

AR13

CODE: 13CE3010

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

BUILDING PLANNING AND DRAWING
(CIVIL ENGINEERING)

Time: 3 Hours

Max Marks: 70

PART-A

Answer any Three questions Part-A

[3 X 14 = 42 M]

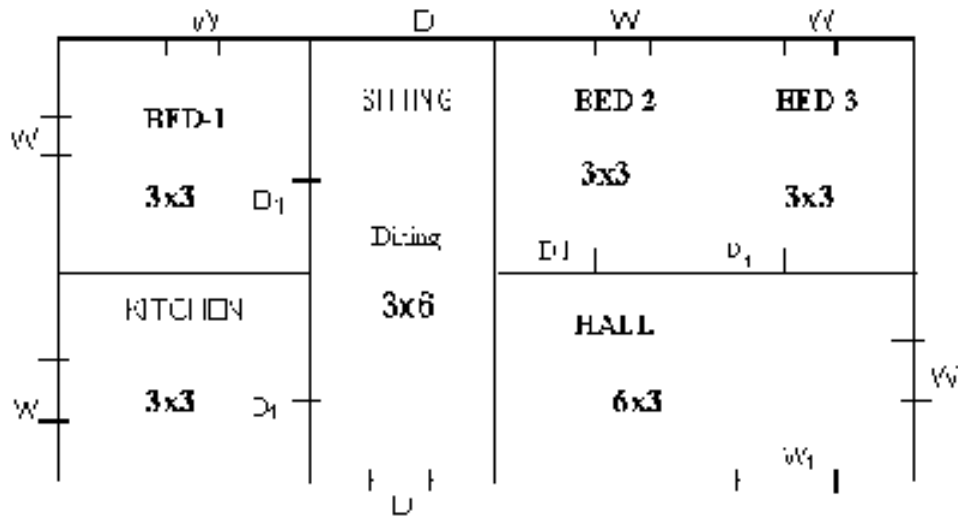
1. a) Explain the phenomenon to calculate the total number of floors by a building by using the factor FAR [5M]
b) Write explanatory notes on i) Open space requirements ii) Lighting and ventilation requirements [9M]
2. a) Write explanatory notes on i) building line ii) sanitary convenience [5 M]
b) Explain the requirements of a residential building to accommodate a small family? [9M]
3. A primary health centre is to be considered in a village . The site measuring 75m X 40 m with frontage along NS direction .The wind direction is South- South East . Draw the line diagram of the building to accommodate i) Waiting room ii) Examination Room and iii) Verandah. [14M]
4. a) List out the the different stages involved in construction planning ? Explain in detail. [7M]
b) Briefly explain the procedure involved in critical path identification with an Example [7 M]
5. a) What are the factors to be considered in the design of Bank building? [7M]
b) What are the planning factors in the design of dispensary [7M]

PART-B

Answer any **one** question Part-B

[1x28=28M]

6. (a) Draw the elevation and plan of one and a half brick in English bond [8M]
(b) Draw the plan and elevation of the given line diagram? [20M]

**REFERENCE:-**

D-1000X2000 mm, D₁-900X2000 mm, W-900X1200 mm, W₁-2000X1000 mm,
V-800X300 mm, All dimensions of rooms are in m

7 a) Draw the sign conventions

i) Brick ii) Stone iii) Sand filling iv) Zinc v) Timber vi) Lead

[9 M]

b) Draw the king post truss for an effective span of 7.5 m . Draw all the details

[19 M]

CODE: 13EE3014**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015****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) On what factors does the skin effect depend?
 - b) Mention the advantages of bundled conductors.
 - c) What is the difference between lumped and distributed elements?
 - d) Write the A B C D constants for a short transmission line.
 - e) How do you enhance the surge impedance loading of a line?
 - f) The surge impedance of a 100 km long line is 400 ohm. What is its value for a 75 km long line?
 - g) List the effects of transients in power system.
 - h) What are the disadvantages and advantage of corona?
 - i) Why the potential across various identical units in a string of suspension insulators is different?
 - j) How many individual strands does a stranded conductor with 3 layers consist of?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2.
 - (a) Deduce an expression for the inductance per phase of an unsymmetrically spaced but fully transposed 3-phase transmission line from the fundamentals.
 - (b) Determine the capacitance and charging current per unit length of a 3- ϕ , 50Hz, 132 kV transmission line when the conductors are placed in a horizontal plane separated by 3 m distance. The diameter of each conductor is 20mm. Assume that the line is completely transposed.

