AR13

CODE: 13CE3010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, October-2017
BUILDING PLANNING AND DRAWING
(Civil Engineering)

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

PART-A

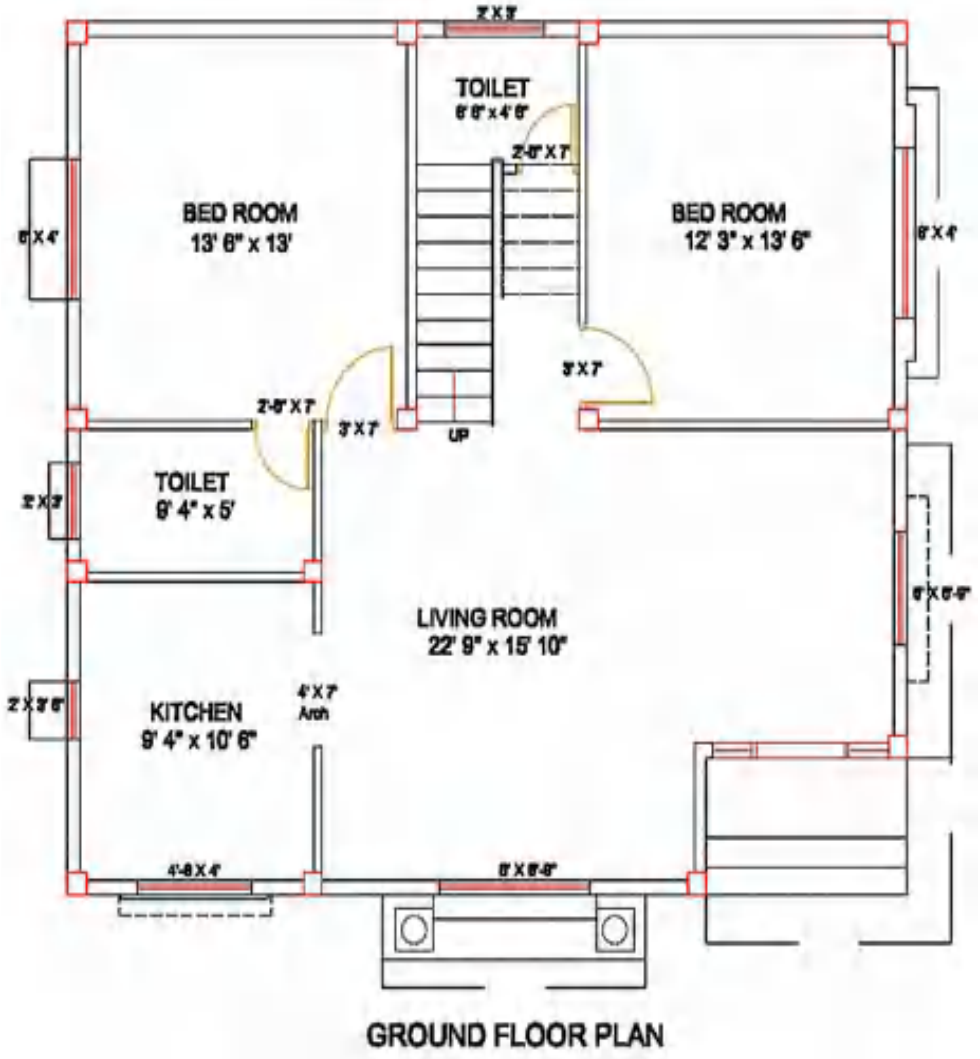
Answer any THREE questions from Part-A **[3 X 14 = 42 M]**

1.	a)	Explain various principles of Open space requirements, built up area limitations Height of Buildings as per building bye laws.	[7M]
	b)	Explain the characteristics of various types of residential buildings.	[7M]
2	a)	Explain about the planning of building for recreation.	[7M]
	b)	Explain about the planning of building for industrial purpose.	[7M]
3.	a)	Explain the aspects in scheduling and monitoring bar charts.	[7M]
	b)	List down the sign conventions for seven building materials.	[7M]
4.	a)	Differentiate and compare English, Flemish with neat Diagrams.	[7M]
	b)	Classify and explain about stone masonry.	[7M]
5.	a)	Classify different types of trussed roofs and explain about them.	[7M]
	b)	Classify different types of sloping roofs and explain about them.	[7M]

