AR16

CODE: 16CE3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2019

STRUCTURAL ANALYSIS – II

(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. A three hinged parabolic arch, hinged at the crown and springs ha horizontal span of 12m and central rise of 2.5m. It carries a UDL of 30kN/m over the left hand half of the span. Calculate the reactions at the hinges, also calculate the values of the normal thrust, SF and BM at 1.5m, 3m, 7.5m from left end. 14M

(OR)

2. A two hinged circular segmental arch of span 80 m and rise 10 m carries a point load 100 kN at a distance of 20 m from left support together with a UDL 40 kN/m over the right half of the span. Determine the reactions at the supports and also find the internal forces at 20 m from the right support. 14M

UNIT-II

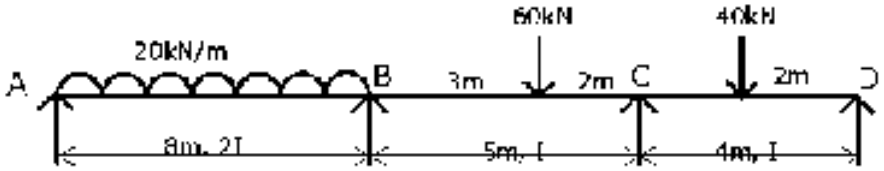
3. Four point loads 8 kN, 15kN, 15 kN and 10 kN have center to center spacing of 2m between consecutive loads and they traverse a girder of 30m span from left to right with 10kN load leading. Calculate the maximum bending moment and shear force at 8 m from the left support. 14M

(OR)

4. a) Distinguish between influence line diagram and bending moment diagram. 4M
   b) A uniformly distributed load (udl) of 35 kN/m of 5 m length crosses a girder of span 40 m, from left to right. With the help of influence lines, determine the values of shear force and bending moment at 16 m from left support, when the head of the udl is at 22 m from left the support. Also calculate absolute maximum bending moment. 10M

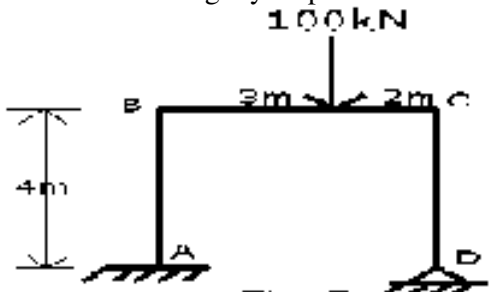
UNIT-III

5. Analyse the continuous beam shown in fig. by Moment Distribution Method. Draw BMD. 14M



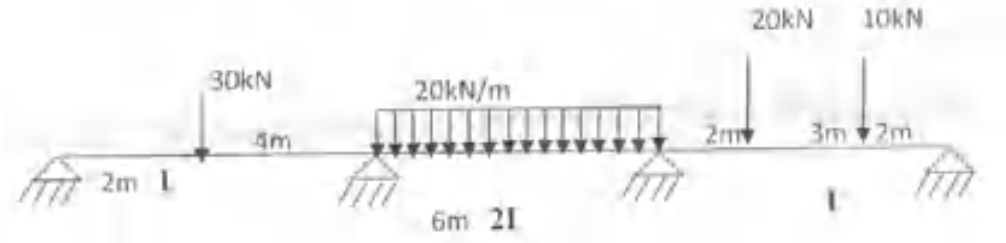
(OR)

6. Analyse the portal frame shown in fig. by slope deflection method. Draw BMD. 14M



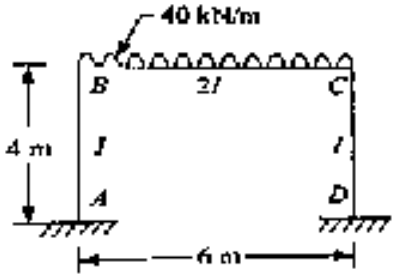
UNIT-IV

7. Analyze the continuous beam shown in figure by Kani's method and also draw the bending moment and shear force diagram. 14M



(OR)