(OR)

3.
 - (a) Derive an expression for the capacitance to neutral of a 1-phase line taking ground into consideration.
 - (b) The 3 conductors of a 3- ϕ , 50Hz line are arranged in a horizontal plane and are "D" m apart. The line reactance is 0.5 ohm/km and the conductor GMR = 2 cm. Determine the spacing "D", if the line is completely transposed.

UNIT-II

4.
 - (a) Find the equivalent A B C D constants of two transmission lines when they are connected in tandem.
 - (b) A 3- ϕ , 50Hz short transmission line delivers a load of 2400 KW at a power factor of 0.8 lagging and at 11kV over a distance of 20Km. The line conductors are placed at the corners of an equilateral triangle of 2m side. The line losses are 10%. Calculate the sending end power factor. Specific resistance of the conductor material is $1.73 \mu\Omega\text{-cm}$.

(OR)

- 5 (a) Derive the generalized network constants of a medium transmission line and draw the phasor diagram assuming nominal- π configuration.
- (b) A 15 km long 3 phase transmission line delivers 5MW at 11 kV at a power factor of 0.8 lag. Line loss is 12% of the power delivered and the line inductance is 1.1 mH/km/ph. Calculate the value of capacitor to be connected at the receiving end to reduce the regulation to zero.

UNIT-III

- 6 (a) Define characteristic impedance of a transmission line. Show that it is given by $Z_c = (Z_{oc} * Z_{sc})^{1/2}$, where Z_{oc} and Z_{sc} are the impedances measured at the sending end with receiving end open circuited and short circuited respectively.
- (b) A 3- ϕ , 50Hz transmission line is 280 km long. It has a total series impedance of $35 + j*140$ ohm and a shunt admittance of $930 * 10^{-6}$ mho. It delivers 40 MW at 220 kV with 90% power factor lagging. Find the transmission efficiency using long line approximation.

(OR)

- 7 (a) Derive the A B C D constants of a long transmission line represented by equivalent-T model.
- (b) The conductors of a single circuit 132kV, 50Hz 3- ϕ line are placed at the vertices of a triangle having sides of 370cm, 550cm and 825cm. The diameter of the conductor is 2.5cm. Assuming regular transposition and neglecting the effect of earth, calculate the surge impedance loading of the line.

UNIT-IV

- 8 (a) Explain the variation of current and voltage on an overhead line when one end of the line is open circuited and at the other end a source of constant emfV is switched in.
- (b) An overhead line with surge impedance of 500 ohm and an effective resistance of 6ohm/km. If the surge of 400 kV enters the line at a certain point, calculate the magnitude of this surge after it has traversed 100km and also calculate the power loss over this distance.

(OR)

- 9 (a) Derive the expression for critical disruptive and visual disruptive voltages associated with corona.
- (b) A 3- ϕ , 50Hz, 132 kV transmission line consists of conductors of 1.17 cm diameter and spaced equilaterally at a distance of 3 m. The line conductors have smooth surface with value for $m=0.96$. The barometric pressure is 72cm of Hg and temperature of 20⁰ C. Determine the fair and foul weather corona loss/ km/phase.

UNIT-V

- 10 (a) What are the various types of insulators used in power systems? How suspension insulators are advantageous than pin type insulators?
- (b) The self-capacitance of each unit in a string of 3 suspension units is C. The shunting capacitance to earth is 0.25C and capacitance between link pin and guard ring is 0.15C. Find the percentage voltage distribution and string efficiency.