Answer any **one** question from Part-B **[1x28=28M]**

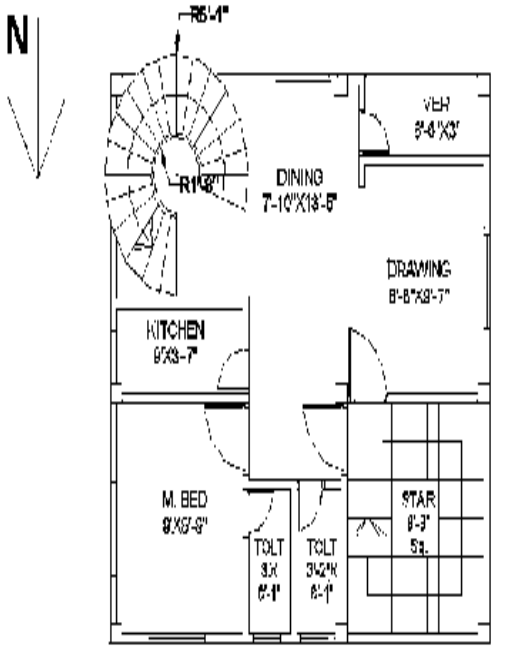
PART-B

6**.**	(a)	Explain the types of formwork for construction of domes with neat sketches.	[8M]
	(b)	Draw the plan and elevation of the given line diagram m.for G+1 building	[20M]



GROUND FLOOR PLAN

7. Draw the plan, section and elevation of the given line diagram for a G+1 building [28M]



1ST FLOOR

AR13 SET-2

CODE: 13EE3014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, October-2017
POWER SYSTEMS – II
(Electrical and Electronics Engineering)

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

PART-A

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

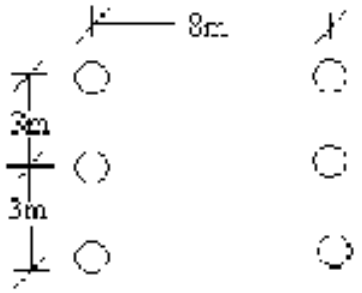
1. a) List the factors on which both Skin effect and Proximity effect depends?
   b) A 100 km transmission line is designed for a nominal voltage orf 132 kv and consists of one conductor/phase. The line inductance is 1.2mH/km and capacitance is 0.5 micro F / km the transmission capacity of the line would be?
   c) The dimension of constants 'B' and 'C' respectively are…?
   d) For a short transmission line at what load power factor the regulation will become zero?
   e) Write the expression for Corona power loss?
   f) List out the factors effecting sag?
   g) The coefficient of reflection for current of an open ended line is given by?
   h) Which type insulator can be used for transmission lines?
   i) Give the expression for string efficiency?
   j) To get better voltage regulation for medium transmission line which method is preferred?

PART-B

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

UNIT-I

2. (a) What is the effect of unsymmetrical spacing of conductors in a 3-phase transmission line?
   (b) Calculate the inductance per phase of a three-phase, double circuit line as shown in figure. The diameter of each conductor is 1.5 cm.

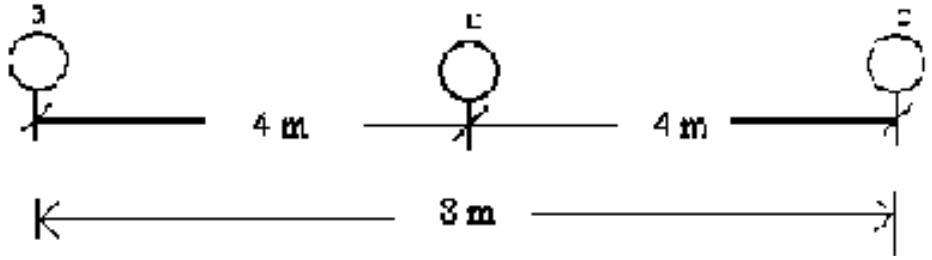


(OR)

3. (a) Find the capacitance of phase to neutral per km of a three-phase line having conductors of 2 cm diameter placed at the corners of a triangle with sides 5 m, 6 m, and 7m respectively Assume that the line is fully transposed and carries balanced load?