8. Analyze the portal frame shown in figure by Kani's method. Draw the bending moment diagram. 14M

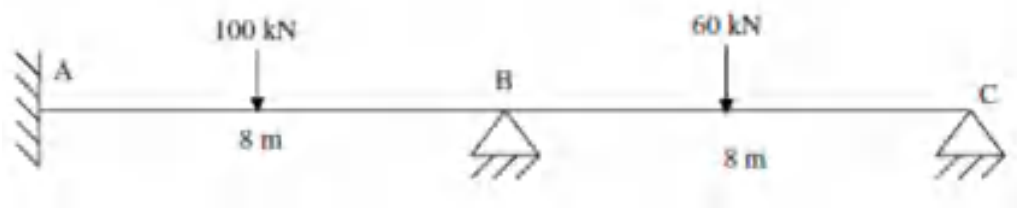


UNIT-V

9. A two span continuous beam ABC has the end A on roller supports and the end C a fixed end. The span AB is of length 4 m carries a central concentrated load of 100 kN. The span BC is 6m and carries a distributed load of 60 kN/m. Analyze the beam by stiffness method. 14M

(OR)

10. Analyze the beam as shown in figure by stiffness method. 14M



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AR16

CODE: 16EE3015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2019

ELECTRICAL MEASUREMENTS

(Electrical and Electronics Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) A 1 mA full scale permanent magnet moving coil meter with a coil resistance of 100 Ω is to be converted into (i) 0-1 A dc ammeter and (ii) 0-30 V dc voltmeter by connecting external series/parallel resistances. Show the connections and find out the values of the external resistances in each case. 8M
   b) What is the difference between MI and MC instruments. 6M

(OR)

2. a) The coil of a moving coil voltmeter is 40 mm long and 30 mm wide and has 100 turns on it. The control spring exerts a torque of 240 x 10-6 N-m when the deflection is 100 divisions on full scale. If the flux density of the magnetic filed in the air gap is 1.0 weber/m2 , estimate the resistance that must be put in series with the coil to give one volt per division. The resistance of the voltmeter coil may be neglected 6M
   b) With neat figure, explain the construction and operation of attraction type moving Iron instrument and derive an expression for the deflecting torque. Give the advantages of such instruments. 8M

UNIT-II

3. a) Explain in detail about dynamometer type wattmeter. 10M
   b) Explain the meaning of the term "Burden" in the instrument transformer. 4M

(OR)

4. a) A single turn 1000/5A, 50 Hz current transformer has a non-inductive burden of 1 ohm.The magnetizing current is 100 A. Calculate the current ratio error and Phase Angle error. 7M
   b) Explain the procedure to measure power using instrument transformers with the help of phasor diagrams and correction factors? 7M

UNIT-III

5. a) Explain how the following adjustments are made in a single phase induction type Energy meter. 7M
   i) Lag adjustment
   ii) Adjustment for friction compensation
   iii) Creeping
   iv) Over load compensation
   v) Temperature compensation

   b) The disc of an energy meter makes 100 revolutions per unit of energy. When a 1000 watt load is connected, the disc rotates at 12 rpm. If the load is on for 10 hours, how many units are recorded as error? 7M

(OR)

6. a) Describe the construction and working of two element Induction type energy meter. 10M

   b) What is creeping how it is prevented in energy meter? 4M

UNIT-IV

7. a) Explain the working of carey foster slide-wire bridge. 7M

   b) Explain how Wien's bridge used for frequency and derive expression for frequency in terms of bridge parameters. 7M

(OR)

8. a) Derive the expression for bridge sensitivity for Wheatstone bridge with equal arms. 7M

   b) Derive the balance equation for Hay's bridge and draw phasor diagram. 7M

UNIT-V

9. a) Describe the Lloyd Fisher square for measurement of iron losses in a specimen of laminations. 7M

   b) Explain the construction and working of a dry sdale polar type Potentiometer. 7M

(OR)

10. Determine the B.H curve of ring specimens by 14M
    a) Step by step b) Method of reversals

AR16

CODE: 16ME3014 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2019

KINEMATICS & DYNAMICS OF MACHINERY
(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the classification of kinematic pairs with neat sketches? 8M
   b) Explain any two inversions of single slider crank chain with neat sketches? 6M

(OR)

2. a) Explain hart mechanism and prove that it transmits exact straight line mechanism? 7M
   b) Explain the inversions of four bar cycle chain with neat diagrams? 7M

UNIT-II

3. a) Explain the construction of velocity diagram of slider crank mechanism by using Klien's construction? 6M
   b) Locate all the instantaneous centres for a four bar mechanism as shown in Fig. 1 8M
   The lengths of various links are : AD = 125 mm ; AB = 62.5 mm ; BC = CD = 75 mm. If the link AB rotates at a uniform speed of 10 r.p.m. in the clockwise direction, find the angular velocity of the links BC and CD.