(OR)

- 11 (a) Obtain an expression for the sag and the length of the line when the line is suspended between two supports of the same height.
- (b) An overhead line at a river crossing is supported from two towers at heights of 25m and 75m above water level. The horizontal distance between the towers is 250m. If the required clearance between the conductor and water at a point midway between the towers is 45m and if both the towers are on the same side of the point of maximum sag of the parabolic configuration, find the stringing tension in the conductor. The weight of the conductor is 0.7 kg/m.

AR13

CODE: 13ME3013

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

DYNAMICS OF MACHINERY
(MECHANICAL ENGINEERING)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 X 10 = 10 M]

1. a) Draw the turning moment diagram of a 4-cylinder engine.
b) Define co-efficient of fluctuation of energy of a flywheel.
c) Write an expression for speed of a porter governor considering friction at the sleeve.
d) Define hunting of governor.
e) What is the efficiency of screw jack for self locking?
f) Write an application of shoe brakes in automobiles.
g) Differentiate between static balancing and dynamic balancing of shafts.
h) What is the angle at which hammer blow is maximum.
i) What is the damping factor for critically damped system?
j) Write an expression for logarithmic decrement.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. A three cylinder single acting engine has its cranks set equally at 120° and it runs at 600 r.p.m. The torque-crank angle diagram for each cycle is a triangle for the power stroke with a maximum torque of 90 N-m at 60° from dead centre of corresponding crank. The torque on the return stroke is sensibly zero. Determine : 1. power developed. 2. coefficient of fluctuation of speed, if the mass of the flywheel is 12 kg and has a radius of gyration of 80 mm, 3. coefficient of fluctuation of energy, and 4. maximum angular acceleration of the flywheel.

(OR)

3. A certain machine requires a torque of $(5000 + 500 \sin \theta)$ 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 $(5000 + 600 \sin 2 \theta)$ N-m. The flywheel and the other rotating parts attached to an 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.

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UNIT-II

4. In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40° , find, taking friction into account, range of speed of the governor.

(OR)

5. A four-wheeled trolley car of mass 2500 kg runs on rails, which are 1.5 m apart and travels around a curve of 30 m radius at 24 km / hr. The rails are at the same level. Each wheel of the trolley is 0.75 m in diameter and each of the two axles is driven by a motor running in a direction opposite to that of the wheels at a speed of five times the speed of rotation of the wheels. The moment of inertia of each axle with gear and wheels is 18 kg-m^2 . Each motor with shaft and gear pinion has a moment of inertia of 12 kg-m^2 . The centre of gravity of the car is 0.9 m above the rail level. Determine the vertical force exerted by each wheel on the rails taking into consideration the centrifugal and gyroscopic effects. State the centrifugal and gyroscopic effects on the trolley.

UNIT-III

6. A dry single plate clutch is to be designed for an automotive vehicle whose engine is rated to give 100 kW at 2400 r.p.m. and maximum torque 500 N-m. The outer radius of friction plate is 25% more than the inner radius. The intensity of pressure between the plate is not to exceed 0.07 N/mm^2 . The coefficient of friction may be assumed equal to 0.3. The helical springs required by this clutch to provide axial force necessary to engage the clutch are eight. If each spring has stiffness equal to 40 N /mm, determine the initial compression in the springs and dimensions of the friction plate.

(OR)

7. The mean diameter of the screw jack having pitch of 10 mm is 50 mm. A load of 20 KN is lifted through a distance of 170 mm. Find the work done in lifting the load and efficiency of the screw jack when
1. the load rotates with the screw, and
 2. the load rests on the loose head which does not rotate with the screw.
- The external and internal diameters of the bearing surface of the loose head are 60 mm and 10 mm respectively. The coefficient of friction for the screw as well as the bearing surface may be taken as 0.08.

