is the inconsistency of Ampere's law and explain the concept of displacement current?

(b) A parallel plate capacitor with plate area of 5cm^2 and plate separation of 3mm has a voltage 50 sin10^{3}t V applied to its plates. Calculate the displacement current assuming $\varepsilon = 2\varepsilon_0$?

(OR)

10. (a) Give the Maxwell's equations in point form and integral form along with word statements?

(b) Derive the boundary conditions for Dielectric-Dielectric case?

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, OCTOBER/NOVEMBER 2019
Third Semester Examination
Sub: Electronic Devices & Circuits
(Common to EEE & ECE Branches)

Time: 3 Hrs.   Max Marks : 70

Note :   Answer any **FIVE** questions by choosing **one** from each unit.
       All questions carry equal marks.

UNIT-1

1. (a) Discuss P-N Diode V-I characteristics with neat sketch.   (7M)
   (b)Discuss Zener and avalanche break down mechanisms.   (7 M)

(OR)

2. (a) Derive an expression for Drift and Diffusion currents in P-N Junction Diode.   (7M)
   (b) Differentiate insulators ,metal and semiconductors   (7M)

UNIT-II

3. (a) With circuit and necessary wave forms explain the operation of Centred
       tapped Full wave Rectifier.   (7M)
   (b) The load resistance of centre tapped full wave rectifier is 500 ohms and the necessary voltage is 60sin(100πt). Calculate i) peak, average and rms values of current ii) ripple factor and iii) efficiency of the rectifier . each diode has an idealized v-I characteristics having slope corresponding to a resistance of 50ohms
                                                                                  (7M)

(OR)

4. (a) With circuit and necessary wave forms explain the operation of HWR with capacitor filter (7M)
   (b) Explain the operation of bridge rectifier and derive the expression for TUF.   (7M)

UNIT-III

5. (a). Explain the operation of NPN &PNP Transistors.   (7M)
   (b). Define α,β,γ .Derive the Relationship between α,β,γ of the Transistor.   (7M)

(OR)

6. (a).Explain input and output characteristics of Common Emitter
       Configuration with neat diagram.   (10M)
   (b). Discuss in detail about early effect and its consequences.   (4M)

UNIT-IV

7. With the help of neat sketches and characteristics curve explain the Operation of the Junction FET(14M)

(OR)

8. With neat structure explain the principle of operation of enhancement MOSFET.   (14M)

UNIT-V

9 (a) What is meant by Q-point? What is the need for biasing a Transistor? (7M)

(b)Define Stability factor 'S'. Derive an expression for stability factor 'S' in
   Self-biasing a Transistor? (7M)

(OR)

10.Discuss the principle of operation and V-I characteristics of (7M)

(a). Photo diode

(b) Uni Junction Transistor.

Subject Code: 1504304

K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA
B.Tech. III Semester (R15)
Branch: ECE
Model Paper
Subject: SIGNALS & SYSTEMS

Time: 3 Hours   Max. Marks: 70

Answer any five questions, choosing **ONE** question from each unit.
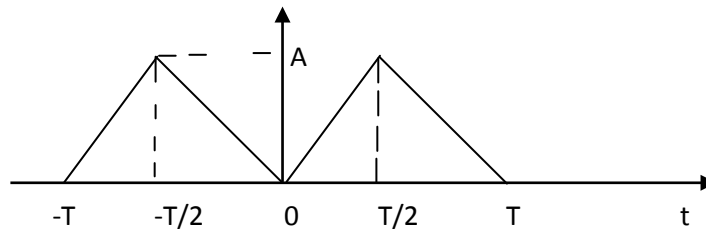All questions carry equal marks.

UNIT-I

1. (a) Define and sketch the following elementary signals   (8)

    (i)Unit impulse signal (ii)Unit step signal (iii)Unit ramp signal (iv)Signum function.

   (b) Explain the different classifications of the signals.   (6)

(OR)

2. (a) Determine the Fourier series of the signal shown in figure below figure   (8)

   (b) Explain Dirichlet's conditions for the convergence of Fourier series.   (6)

UNIT-II

3. State and prove any five properties of Fourier Transform   (14)

(OR)

4. (a) Obtain the Fourier transform of the following functions: (7)
       i. Impulse function δ(t)
       ii. DC Signal
       iii. Unit step function.
   (b)   Explain the Fourier transform of periodic signals.   (7)

UNIT-III

5. (a) Explain how input and output signals are related to impulse response of a LTI system   (7)
   (b) Explain the conditions for Distortion less transmission through LTI system.   (7)

(OR)

6. Explain the process of sampling in detail with neat sketches   (14)

UNIT-IV

7. (a) Explain the Linear Shift Invariant (LSI) system and its response.   (7)

   (b)Write short notes on linear constant coefficient difference equations.   (7)

(OR)

8. (a) Define discrete time Fourier transforms and explain the conditions for its convergence.   (7)

   (b) State and prove the time shifting and convolution properties of DTFT.   (7)

UNIT-V

9. (a) Define Laplace Transform and State the properties of the ROC of Laplace Transforms   (7)
   (b) Find the Laplace transform of $x(t) = e^{-t} \cos(\omega t) u(t)$ and mention its ROC.

