AR13
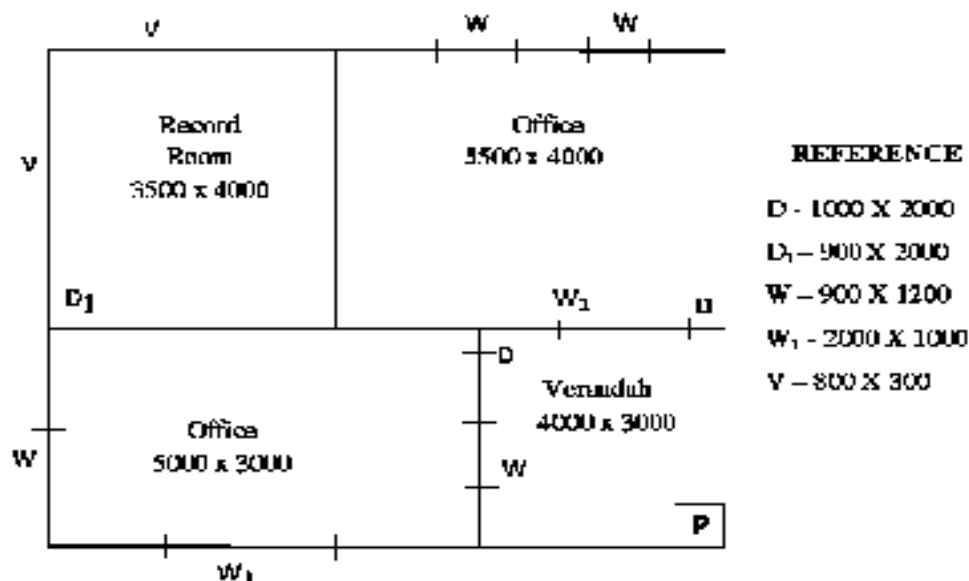
Time: 3 Hours   Max Marks: 70

PART-A

Answer any Three questions from Part-A   **[3 X 14 = 42 M]**

1. a) Write a short notes on Floor area ratio, how is it related to the height of the [7M] building? Explain
   b) Explain how the provision is made for different open spaces with sizes according to [7M] bye Laws?
2. a) Name the rooms which can be used to serve different purposes in a residential [5M] house
   b) What are the factors to be considered by planner prior to planning of residential [9M] building ? explain one of them in detail.
3. a) Explain the planning factor in the design of an auditorium [7M]
   b) Discuss the salient features of the functional design of the following buildings. [7M]
      i) Hotels   ii) Office building
4. a) Write a short notes on scheduling and monitoring Bar – Chart [7M]
   b) Differentiate clearly between PERT and CPM methods? [7M]
5. a) What are the planning factors to be considered in the design of dispensary? [7M]
   b) What is the importance of open space requirements according to building bye-laws? [7M]

PART-B

Answer any one question from Part-B   **[1X28=28M]**

6. (a) Draw sign conventions of earth, rock, sand filling, concrete, timber and marble? [9M]
   (b) Draw the section and elevation of paneled door [19M]
7.   Draw the plan, section and elevation of the given line diagram? [28M]

CODE: 13EE3014
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
POWER SYSTEMS – II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours   Max Marks: 70

PART-A

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

1. a)   Define Skin effect?
    b)   The inductance of a three phase transmission line is 1.2 mH/phase/km. If the spacing of the conductors and the radius of the conductor are doubled what is the inductance of the line will be?
    c)   What is value of the coefficient of reflection voltage for a short circuited line?
    d)   For a 500 Hz frequency excitation a 50 km long power line will be modeled as ………….?
    e)   Write the expression for Sag?
    f)   The surge impedance of a 400 km long over head transmission line is 400 ohms what is the surge impedance of the line for 200km?
    g)   If the supply frequency increases then skin effect is………?
    h)   What is nature of line constants in the rigorous solution?
    i)   Write the classification of insulators?
    j)   What is the relationship between A, B, C and D constants in any transmission line?