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UNIT-IV

8. A rotor has the following properties :

Mass	Magnitude (Kg)	Radius(mm)	Angle	Axial Distance from 1 st mass (mm)
1	9	100	0	--
2	7	120	60	160
3	8	140	135	320
4	6	120	270	560

If the shaft is balanced by two counter masses located at 100 mm radii & revolving in the plane midway of planes 1&2 and midway of 3 &4. Determine the magnitude of the masses and their respective angular positions.

(OR)

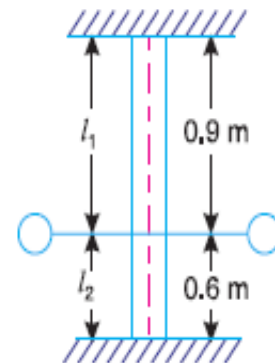
9. An inside cylinder locomotive has its cylinder centre lines 0.7 m apart and has a stroke of 0.6 m. The rotating masses per cylinder are equivalent to 150 kg at the crank pin, and the reciprocating masses per cylinder to 180 kg. The wheel centre lines are 1.5 m apart. The cranks are at right angles. The whole of the rotating and $\frac{2}{3}$ of the reciprocating masses are to be balanced by masses placed at a radius of 0.6 m. Find the magnitude and direction of the balancing masses. Find the fluctuation in rail pressure under one wheel, variation of tractive effort and the magnitude of swaying couple at a crank speed of 300 r.p.m.

UNIT-V

10. a) Discuss briefly with the neat sketches the longitudinal, transverse, and torsional vibrations. [5 M]
b) A shaft 1.5m long supported in flexible bearings at the ends carries two wheels each of 50 Kg mass. One wheel is situated at the center of the shaft and the other at a distance of 375 mm from the center towards left. The shaft is hollow having external diameter 75 mm and internal diameter 40 mm. The density of the shaft material is 7700 Kg/m^3 and its modulus of elasticity is 200 GN/m^2 . Find the lowest whirling speed of the shaft, taking into account the mass of the shaft. [7 M]

(OR)

11. a) Derive an expression for frequency of torsional vibrations for a shaft fixed at one end and carrying a load on the free end. [5M]
b) A Flywheel is mounted on a vertical shaft as shown in fig. The both ends of a shaft are fixed and its diameter is 50 mm. The flywheel has a mass of 500 Kg and its radius of gyration is 0.5m. Find the natural frequency of torsional vibrations, if the modulus of rigidity for the shaft material is 80 N/m^2 . [7 M]



Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 X 10 = 10 M]

1.
 - a) What is the Disadvantage of cascading differential Amplifiers Stages
 - b) Open Loop Op-Amps are not Preferred Why?
 - c) Should the value of Slew Rate of an Op-Amp be High or Low? Explain
 - d) What is Temperature Range of An Op-Amp which is Produced for Commercial Purpose
 - e) Draw the Circuit Diagram of a Buffer
 - f) What are the applications of Log and Antilog Amplifier
 - g) _____ Filter allows only High Frequencies and Rejects Lower Frequencies
 - h) Calculate the Resolution of an 8 Bit DAC which has a Output Voltage Range of 0-5 V
 - i) What is the Importance of 5th Pin in 555 Timer
 - j) Define Lock Range

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - (a) Explain the Operation of Differential Amplifier with Swamping Resistor. [6M]
 - (b) Explain the Operation of Emitter Follower with Constant Current Bias? [6M]

(OR)

3. Derive the Expressions for V_{CEQ} , I_{CQ} , Voltage Gain, Z_i , Z_o for an dual input, balanced output differential amplifiers. [12M]

UNIT-II

4.
 - (a) Assume Op-Amp in the circuit are ideal then find the Output Voltage for the Circuit shown in figure -1 [6 M]