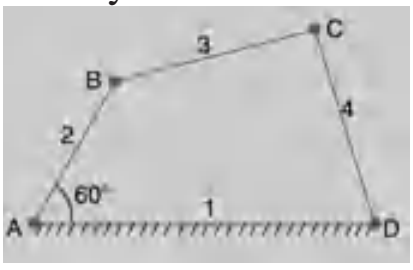

Fig.1

(OR)

4. a) Explain different types Instantaneous centers with an example? 4M

b) The dimensions of the various links of a mechanism, as shown in Fig. 2, are as Follows AB = 30 mm ; BC = 80 mm ; CD = 45 mm ; and CE = 120 mm. The crank AB rotates uniformly in the clockwise direction at 120 r.p.m. Draw the velocity diagram for the given configuration of the mechanism and determine the velocity of the slider E and angular velocities of the links BC, CD and CE. 10M

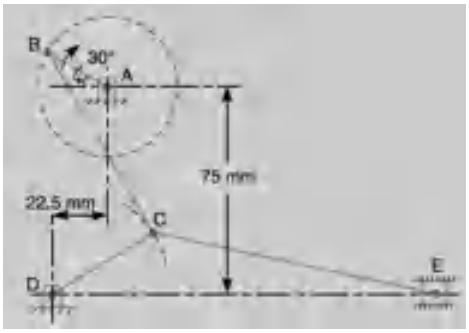

Fig 2

UNIT-III

5. a) Derive Velocity and Acceleration of the Piston using analytical method. 7M

b) A rear engine automobile is travelling along a track of 100 metres mean radius. Each of the four road wheels has a moment of inertia of 2.5 kg-m2 and an effective diameter of 0.6 m. The rotating parts of the engine have a moment of inertia of 1.2 kg-m2. The engine axis is parallel to the rear axle and the crankshaft rotates in the same sense as the road wheels. The ratio of engine speed to back axle speed is 3 : 1. The automobile has a mass of 1600 kg and has its centre of gravity 0.5 m above road level. The width of the track of the vehicle is 1.5 m. Determine the limiting speed of the vehicle around the curve for all four wheels to maintain contact with the road surface. Assume that the road surface is not cambered and centre of gravity of the automobile lies centrally with respect to the four wheels. 7M

(OR)

6. a) Explain dynamically equivalent system? 6M

b) An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 km per hour. The rotary engine and the propeller of the plane has a mass of 400 kg with a radius of gyration of 300 mm. The engine runs at 2400 r.p.m. clockwise, when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it. What will be the effect, if the aeroplane turns to its right instead of to the left ? 8M

UNIT-IV

7. a) What are the advantages of cycloidal and involute teethes? 6M

b) In an epicyclic gear of the 'sun and planet' type shown in Fig. 3, the pitch circle diameter of the internally toothed ring is to be 224 mm and the module 4 mm. When the ring D is stationary, the spider A, which carries three planet wheels C of equal size, is to make one revolution in the same sense as the sun wheel B for every five revolutions of the driving spindle carrying the sun wheel B. Determine suitable numbers of teeth for all the wheels. 8M

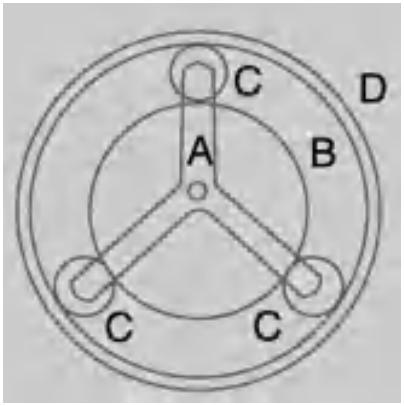

Fig 3

(OR)