PART-B

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

UNIT-I

2. (a) Calculate the capacitance of a two wire line, if the conductors are spaced equally, how do you calculate the capacitance of a three –phase line?
    (b) A 220 kV, three-phase bundle conductor line with two sub conductor per phase has a horizontal configuration as shown in below Figure. Find the inductance per phase, if the radius of each sub conductor is 1.35cm
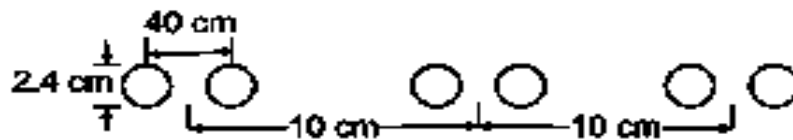
(OR)

3. (a) What is the effect of unsymmetrical spacing of conductors in a 3-phase transmission line?
    (b) Derive the formula for the internal inductance in H/m of a hollow conductor having inside radius r1 and outside radius r2 and also determine the expression for the inductance in H/m of a single – phase line consisting of the hollow conductors described above with conductors spaced a distance D apart.

UNIT-II

4. (a) Show how regulation and transmission efficiency are determined for medium lines using end -condenser method and illustrate your answer with suitable vector diagram

   (b) A three phase transmission line is 135 km long. The series impedance is Z=0.04+ j 0.95 ohms per phase per km, and shunt admittance is Y=j 5.1×10−6 mhos per phase per km. The sending end voltage is 132 kV, and the sending end current is 154 A at 0.9 power factor lagging. Determine the voltage, current and power at the receiving end and the voltage regulation using medium line-T model.

(OR)

5. (a) What is the justification in neglecting line capacitance in short transmission lines?

   (b) A 3 phase 50Hz transmission line 100 Km long delivers 20MW at 0.9 p.f lagging and at 110kv. The resistance and reactance of the line per phase per km are 0.2 Ω and 0.4 Ω respectively, while capacitance admittance is $2.5*10^{-6}$ Siemens/km/phase. Calculate current and voltage at the sending end. Use nominal T method?

UNIT-III

6. (a) Using rigorous method, derive expressions for sending end voltage and current for a long transmission line.

   (b) A 50 Hz transmission line 300 km long has a total series impedance of 40+j125 ohms and a total shunt admittance of 10-3 mho. The receiving-end load is 50Mw at 220kV with 0.8 lagging power factor. Find the sending-end voltage, current, power and power factor using rigorous method.

(OR)

7. (a) What do understand by long transmission lines? How capacitance effects are taken into account in such lines?

   (b) A voltage having a crest value of 3000 kV is traveling on a 750 kV line. The protective level is 1700 kV and the surge impedance of the line is 300 Ω. Calculate (i) the current in the line before reaching the arrester, (ii) current through the arrester, (iii) the value of arrester resistance for this condition and (iv) reflect voltage. Verify the reflection and refraction coefficient.

UNIT-IV

8. (a) When the transmission line is terminated by impedance. How do you find the reflected voltage and current wave

   (b) The ends of two long transmission lines, A and C are connected by a cable B, 100 km long. The surge impedances of A, B, C are 500, 70 and 600 ohms respectively. A rectangular voltage wave of 20 kV magnitudes and of infinite length is initiated in A and travels to C. Determine the first and second voltages impressed on C.

(OR)

9 (a) Explain the phenomenon of corona? How can be the corona loss are minimized in transmission lines.

(b) Determine the disruptive critical voltage and the critical voltages for local and general corona on a 3-phase overhead transmission line, consisting of three stranded copper conductors, spaced 3 meters apart at the corners of an equilateral triangle. Air temperature and pressure are 21°C and 73.5 cm of mercury respectively. Conductor diameter is 2.2 cm. Take air density factor 3.92 b/ (273 + t), irregularity factor (m) = 0.82 and surface factors (mv) for local and general corona = 0.7 and 0.8 respectively. Break down strength of air is 21.21 kV (r.m.s) per cm.

UNIT-V

10 (a) A string of 5 insulators is connected across a100kV line. If the capacitance of each disc to earth is 0.1 of the capacitance of the insulator, calculate (i) the distribution of voltage on the insulator discs and (ii) the string efficiency.

(b) Explain various methods of improving string efficiency?

(OR)

11 (a) Explain the effect of wind and ice on sag of the conductor?