CODE: 13EE3014

(b) Calculate the inductance per phase of a three-phase transmission line as shown in Figure. The radius of the conductor is 0.5 cm. The lines are un-transposed.



UNIT-II

4. (a) What is the effect of load power factor on regulation and efficiency of a transmission line?

(b) A 3-phase, 50 Hz, overhead transmission line delivers 10MW at 0.8p.f lagging and at 66kV.The resistance and inductive reactance of the line per phase are 10Ω and 20Ω respectively while capacitance admittance is 4x10-4 Siemens. Calculate: (i) the sending end current (ii) sending end voltage (line to line) (iii) sending end power factor (iv) transmission efficiency. Assume nominal T method.

(OR)

5 (a) What do you understand by the terms 'nominal-T' and 'nominal-π' circuits?

(b) A three phase line is 130km long. The series impedance is z=0.036+j 0.3 ohm per phase per km, and the shunt admittance is y=j4.22 micro Siemens per phase per km. The sending end voltage is 345kv, and the sending end current is 400A at 0.95 power factor lagging. Use medium line model (nominal π)to find the voltage ,current and power at the receiving end.

UNIT-III

6 (a) A 500-kv three phase transmission line is 250km long. The series impedance is z=0.045+j 0.4 ohm per phase per km and the shunt admittance is y=j4 micro Siemens per phase per km. Evaluate equivalent π model.

(b) Derive the sending end quantities for a long line using rigorous solution

(OR)

7 (a) A three-phase, 50 Hz, 160 km long transmission line has three conductors each of 0.75 cm radius spaced at the corners of triangle of sides 2.5 m, 3m and 3.5m. The resistance of each conductor is 0.3 ohms per km and the line delivers 30 MVA at 132 kV and at a lagging p.f. of 0.95. Determine ABCD constants as i) long line and ii) Parameters of equivalent T representations of long lines?

(b) Explain about the surge impedance and give its significance?

CODE: 13EE3014

UNIT-IV

8 (a) When the transmission line is terminated by open end and short circuited end, how do you find the reflected voltage and current wave

(b) A three phase 220KV, 50Hz transmission line consists of 1.2cm radius conductor spaced 2 meters apart in equilateral triangular formation. Find the disruptive critical voltage between the lines, if the temperature is 20^0C and atmospheric pressure is 72.2cm.Take mo=0.96. Dielectric strength of air=21.1KV (rms)/cm.(assume any data if necessary)

(OR)

9 (a) Two stations are connected together by an underground cable having a surge impedance of 30 ohms joined to an overhead line with a surge impedance of 300 ohms. If a surge having a maximum value of 115 kV travels along the cable towards the junction with the overhead line, determine the value of the reflected and the transmitted wave of voltage and current at the junction.

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

UNIT-V

10 (a) In a 33kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find (i) the distribution of voltage over 3 insulators and (ii) string efficiency

(b) Deduce an approximate expression for sag in overhead lines when (i) supports are at equal levels (ii) supports are at unequal levels.

(OR)

11 (a) Each line of a three phase system is suspended by a string of 4 similar insulators. If the voltage across the second unit is 15 kV and across the third unit is 27.0 KV, calculate the voltage between conductors and string efficiency.

(b) What do you mean by sag on transmission line? Find out the expression of the sag of the transmission line?

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AR13

CODE: 13ME3013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, October-2017
DYNAMICS OF MACHINERY
(Mechanical Engineering)

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

PART-A

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

1. **a)** What is the turning moment diagram?
   b) Write an expression for fluctuation of energy in flywheel.
   c) Write an expression for gyroscopic couple?
   d) Define hunting of a governor.
   e) What is the difference between flywheel and governor?
   f) Write an application of shoe brakes.
   g) Differentiate between static balancing and dynamic balancing of shafts.
   h) Write an expression for hammer blow in locomotive.
   i) Define critical speed
   j) Write an expression for logarithmic decrement.