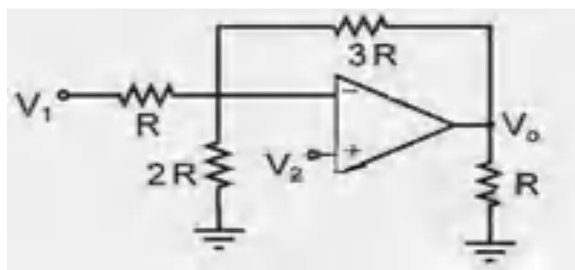


Figure-1

- (b) Define Input Offset Current and Explain How it can be Reduced [6 M]

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(OR)

- 5 (a) Explain about the best External Frequency Compensation Technique [6M]
(b) Explain the characteristics of an Ideal Op-Amp [6M]

UNIT-III

- 6 (a) Draw and Explain the Operation of Ideal Differentiator? What are the Disadvantages of Ideal Differentiator? How are these disadvantages overcome in Practical Differentiator [8M]
(b) Design a Square Wave Generator which generates a Square Wave at Frequency 1 KHz using Op-Amp. Assume Necessary Data [4M]

(OR)

- 7 (a) Design an adder Circuit using an Op-Amp to get the Output Expression $V_0 = -(0.4V_1 + V_2 + 4V_3)$ [5 M]
(b) Explain the working of Op-amp Schmitt Trigger with neat diagram and output waveforms. [7 M]

UNIT-IV

- 8 (a) Design an Wide Band Pass Filter using Op-Amp with $f_L=300$ Hz and $f_H=2$ KHz and a Passband gain=4 [6 M]
(b) Explain about DAC 1408?What are the advantages of that IC [6 M]
- (OR)
- 9 (a) Explain in detail about Dual Slope ADC. [7 M]
(b) Calculate the values of the LSB,MSB and Full Scale Output for an 8-Bit DAC for 0 to 12 V Range [5 M]

UNIT-V

- 10 (a) Design an Astable Multivibrator using 555 Timer at 2 KHz with a Duty cycle of 68% [7 M]
(b) Explain how Frequency Translation can be done using PLL [5 M]
- (OR)
- 11 (a) Explain how Frequency Multiplication can be done using PLL [5 M]
(b) Explain the Operation of Linear Ramp Generator using 555 Timer [7 M]

AR13

CODE: 13HS3006

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

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) What are the functions of Management?
b) Highlight the important social responsibilities of Management.
c) How one can understand Sole Proprietorship.
d) List out various types of Capital.
e) Define Elasticity of Demand?
f) Discuss the factors governing demand forecasting.
g) What is Iso-Costs?
h) What is BEA?
i) What is Monopolistic Competition?
j) Classify the different types of Pricing Strategies.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. Describe in detail the Mayo's Hawthorne experiments. [12M]
(OR)
3. Explain the following.
(a) Leadership Styles. [6M]
(b) Taylor's Scientific Management Theory. [6M]

UNIT-II

4. What are the different types of Enterprises? Explain in detail. [12M]
(OR)
5. New co., is deciding between two machines (Machine A and Machine B) in order to add capacity to its existing plant. The company estimates the cash flows for each machine to be as follows: [12M]

	Expected after Cash Flows for the new machines	
YEAR	MACHINE- A	MACHINE- B
0	\$5000	\$2000
1	500	500
2	1000	1500
3	1000	1500
4	1500	1500
5	2500	1500

Calculate the payback period of the two machines using the above cash flows and decide which new machine New co should accept. Assume the maximum payback period the company establishes is five years.

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UNIT-III

- 6 (a) How Demand Determinants play a major role in the Demand Analysis. [6M]
Explain
(b) Discuss Various Factors governing Demand Forecasting. [6M]
(OR)
7 Explain in-detail the Judgmental approach to Demand Forecasting. [12M]

UNIT-IV

- 8 Discuss the internal and external economics of scale in detail. [12M]
(OR)
9 Briefly explain the following
(a) MRTS [6M]
(b) Break Even Point with Suitable Example [6M]

UNIT-V

- 10 Discuss in-detail the features of perfect competition. [12M]
(OR)
11 Explain the following
(a) Determination of Price Output in monopoly [6M]
(b) Types of Competition [6M]