(b) A string of 5 insulator units has a self-capacitance equal to 11 times the pin to Earth capacitance. Find the string efficiency?

3 of 3

***

CODE: 13ME3013
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
DYNAMICS OF MACHINERY
(MECHANICAL ENGINEERING)

Time: 3 Hours   Max Marks: 70

PART-A

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

1. a) Define Applied force and Constraint force
    b) State D'Alembert's Principle
    c) Define the sensitivity of a governor
    d) Explain briefly how the gyroscopic couple affects the motion of an aircraft while takes a left turn
    e) Define the terms :Coefficient of friction and Limiting angle of friction
    f) What is the purpose of a clutch in an automobile?
    g) What is meant by a self-locking and a self-energized brake
    h) Describe the concept of primary and secondary unbalance in reciprocating engines
    i) Define the basic elements of a vibratory system
    j) Write an expression for Magnification Factor (M F). What is its effect on damping factor.

PART-B

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

UNIT-I

2. Determine the required input torque on the crank of a slider crank mechanism for the static equilibrium when the applied piston load is 1500 N. The lengths of the crank and the connecting rod are 40 mm and 100 mm respectively. The crank has turned through 45^0 from the Inner Dead Centre.

(OR)

3. The cranks of a three cylinder single acting engine are set equally at 120^0. The engine speed is 540 rpm. The turning moment diagram for each cylinder is a triangle for the power stroke with a maximum torque of 100 N-m at 60^0 after dead center of the corresponding crank. The torque is sensible zero on the return stroke, Determine (i) power developed, (ii) coefficient of fluctuation of speed if the flywheel has a mass of 7.5 kg with a radius of gyration of 65 mm, (iii) coefficient of fluctuation of energy, (iv) maximum angular acceleration of the fly wheel.

UNIT-II

4. A Hartnell governor has two rotating balls of mass 2.7 kg each. The ball radius is 125 mm in the mean position when the ball arms are vertical and the speed is 150 rpm with the sleeve rising. The length of the ball arms is 140 mm and the length of the sleeve arm is 90 mm. The stiffness of the spring is 7kN/m and the total sleeve movement is 12 mm from the mean position. Allowing for a constant friction force of 14N acting at the sleeve, determine the speed range of the governor in the lowest and highest sleeve positions. Neglect the obliquity of the ball arms.

(OR)

5.   The total mass of a four wheeled trolley car is 1800 kg. The car runs on rails of 1.6 m gauge and rounds a curve of 24 m radius at 36 km/hr. the track is banked at 10^0. The external diameter of the wheels is 0.6 m and each pair with axle has mass of 180 kg with a radius of gyration of 0.24 m. The height of the center of mass of the car above the wheel base is 0.95 m. Determine the pressure on each rail allowing for centrifugal force and gyroscopic couple actions.

UNIT-III

6   Determine the axial force required to engage a cone clutch transmitting 25 kW of power at 75^0 rpm. Average friction diameter of the cone is 400 mm and average pressure intensity is 60 kN/m^2. Semi cone angle is 10^0 and coefficient of friction is 0.25. Also find the width of the friction cone.

(OR)

7   A wheel having a wheel base of 3.2 m has its center of mas at 1.4 m from the rear wheels and 55 mm from the ground level. It moves on a level ground at a speed of 54 km/h. Determine the distance moved by the car before coming to rest when the brakes are applied to (i) rear wheels (ii) front wheels (iii) all the four wheels. The coefficient of friction between the tyres and the road is 0.5.

UNIT-IV

8   Four masses A, B, C, and D are completely balanced. Masses C and D make angles 90^0 and 210^0 respectively with B in the same sense. The planes containing B and C are 300 mm apart. Masses A, B, C and D can be assumed to be concentrated at radii of 360 mm, 480 mm, 240 mm, and 300 mm respectively. The masses B,C, D are 15 kg, 25 kg, and 20 kg respectively. Determine (i) mass A and its angular position, (ii) position of planes A and D.