PART-B

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

UNIT-I

2. During forward stroke of the piston of the double acting steam engine, the turning moment has the maximum value of 2000 N-m when the crank makes an angle of 80° with the inner dead centre. During the backward stroke, the maximum turning moment is 1500 N-m, when the crank makes an angle of 80° with the outer dead centre. The turning moment diagram for the engine may be assumed for simplicity to be represented by two triangles. If the crank makes 100 r.p.m. and the radius of gyration of the flywheel is 1.75 m, find the coefficient of fluctuation of energy and the mass of the flywheel to keep the speed within ± 0.75% of the mean speed. Also determine the crank angle at which the speed has its minimum and maximum values.

(OR)

3. A certain machine requires a torque of (5000 + 500 sin θ) N-m to drive it, where θ is the angle of rotation of shaft measured from certain datum. The machine is directly coupled to an engine which produces a torque of (5000 + 600 sin 2θ) N-m. The flywheel and the other rotating parts attached to the engine has a mass of 500 kg at a radius of gyration of 0.4 m. If the mean speed is 150 r.p.m., find : 1. the fluctuation of energy, 2. the total percentage fluctuation of speed, and 3. the maximum and minimum angular acceleration of the flywheel and the corresponding shaft position.

UNIT-II

4. In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100 mm and that of the horizontal arm is 50 mm. The distance of fulcrum of each bell crank lever is 80 mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75 mm and 112.5 mm. The maximum equilibrium speed is 5 per cent greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100 mm.

(OR)

5. A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions:
   i. The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius.
   ii. The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds.
   iii The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern.

UNIT-III

6. A band brake acts on the 3/4th of circumference of a drum of 450 mm diameter which is keyed to the shaft. The band brake provides a braking torque of 225 N-m. One end of the band is attached to a fulcrum pin of the lever and the other end to a pin 100 mm from the fulcrum. If the operating force is applied at 500 mm from the fulcrum and the coefficient of friction is 0.25, find the operating force when the drum rotates in the (a) anticlockwise direction and (b) clockwise direction.

(OR)

7. a) Explain the following terms
   i) Static Friction ii) Dynamic Friction iii) Angle of Repose [5 M]
   b) An effort of 1500 N is required to just move a certain body up an inclined plane of angle 12º, force acting parallel to the plane. If the angle of inclination is increased to 15º, then the effort required is 1720 N. Find the weight of the body and the coefficient of friction. [7 M]

AR13

CODE: 13ME3013 **SET-2**

UNIT-IV

8. A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has a radius of rotation of 60 mm. The masses at A and D have a radius of rotation of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine : 1. The magnitude of the masses at A and D ; 2. the distance between planes A and D ; and 3. the angular position of the mass at D.

(OR)

9. A four crank engine has the two outer cranks set at 120° to each other, and their reciprocating masses are each 400 kg. The distance between the planes of rotation of adjacent cranks are 450 mm, 750 mm and 600 mm. If the engine is to be in complete primary balance, find the reciprocating mass and the relative angular position for each of the inner cranks. If the length of each crank is 300 mm, the length of each connecting rod is 1.2 m and the speed of rotation is 240 r.p.m., what is the maximum secondary unbalanced force?

UNIT-V

10.a) Explain the following terms
i) Longitudinal Vibrations. ii) Transverse Vibrations. iii) Torsional Vibrations. [5M]

b)A shaft 50 mm diameter and 3 m long is simply supported at the ends and carries three loads of 1000 N, 1500 N and 750 N at 1 m, 2 m and 2.5 m from the left support. The Young's modulus for shaft material is 200 GN/m^2. Find the frequency of transverse vibration. [7 M]

(OR)

11. The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 N/mm. If the vibrating system have a dashpot attached which exerts a force of 40 N when the mass has a velocity of 1 m/s, find : 1. critical damping coefficient, 2. damping factor, 3. Logarithmic decrement, and 4. ratio of two consecutive amplitudes.