(OR)

10. (a) If $X(s) = \dfrac{s+3}{(s+1)(s+2)}$ find its inverse Laplace transform .   (7)

    (b) State and prove initial value and final value theorems.   (7)

Code:(1511302)

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)

III semester (R15) Supple Examinations

MECHANICS OF SOLIDS (1511302)

Mechanical Engineering MODEL QUESTION PAPER

Time:3 hours   Max Marks: 70

Answer any five questions choosing one question from each unit

All questions carry equal marks

UNIT I

1. a) Derive the relationship between the elastic moduli.   (8 marks)

    b) A reinforced short concrete column 250mm X 250mm in section is reinforced with 8 steel bars in 2500 mm^2. The column carries a load of 390KN. If the modulus of elasticity for steel is 15 times that of concrete. Find the stresses in steel and concrete
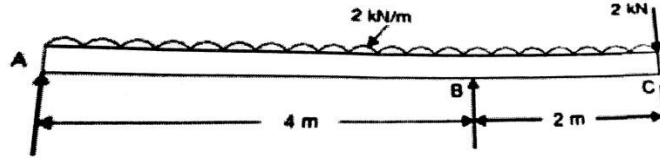   (6 marks)

OR

2. a)   Derive   a   relation   between   stress   and   strain   of   elastic   body
        (7marks)

    b) A brass bar having cross sectional area of 1000 mm^2 is subjected to axial forces as shown in fig. Find the total elongation of the bar, Take E=1.05×10^5 N/mm^2 (7 marks)
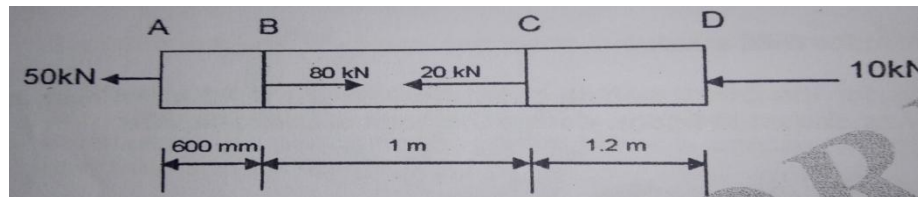
UNIT II

3. a) what are the different types of beams. Differentiate between a point load and uniformly distributed load.   (6 marks)

    b) Draw the SF and BM diagrams for the overhanging beam carrying UDL of 2 KN/m over the entire length and a point of 2KN as shown in fig. Locate the point of contra flexure.
                                                                                                     (8 marks)

OR

4 a) Define shear force and bending moment with sign conventions (4 Marks)

  b) Draw shear force and bending moment diagram for the shown in fig indicating principal values (10 marks)
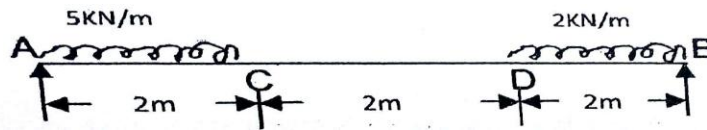
UNIT III

5. a) Write the assumptions of theory of simple bending (4 Marks)

  b) A timber beam of rectangular section is to support a load of 20 KN over a span of 4m. If the depth of the section is to be twice the breadth and the stress in the timber is not to exceed 60 N/mm^2, find the dimensions of the cross section. How would you modify of the beam it were a concentrated load placed at the centre with the same ratio of breadth to depth. (10 Marks)

OR

6. a) Derive the shear stress distribution over rectangular section (7 marks)

  b) A beam of triangular cross section with base b and height h is used with the base horizontal .calculate the intensity of max shear stress and plot the variation of shear stress intensity over the section (7 marks)

UNIT IV

7. state the assumptions and Derive the theory of pure torsion equation (14 Marks)

OR

8. A beam AB of 6m span in simply supported at the ends and in loaded as shown in fig. Determine (i) deflection at C (ii) Max deflection (iii) slope at end A. Take E= $2X10^5 N/mm^2$ and I= 2000 cm^4 (14Marks)