(OR)

9   A single –cylinder reciprocating engine has a reciprocating mass of 60 kg. The crank rotates at 60 rpm and the stroke is 320 mm. The mass of the revolving parts at 160 mm radius is 40 kg. If two thirds of the reciprocating parts and the whole of the revolving parts are to be balanced, determine the balance mass required at the radius of 350 mm

UNIT-V

10   A refrigerator unit having a mass of 35 kg is to be supported on three springs, each having spring stiffness of **k**. The unit operates at 480 rpm. Find the values of stiffness **(k),** if (i) only 10% of the shocking force is allowed to be transmitted to the supporting structure. (ii) 25% of the shocking force is allowed to be transmitted to the supporting structure.

(OR)

11   The following data relate to a shaft held in long bearings: length of the shaft is 1.2 m, diameter of the shaft is 14 m, mass of the rotor at the mid-point is16 kg, eccentricity of the center of mass of the rotor from the center of the rotor is 0.4 mm, E=200GN/m^2, and permissible stress in the shaft material is 70 X10^6 N/m^2. Determine the critical speed of the shaft and the range of speed over which it is unsafe to run the shaft, Assume that the shaft to be massless.

****

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
LINEAR IC APPLICATIONS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

PART-A

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

1.
a) Draw the Block Diagram of Op-Amp
b) Define CMRR
c) What is need for Frequency Compensation Technique
d) Mention any Two Characteristics of Ideal Op-Amp
e) Draw the Circuit Diagram of AC Amplifier
f) Differentiate between Op Amp as Schmitt Trigger and Op-Amp as Comparator
g) For an all pass filter, R = 8 KΩ and C = 0.02μF. If the input frequency is 2 KHz, calculate the phase shift.
h) Define Monotonicity
i) What is the importance of 4th Pin in 555 Timer
j) IC 1496 is _____

PART-B

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

UNIT-I

2. (a) The following Specifications are given for the Dual-Input, balanced-Output differential Amplifier R_C=3 KΩ, R_E=5 KΩ,R_{in1}=R_{in2}= 50Ω ,+V_{cc}=10 V, -V_{ee}=10 V and the Transistor is CA3086 $β_{ac}$= $β_{dc}$ =100 and V_{BE}=0.715 V. Determine V_{CEQ}, I_{CQ}, Voltage Gain, Z_I, Z_O **[6M]**

    (b) What is the need for level translator? Explain the Operation of any one Level Translator Circuit.   **[6M]**

(OR)

3. (a) Explain how large open circuit voltage gain of an op-amp can be obtained by cascading differential amplifiers.   **[6 M]**

    (b) What are Properties of Four Type of Differential Amplifiers Configuration   **[6 M]**

UNIT-II

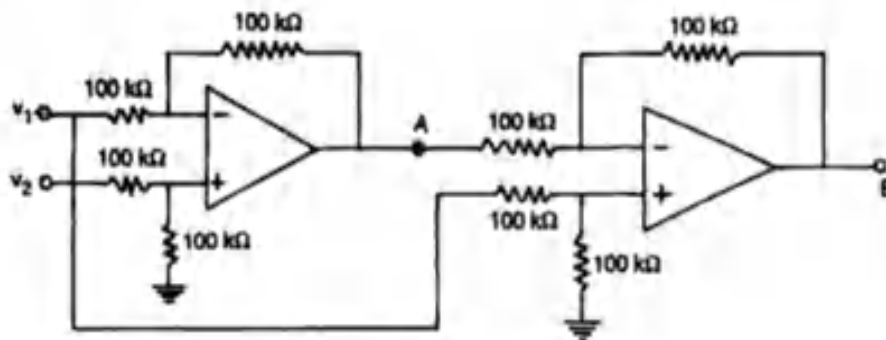4. (a) What is the Voltage at Point A and B for the circuit shown in Figure -1 if V_1=6 V,V_2=7 V   **[7 M]**

Figure-1

    (b) Define Input Bias Current and How can it be Reduced   **[5M]**

(OR)

5 (a) Explain about Dominant Pole Compensation [6 M]

(b) Derive the expression for slew rate of an Op-Amp .An Op-Amp has a slew rate of 1.5 V/μs. What is the maximum frequency of an output sinusoid of peak value 10V at which the distortion sets in due to slew rate limitation? [6 M]