8. a) Derive the train value of Reverted gear train with neat sketch? 6M

b) A pair of gears, having 40 and 20 teeth respectively, are rotating in mesh, the speed of the smaller being 2000 r.p.m. Determine the velocity of sliding between the gear teeth faces at the point of engagement, at the pitch point, and at the point of disengagement if the smaller gear is the driver. Assume that the gear teeth are 20° involute form, addendum length is 5 mm and the module is 5 mm. Also find the angle through which the pinion turns while any pairs of teeth are in contact. 8M

UNIT-V

9. a) Derive the energy stored in a flywheel? 6M

b) A governor of the Hartnell type has equal balls of mass 3 kg, set initially at a radius of 200 mm. The arms of the bell crank lever are 110 mm vertically and 150 mm horizontally. Find : 1. the initial compressive force on the spring, if the speed for an initial ball radius of 200 mm is 240 r.p.m. ; and 2. the stiffness of the spring required to permit a sleeve movement of 4 mm on a fluctuation of 7.5 per cent in the engine speed. 8M

(OR)

10. a) Derive the expression for the mean speed of a porter governor? 7M

b) A single cylinder, single acting, four stroke gas engine develops 20 kW at 300 r.p.m. The work done by the gases during the expansion stroke is three times the work done on the gases during the compression stroke, the work done during the suction and exhaust strokes being negligible. If the total fluctuation of speed is not to exceed ± 2 per cent of the mean speed and the turning moment diagram during compression and expansion is assumed to be triangular in shape, find the moment of inertia of the flywheel. 7M

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AR16

CODE: 16EC3014 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2019
LINEAR IC APPLICATIONS
(Electronics and Communication Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Analyze the dual input, balanced output configuration of differential amplifier Using DC. 7M
   b) With neat figure Explain the concept of Level Translator in detail. 7M

(OR)

2. a) Explain the AC analysis of single input, unbalanced output differential amplifier 7M
   b) Briefly explain the various types of IC packages. Mention the criteria for selecting an IC package. 7M

UNIT-II

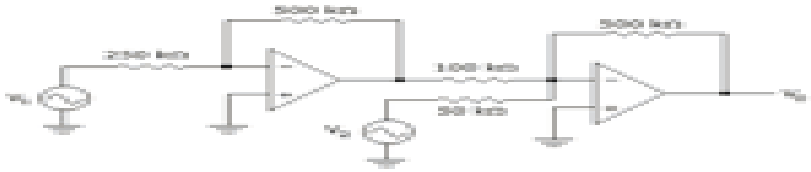
3. a) Draw the generalized block diagram for the operational amplifier. Explain each block in detail. 6M
   b) Explain the terms (i) Input Offset voltage (ii) CMRR (iii) PSRR (iv) Input Bias current. 8M

(OR)

4. a) What is the need for Frequency Compensation in Op-Amp and explain about Pole-Zero Frequency Compensation Technique. 8M
   b) Define slew rate. What causes it? Derive the expression for slew rate of an op-amp. If I_{CQ} = 15μA and C = 35 pF and peak value of input is 12V, determine slew rate. 6M

UNIT-III

5. a) Find the output voltage V_o in the following circuit, where V_1=2 V, V_2=1 V. 5M



b) Explain the working of a Square wave generator using Op-Amp and draw the wave forms. 9M

(OR)

6. a) Design an Op-Amp differentiator that will differentiate an input signal with f_{max} = 200 Hz. 6M

b) Draw the block diagram of Sample & Hold amplifier and explain its operation in Detail. 8M

UNIT-IV

7. a) Explain the operation of RC Phase Shift oscillator with a neat schematic diagram and derive the expression for frequency of oscillations 10M

b) Calculate the values of the LSB, MSB and full scale output for a 9-bit DAC for the 0 to 12V. 4M

(OR)

8. a) Describe the operation of Successive Approximation type Analog to Digital Converter. 9M

b) Design a first order Low pass filter using Op-Amp with cut off frequency of 3 KHz. Assume pass band gain is 3. 5M