6KN   2KN/m

2m   1m   3m
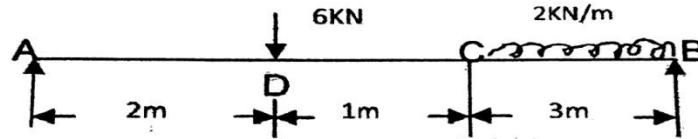
UNIT V

9a) Derive the formula for longitudinal and circumferential stresses   (7Marks)

b).A cylindrical shell 2.4 m long 0.6 meter in diameter is made up of 12 mm thin plate. Find the change in length and diameter when the shell is subjected to an internal pressure of $2N/mm^2$. Take E= $2x10^5$ N/mm^2 and µ=0.25   (7 Marks)

OR

10.A compound cylinder formed by shrinking one bite onto another is subjected to an internal pressure of 50 N/mm^2. Before the fluid in admitted, the internal and external diameters of the compound cylinder are 100 mm and 180 mm and the diameter at the junction is 150 mm.If after striking on, the radial pressure at common surface is 8 N/mm^2, calculate the final stresses set up by the section   (14 marks)

K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA
B.Tech. III Semester (R15)
Branch: ECE
Model Paper
Subject: ELECTRICAL MACHINES

Time: 3 Hours   Max. Marks: 70

Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks.

UNIT-I

1.   a) Explain the working principle and constructional details of DC Generator with a neat Sketch

b) Explain the OCC of generator and find the Critical speed & Critical Resistance

(OR)

2.   a) Derive the Torque equation of DC Motor.

b) Determine the Developed Torque & Shaft Torque of 220V,4 Pole Series Motor with 800 Conductors Wave Connected Supply a lode of 8.2 KW by taking 45A from the mains. The flux per pole is 25mWb and it's Armature circuit resistance is 0.6Ω.

UNIT-II

3.   a) Derive the equation for the EMF induced in the Transformer.

b) Draw and explain no-load Vector Diagram of Practical Transformer.

(OR)

4.   a) Explain OC & SC Test on 1-φ Transformer Develop the Equivalent Circuit From the test's.

b) Obtain the approximate equivalent circuit of a given 200/2000V,1-φ, 25KVA Transformer having the following test Results

Test	Voltage	Current	Wattmeter Reading
OC test	200	6	350W
SC Test	70	15	600W

UNIT-III

5. Explain Construction and working principle of 3-φ Induction motor a) Sqirrelcage
   b)Slip ring

(OR)

6. a) Derive the Torque equation of 3-φ Induction Motor.

b) The power input to the rotor of a 3-φ,50Hz,6-Pole IM is 80KW, the Rotor EMF makes 120 complete alternations per minute. Find a)Slip b) Motor Speed c) Mechanical power developed d) Rotor copper loss per phase.

UNIT-IV

7. a) Explain the constructional details and principle of operation of a synchronous machine.

b) Find the voltage of a 10-pole 3-φ,50Hz, star connected alternator with 60 slots and 4 Conductors per Slot the Coil span is 150^0 flux per pole is 0.12Wb and it is sinusoid distributed.

(OR)

8. a) Explain Synchronous impedance method to pre-determine the regulation of an alternator

b) A 550V,55KVA,1-φ Alternator has an effective resistance of 0.25Ω a field circuit of 10A producer an Armature Current of 200A on Short Circuit and an EMF of 500 V on Open Circuit calculate Z_s, X_s and full load voltage regulation at 0.8pf lagging

UNIT-V

9. a) Explain the construction and Working principle of Stepper motor

b) Draw the connection Diagram of Capacitance start and Capacitor Run 1-φ IM and explain the operation.

(OR)

10. a) Explain the principle of operation an AC Servo motor.

b) Explain why 1-φ IM is not self starting.

Model Question Paper
(1599301) ELECTRICAL & ELECTRONICS ENGINEERING
B.Tech. III Semester (CSE) (R15) Degree Examinations

Time: Three Hours   **Maximum: 70 Marks**

Note: Answer any FIVE questions by choosing one from unit.
   All questions carry equal marks.

UNIT-I

1. Define the following.

   a) Active and Passive Elements   (2M)

   b) Linear and Nonlinear Elements   (2M)

   c) Unilateral and Bilateral Elements   (2M)

   d) Explain Kirchhoff's Laws.   (5M)

   e) Derive the R_{eq} when three resistors are connected in parallel.   (3M)

{OR}

2. a) Give necessary equations to find the star network for a given delta network.   (7M)

   b) Find R_{AB} for the given network below.   (7M)
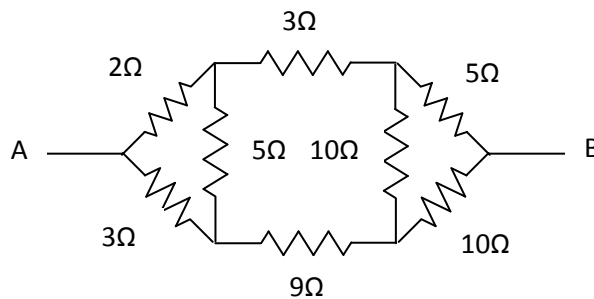
UNIT-II