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AR13

CODE: 13ME2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, October-2017

DESIGN OF MACHINE MEMBERS - I
(Mechanical Engineering)

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

PART-A

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

1. a) Discuss in brief the factors which govern the selection of material for a machine component.
   b) How do you classify materials for engineering use?
   c) Define the term Notch sensitivity.
   d) Differentiate between fatigue strength and endurance strength.
   e) Suggest two methods for reducing stress concentration.
   f) Explain the various ways in which a riveted joint may fail.
   g) What is an eccentric loaded welded joint?
   h) What is pressure vessel and give some examples.
   i) What are the types of failures in keys?
   j) What is the advantage of flange coupling?

PART-B

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

UNIT-I

2. a) Explain the types of fluctuating stresses. **4M**
   b) A circular bar of 0.5 m length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 25 kN and a maximum value of 50 kN. Determine the diameter of bar by taking a factor of safety of 1.25, size factor of 0.85, surface finish factor of 0.9. The material properties of bar is given by: Ultimate strength of 650 MPa, Yield strength of 500 MPa and Endurance strength of 350 MPa. **8M**

(OR)

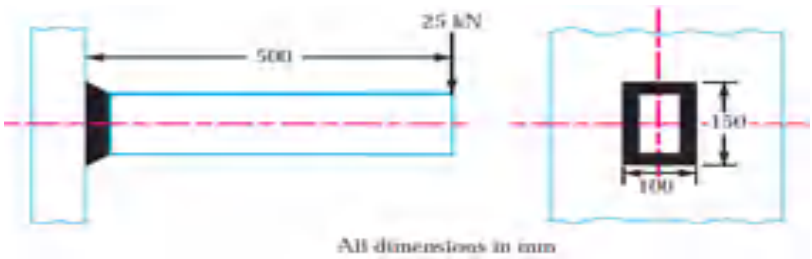
3. a) Explain simple stresses. **4M**
   b) State and explain various theories of failure under static loading. **8M**

UNIT-II

4. Design a double riveted butt joint with two cover plates for the longitudinal seam of a boiler shell 1.5 m in diameter subjected to a steam pressure of 0.95 N/mm^2 . Assume joint efficiency as 70 %, allowable tensile stress in the plate 90 MPa, compressive stress 140 MPa and shear stress in the rivet is 56 MPa. **12M**

(OR)

5. a) What are primary and secondary shear stresses in eccentrically loaded welded joints? What are the assumptions made in evaluating them? **4M**
   b) A rectangular cross-section bar is welded to a support by means of fillet welds as shown in figure. Determine the size of the welds, if the permissible shear stress in the weld is limited to 75 MPa. **8M**



UNIT-III

6. a) List advantages of bolted joints over welded joints. **4M**
   b) Explain the design procedure for the eccentrically loaded bolted joint. **8M**

(OR)

7. A disc of 50 cm diameter and uniform thickness is rotating at 2500 rpm. Determine the maximum stress induced in the disc. If a hole of 12 cm diameter is drilled at the centre of the disc, determine the maximum intensity of radial and hoop stresses induced. Poission's ratio is 0.28 and density of the material is 7800 kg/ m^3. **12M**

UNIT-IV

8. a) Explain stresses acting on keys. **4M**
   b) Design a sleeve and cotter joint to resist a tensile load of 50 KN. All parts of the joint are made of the same material with the following allowable stresses. σ_t = 60 MPa , τ = 70 MPa and σ_c =125 MPa. **8M**

(OR)

9. A line shaft is to transmit 30 KW at 160 rpm. It is driven by a motor placed directly under it by means of a belt running on a 1m diameter pulley keyed to the end of the shaft. The tension in the tight side of the belt is 2.5 times that of the slack side and the centre of pulley overhangs 150 mm beyond the centre line of the end bearing. Determine the diameter of the shaft, if the allowable shear stress is 56MPa and the pulley weighs 1600 N. **12M**

UNIT-V

10. a) Write the design procedure for a flexible coupling. **6M**
    b) A mild steel shaft has to transmit 70 kW at 240 rpm. The allowable shear stress in the shaft material is limited to 45MPa. Design a cast iron flange coupling. The shear stress in the coupling bolt is limited to 30MPa. **6M**

(OR)