UNIT-V

9. a) Draw the block diagram of Monostable multivibrator using 555 Timer and derive an expression for its frequency of oscillation. 8M

b) List the types of regulators? Explain adjustable types of voltage regulators. 6M

(OR)

10. a) What is VCO, draw and explain the functional block diagram of VCO. 9M

b) Explain any two applications of 555 timer as an Astable Multivibrator. 5M

AR16

CODE: 16CS3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2019

COMPUTER NETWORKS

(Common to CSE & IT)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the different network categories	7M
	b)	Explain the concept of layered architecture	7M
		(OR)	
2.	a)	Draw the hierarchical structure of OSI model and explain the functionality of each layer	7M
	b)	Describe the concept addressing with respective layers.	7M

UNIT-II

3.	a)	Compute the CRC for110100101 with divisor 1010	7M
	b)	Explain the concept of stop & wait protocol in noisy and noiseless environment	7M
		(OR)	
4.	a)	Explain the dynamic channel allocation assumptions in detail	7M
	b)	Explain the concept of CSMA/CD with flow chart	7M

UNIT-III

5.	a)	Explain the design issues of network layer	7M
	b)	Explain the concept of broad cast and multi cast routing in networks	7M
		(OR)	
6.	a)	Define congestion and explain different congestion prevention policies	7M
	b)	Explain the header format of IPV6	7M

UNIT-IV

7.	a)	Explain the TCP header format	7M
	b)	Explain the transmission policy of TCP	7M
		(OR)	
8.	a)	Describe the flow control in Transport layer	7M
	b)	Describe the concept of three way handshaking in TCP	7M

UNIT-V

9.	a)	Explain the architecture of SNMP	7M
	b)	Describe the concept of DNS	7M
		(OR)	
10.	a)	Explain the architecture of WWW	7M
	b)	Describe about HTTP	7M

AR13

13CE3014 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2019
STRUCTURAL ANALYSIS-II
(Civil Engineering)

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

PART-A

ANSWER ALL QUESTIONS **[1X10=10 M]**

1. a) What is the basis for assuming points of contra-flexure at the mid-points of (i) beams and (ii) columns in multi-storied laterally loaded frames? In what situations are these assumptions perfectly valid?
   b) Write the equation to find horizontal thrust in a two hinged parabolic arch.
   c) Write down the general slope-deflection equations and state what each term represents?
   d) What do you understand by static indeterminacy?
   e) What is the basic difference between the stiffness and flexibility method?
   f) What is stiffness coefficient for a cantilever beam under load *P* at its free end?
   g) Define distribution factor.
   h) What is meant by RF?
   i) Define Sway
   j) Write the Fixed end moment for fixed beam with uniformly distributed load throughout the span.

PART-B

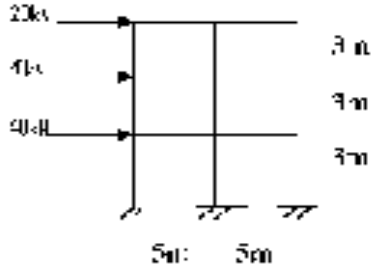
Answer one question from each unit **[5X12=60 M]**

UNIT-I

2. A two hinged parabolic arch of span 40m and rise 6m carries a point load of 120kN at a distance of 30m from the left end and uniformly distributed load of 30kN/m in the left portion from 0 to 20m. determine the i) Horizontal thrust ii) maximum positive and negative moments and iii) shear force and normal thrust at 10m from the left support.

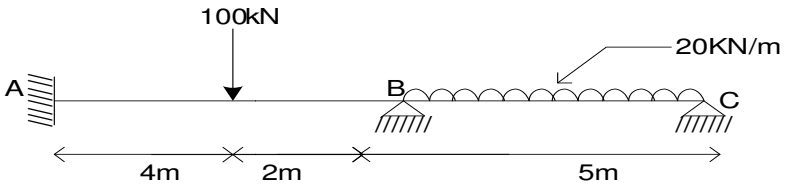
(OR)

3. A framed structure is subjected to lateral loads as shown in Figure Analyze the Structure using portal method and sketch BMD:



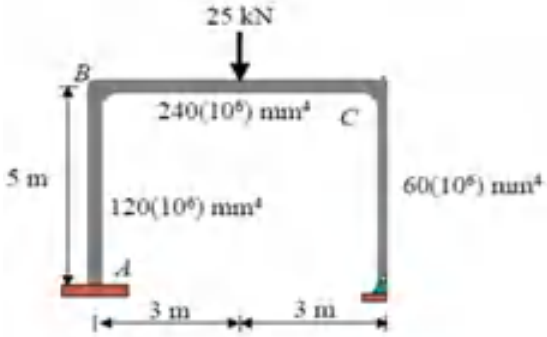
UNIT-II

4. Analyze two span continuous beam ABC as shown in figure, by slope deflection method. Then draw Bending moment & Shear force diagram. Take EI constant.



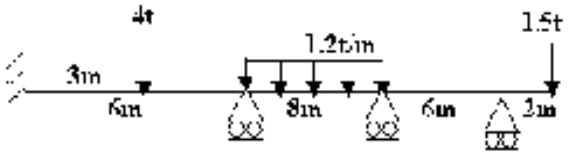
(OR)

5. Analyse the frame shown in fig. by slope deflection method. Draw the SFD and BMD.



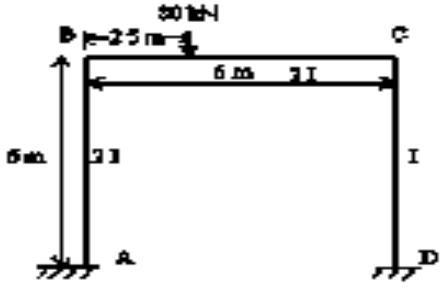
UNIT-III

6. Using the moment distribution method of analysis, find the support moments for the continuous beam shown in figure. EI is constants.



(OR)

7. Using the moment distribution method of analysis, determine the end moments of the members of the frame shown in figure. The relative value of EI for each member is indicated along the member.

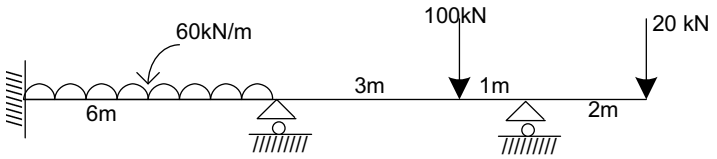


AR13

13CE3014 **SET-2**

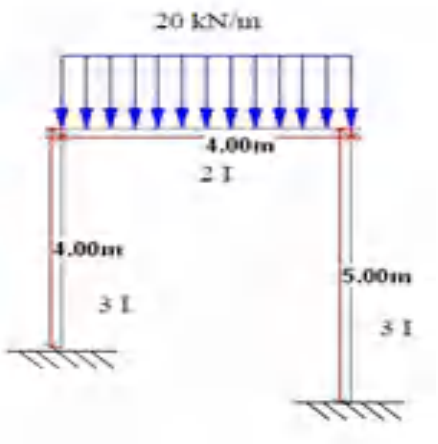
UNIT-IV

8. Analyze the continuous beam shown in fig. using flexibility method.



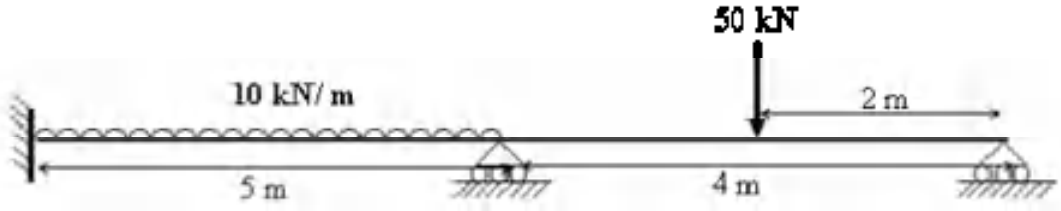
(OR)

9. Analyse the portal frame shown in fig by kani's method. Draw SFD and BMD.



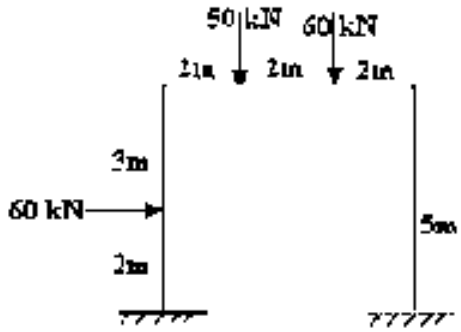
UNIT-V

10. Analyse the beam shown in Fig by stiffness method.



(OR)