UNIT-III

6 (a) Design an Integrator using Op-Amp that will Integrate an Input Signal with Frequency 1 KHz. [6 M]

(b) Explain the Operation of Precision Half –Wave rectifiers. [6 M]

(OR)

7 (a) With the help of a neat circuit, explain the working of Anti log amplifier. [6 M]

(b) Explain Voltage to Current Converter with Grounded Load [6 M]

UNIT-IV

8 (a) Design first order active high pass filter at a cut off frequency of 500 Hz and a pass band gain of 2 [6 M]

(b) Explain about Best Digital to Analog Converter using Op-Amp (4 Bit) and also Derive the expression for output voltage. [6 M]

(OR)

9 (a) Explain about Successive Approximation ADC with Neat Diagram. [8 M]

(b) Design a 70 Hz Notch Filter [4 M]

UNIT-V

10 (a) Explain the working of 555 Timer as Monostable multibrator and derive an expression for Gate width. [8 M]

(b) Draw the functional block diagram of 555 Timer [4 M]

(OR)

11 (a) Draw the block Diagram of Phase Locked Loop and describe the Function of each Block Briefly [7 M]

(b) Explain how 555 Timer can be used as a FSK Generator [5 M]

***

AR13

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
INDUSTRIAL MANAGEMENT SCIENCE
(COMMON TO CSE & IT)

Time: 3 Hours   **Max Marks: 70**
PART-A

                                                                [1X10=10M]

ANSWER ALL QUESTIONS

1 a) Importance of Management
  b) Administration
  c) Public Enterprise
  d) Working Capital
  e) Survey Method
  f) Judgmental approach
  g) Isocosts
  h) Fixed Cost
  i) Imperfect Competition
  j) Price Fixation

PART-B
Answer one question from each unit   **[5x12=60M]**
UNIT-I
2 a) Discuss the contribution of FW Taylor's towards scientific management. Explain the
benefits derived from scientific management.   [4+4]
b) Differentiate between Theory X and Theory Y.   [4]
(OR)
3 a) What is systems approach to management. Discuss the functions of management under this
   approach.   [6]
b)   Explain various types of leadership styles.   [6]

UNIT-II
4 a) Define partnership? What is partnership deed? Discuss different kinds of partners. [2+2+3]
b) Discuss the procedure involved in formation of a company.   [5]

(OR)
5 a) What is the need for a public sector enterprise?   [4]
  b) Discuss briefly any two forms of public enterprise with its features and advantages. [4+4]

UNIT-III
6 a) Explain the various factors governing elasticity of demand.   [8]
b) Explain the significance of elasticity of demand.   [4]

(OR)

7 a) What is demand forecasting. Explain
      i) Expert Opinion Method
      ii) Test Marketing
      iii) Controlled Experiment   [2+6]
b)

Time Period	Actual Sales (Units in Lakhs)	Predicted Sales (Units in Lakhs)
1	5	
2	5.6	
3	6.7	
4	5.8	
5	6.9	
6	5.1	
7	8.1	

    Assume a four period moving average as the initial forecast. Calculate the sales for the 5th
    year and 6th year.   [4]

UNIT-IV

8 a) What are the factors of production? How do they influence the production function in an
    enterprise?   [2+4]
  b) Discuss Cobb Douglas Production function with assumptions.   [4+2]

(OR)

9 a) Discuss the differences between   [4]
      i) Explicit vs Implicit cost
      ii) Out of pocket vs Imputed costs
  b) The following information is extracted from the records of XYZ Company Limited.

Particulars	Amount(in Rs)
Fixed Cost	50,000/-
Selling Price/unit	10/-
Variable Cost/unit	6/-

    Determine   a) P/V ratio
                 b) Breakeven point in terms of value (in Rs)
                 c) Breakeven point in terms of units
                 d) Margin of safety when sales are 15,000 units   [2+2+2+2]

UNIT-V

10 a) Distinguish between perfect and monopolistic competition. How do you determine price
    and output in case of monopoly.   [3+3]
  b) Discuss any three concepts of time element in determination of price.   [6]

(OR)

11 a) Explain the economic consequences of price control. What are the factors to be considered
    before price fixation.   [6]
  b) Discuss any three forms of price discrimination.   [6]