3. a) Derive the EMF equation of a DC generator.   (7M)

   b) Explain the different losses occur in a DC machine.   (7M)

{OR}

4. a) Discuss the constructional details of a single phase transformer.   (7M)

   b) Obtain the equivalent circuit of a 1KVA, 100V/200V, 50Hz single phase

      transformer which given the test results.   (7M)

OC Test	100V	0.8A	40W

SC Test	12V	5A	50W

UNIT-III

5. a) Describe the operation of P-N Junction Diode under forward bias and reverse bias? (7M)

   b) Draw the V-I Characteristics of P-N Junction diode and what are the applications

   of it?　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(7M)

{OR}

6. a) Compare half wave rectifier with Full wave rectifier?　　　　　　　　(7M)

   b) Explain Zener Diode as Voltage Regulator?　　　　　　　　　　　　　(7M)

UNIT-IV

7. a) Explain the input and output characteristics of a transistor in CB Configuration?　(7M)

   b) Explain SCR Operation and its Characteristics?　　　　　　　　　　　(7M)

{OR}

8. a) Explain Single Stage CE amplifier and its Frequency Response?　　　　(7M)

   b) Explain the operation of a N-P-N Transistor?　　　　　　　　　　　　(7M)

UNIT-V

9. a) Explain the synchronous impedance method to find the regulation of an alternator. (10M)

   b) A 3 phase induction motor has 2 poles and is connected to 400V, 50Hz supply.

   Calculate the actual rotor speed and rotor frequency when the slip is 4%.　(4M)

{OR}

10. a) what is an OP-AMP? What are the characteristics of an ideal Op-Amp?　(5M)

   b) Explain Integrator?　　　　　　　　　　　　　　　　　　　　　　　(9M)

Code: ((1599303)

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
III semester (R15) Supple. Examinations
Basic Electrical & Electronics Engineering((1599303)
(Mechanical Engineering)
MODEL QUESTION PAPER

Time: 3 Hours   Max.Marks:70

NOTE: *1. Answer any FIVE questions, choosing one question from each Module*
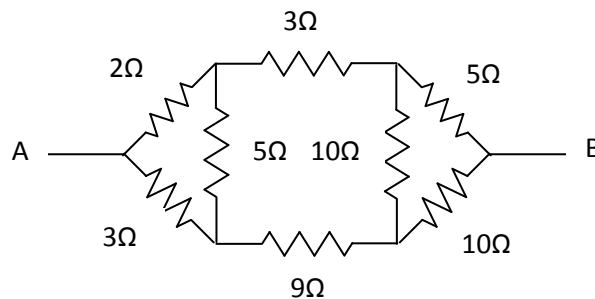   *2. All questions carry equal marks*

MODULE-I

1. Define the following.

A) Active and Passive Elements   2M

B) Linear and Nonlinear Elements   2M

C) Unilateral and Bilateral Elements   2M

D) Explain Kirchhoff's Laws.   5M

E) Derive the R_{eq} when three resistors are connected in parallel.   3M

{OR}

2. A) Give necessary equations to find the star network for a given delta network.   7M

   B) Find R_{AB} for the given network below.   7M

MODULE-II

3. A) Derive the EMF equation of a DC generator.   7M

   B) Explain the different losses occur in a DC machine.   7M

4. A) Discuss the constructional details of a single phase transformer.   7M

   B) Obtain the equivalent circuit of a 1KVA, 100V/200V, 50Hz single phase transformer which given
      the test results.   7M

OC Test	100V	0.8A	40W
SC Test	12V	5A	50W

MODULE-III

5. A) Explain the forward bias characteristics of a PN junction diode and plot the graph for V-I.   10M

   B) Write the application of a PN junction Diode.   4M

{OR}

6. A) Explain the operation of a half wave rectifier with the help of a circuit diagram.   10M

   B) What are the advantages of a bridge rectifier?   4M

MODULE-IV

7. A) Explain the operation of NPN transistor.   7M

   B) Draw the frequency response curve for CE amplifier and explain it.   7M

{OR}

8. A) Derive an expression for gain of an amplifier with negative feedback.   7M

   B) Draw the SCR characteristics curves and explain.   7M

MODULE-V

9. A) Explain the synchronous impedance method to find the regulation of an alternator.   10M

   B) A 3 phase induction motor has 2 poles and is connected to 400V, 50Hz supply. Calculate the actual
      rotor speed and rotor frequency when the slip is 4%.   4M

{OR}

10. A) Draw the circuit symbols of basic logic gates and write the truth tables of them.　　　　5M

B) Draw the block diagram of a CRO and explain in detail.　　　　9M