11. Analyse the frame shown in fig by stiffness method.



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AR13

CODE: 13EE3016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2019

ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

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

PART-A

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

1. a) What are the different methods of producing controlling torque?
   b) How we can extend the range of a voltmeter?
   c) What is CT ratio?
   d) What will be the load power factor if the two wattmeters are reading equal values in two wattmeter method?
   e) What is meter constant of an energy meter?
   f) How we can avoid creeping in energy meter?
   g) List out different types of power factor meters.
   h) Which method is suitable for the measurement of resistance of good conductors of electricity
   i) The current coil of a wattmeter generally carries_____ current.
   j) List out the applications of a A.C.potentiometer.

PART-B

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

UNIT-I

2. Explain the working principle and operation of a repulsion type moving iron type instrument with a neat diagram 12M

(OR)

3. Explain the working principle and operation of PMMC instrument with a neat sketch 12M

UNIT-II

4. a) Explain the process of measuring reactive power in a three phase circuit. 6M
   b) What are the constructional differences between LPF and UPF wattmeters ? 6M

(OR)

5. a) Explain the construction and principle of operation of a dynamometer type wattmeter. 6M

b) Two wattmeters, which are connected to measure the total power in a three-phase system supplying a balanced load, read 10.5 KW and -2.5 KW respectively. Determine the total power and the power factor of the load 6M

UNIT-III

6. Explain the construction and principle of operation of single phase induction type energy meter. Derive the expression relating number of revolutions and energy. 12M

(OR)

7. a) Explain the construction and operation of a 1-φ electro dynamometer type power factor meter with a neat sketch 6M

b) A single phase energy meter makes 500 revolutions per Kwh. It is found on testing as making 40 revolutions in 58.1seconds at 5KW full load. Find out %error. 6M

UNIT-IV

8. a) Explain the measurement of capacitance using Schering's method 6M

b) Explain the measurement of low resistance using Kelvin's double bridge method. 6M

(OR)

9. a) How to measure the unknown value of inductance using Maxwell's inductance capacitance Bridge? 6M

b) Explain the measurement of high resistance using loss of charge method. 6M

UNIT-V

10. Explain the procedure of measurement of unknown resistance, current, voltage and calibration of a voltmeter using D.C. Crompton's potentiometer 12M

(OR)

11. Determine the B.H curve of ring specimen by i) step by step method ii) Method of reversals 12M

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AR13

CODE:13ME3013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, JANUARY, 2019
DYNAMICS OF MACHINERY
(Mechanical Engineering)

Time : 3 hours **Maximum Marks: 70**

PART - A

ANSWER ALL QUESTIONS **(1 X 10 = 10 M)**

1. a) Define the significance of inertia force analysis.
   b) What are turning-moment diagrams? Why are they drawn?
   c) Name the governor where isochronism is achieved.
   d) What is meant by reactive gyroscopic couple.
   e) Write a relation for the frictional torque acting on a centrifugal clutch.
   f) What are different types of brakes.
   g) What do you mean by balancing? Why it is necessary for high speed engines.
   h) What is the major difference between static and dynamic balancing.
   i) What is meant by resonance.
   j) Define transmissibility ratio in vibrating systems.

PART – B

Answer one question from each unit **(5 X 12 = 60 M)**

UNIT-I

2. The crank and connecting rod of a vertical single cylinder gas engine running at 1800 rpm are 60 mm and 240 mm respectively. The diameter of the piston is 80 mm and the mass of the reciprocating parts is 1.2 kg. At a point during the power stroke when the piston has moved 20 mm from the top dead center position, the pressure on the piston is 800 kN/m^2. Determine
   (i) Net force on the piston
   (ii) Thrust in the connecting rod
   (iii) Thrust on the sides of cylinder walls
   (iv) Engine speed at which the above values are zero.