11. A leaf spring 1.4 meters long is to be made of ten leaves, 60mm wide, two of which extends the full length of the spring. It is to have a deflection of 100mm when subjected to a load 3.5 KN. The leaves are held together at the center by a band 100mm wide. Determine the thickness for the leaves and the maximum stress induced. Take E = 0.21×10^6 N/mm^2. **12M**

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AR13

CODE: 13EC3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, October-2017

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) Define CMRR?
   b) In open loop mode, the output of an Non-inverting op-amp is____
   c) Summing Amplifier is also called ____
   d) Define bandwidth of low pass filter?
   e) Gain of an ideal op-amp is_____.
   f) Astable operation using IC 555 is also called _____
   g) Define Multiplexers?
   h) _____ Amplifier can be used as a inverter.
   i) Ideal op-amp has an output impedance_____
   j) AD574 is a_____ type of ADC.

PART-B

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

UNIT-I

2. Explain in detail about DC and AC analysis of dual input, unbalanced output differential amplifiers. [12M]

(OR)

3. (a) Write short notes on DC coupling. [6M]
   (b) Explain about Cascade differential amplifier stages [6M]

UNIT-II

4. (a) With neat diagram explain the operation of an op-amp using FET. [6M]
   (b) Explain about various op-amp parameters. [6M]

(OR)

5. Explain about
   (a) AC characteristics of an op-amp. [6M]
   (b) Dominant pole compensation [6M]

AR13

CODE: 13EC3012 **SET-2**

UNIT-III

6. (a) With neat diagram explain about an integrator circuit using IC 741. [6M]
   (b) Explain the operation of I to V converters using IC 741. [6M]

(OR)

7. Explain the operation of Instrumentation amplifier using IC 741. [12M]

UNIT-IV

8. Define cut off frequency? Explain about various types of active filters using IC741. [12M]

(OR)

9. a) With neat sketches, explain in detail about integrating type of ADC. [6M]
   b) With neat sketches, explain in detail about successive approximation type of ADC [6M]

UNIT-V

10. Explain the operation of Astable opertaion using IC 555 and IC 741. [12M]

(OR)

11. Explain about basic principle of PLL using IC 565 and derive the expression for lock-in range. [12M]

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AR13

CODE: 13HS3006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, October-2017

INDUSTRIAL MANAGEMENT SCIENCE
(Common to CSE & IT)

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

PART-A

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

1. a) Discuss the need of effective Industrial Management.
   b) What are the various Leadership Styles?
   c) Give a brief note on Partnership.
   d) What is ARR?
   e) Explain the term Demand.
   f) What is Demand Forecasting?
   g) What is MRTS?
   h) Write the limitations of BEA.
   i) List out the types of Competition.
   j) What do you understand by Market Structure?

PART-B

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

UNIT-I

2. Distinguish between Douglas McGregor's Theory X and Theory Y. [12M]

(OR)

3. (a) Discuss the importance of Management? [6M]
   (b) What are the social responsibilities of Management? [6M]

UNIT-II

4. Explain the following in-detail.
   (a) Characteristic features of Business [6M]
   (b) Nature and scope of Capital Budgeting [6M]

(OR)

5 A Manufacturing Company is evaluating two projects for investments and whose each cash flows are as follows [12M]

	Expected Cash Flows in INR	
YEAR	PROJECT- A	PROJECT- B
0	(900)	(900)
1	400	100
2	300	400
3	300	300
4	100	500

Compute Payback Period and NPV for both projects and the discount factor of NPV is 10 %.

UNIT-III

6		What are the different types of Elasticity of Demand? Explain their significance.	[12M]

(OR)

7		Explain the following.	
	(a)	Test Marketing	[6M]
	(b)	Expert Opinion Method.	[6M]

UNIT-IV

8	(a)	Explain in detail the Laws of Returns.	[6M]
	(b)	Discuss the Production Function with Least Cost combination of inputs?	[6M]

(OR)

9	(a)	Distinguish between Implicit and Explicit costs.	[6M]
	(b)	Explain the role of Break Even Point in Managerial Economics and highlight its significance?	[6M]

UNIT-V

10		Explain the concept of different Pricing Strategies.	[12M]

(OR)

11		Discuss the following in-detail.	
	(a)	Monopolistic Competition	[6M]
	(b)	Pricing Strategies	[6M]

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