(OR)

3. The turning moment diagram for a four stroke gas engine may be assumed for simplicity to be represented by triangles, the areas of Compression stroke = 1.7×10^{-3} m^2 and Expansion stroke = 6.8×10^{-3} m^2 from the line of zero pressure. Each m^2 of area represents 3 MN-m of energy. Assuming the resisting torque to be uniform and neglect the areas of suction and exhaust stroke, find the mass of the rim of a flywheel required to keep the speed between 202 and 198 r.p.m. The mean radius of the rim is 1.2 m.

UNIT- II

4. In a porter governor, each of the four arms is 400mm long. The upper arms pivoted on the axis of the sleeve, whereas the lower arms are attached to the sleeve at a distance of 45 mm from the axis of rotation. Each ball has a mass of 8kg and the load on the sleeve is 60 kg. What will be the equilibrium speeds for the two extreme radii of 250 mm and 300 mm of rotation of the governor balls?

(OR)

5. An air craft consists of a propeller. It also consists of engine and propeller of mass moment of inertia 150 Kg m^2. The engine rotates at 3600 r.p.m. in a sense clockwise looking from rear. The air craft completes half circle of radius 100 m towards left when flying at 360 Kmph. Determine the gyroscopic couple on the air-craft and state its effect. Also state the effects of gyroscopic couple when plane takes right turn. If the sense is anticlockwise looking from rear, state the effects when aircraft takes left and right turns.

UNIT-III

6. A differential band brake has a drum with a diameter of 800 mm. The two ends of the band are fixed to the pins on the opposite sides of fulcrum of the lever at distances of 40 mm and 200 mm from the fulcrum. The angle of contact is 270^0 and the coefficient of friction is 0.2. Determine the brake torque when the force of 600 N is applied to the lever at a distance of 800 mm from the fulcrum.

(OR)

7. A cone clutch with a semi-cone angle of 15^0 transmits 10 kW at 600 rpm. The normal pressure intensity between the surfaces in contact is not to exceed 100 kN/m^2. The width of the friction surfaces is half of the mean diameter. Assume $\mu = 0.25$. Determine the (i) outer and inner diameters of the plate. (ii) width of the cone surface (iii) axial force to engage the clutch.

UNIT-IV

8. Four masses A, B, C, and D are completely balanced. Masses C and D make angles of 90^0 and 195^0 respectively with that of mass B in the counter clockwise direction. The rotating masses have following properties: m_b=25 kg, m_c=40 kg, m_d=35 kg, r_a=150 mm, r_b=200 mm, r_c=100 mm, r_d=180 mm plane B and C are 250 mm apart. Determine i)The mass A and its angular position with that of mass B ii). The positions of all the planes relative to plane of mass A.

(OR)

9. The following data refers to a two cylinder uncoupled locomotive:
   Rotating mass for cylinder = 280 kg, Reciprocating mass per cylinder = 300 kg, Distance between wheels = 1400 mm, Distance between cylinder center = 600 mm, Diameter of treads of driving wheels = 1800 mm, Crank radius = 300 mm, Radius of center of balance mass = 620 mm, Locomotive speed = 50 km/hr, Angle between cylinder crank = 90^0, Dead load on each wheel = 3.5 tonne. Determine i). The balancing mass required in the plane of driving wheels if whole of the revolving and two-third of the reciprocating mass are to be balanced. ii). the swaying couple, iii) the variation in the tractive force, iv). The maximum and minimum pressure on the rails, v). The maximum speed of the locomotive without lifting the wheels from the rails.

UNIT-V

10. A shaft of 50 mm diameter and 3 m long, is simply supported at its ends, carries three masses of 100 kg, 140 kg and 70 kg at 1.25 m, 2 m, and 2.5 m respectively from the left support. Taking E = 200 GN/m2, find the frequency of the transverse vibration using Dunkerley method.

(OR)

11. A single rotor of mass 7 kg is mounted midway between roller bearings on the steel shaft of 1 cm diameter. The bearing span is 40 cm. It is known that unbalance of the rotor is 0.175 kg – mm. If the system rotates at 1000 RPM find out the amplitude of vibration, the dynamic load transmitted to the bearings, when
    a. The shaft is vertically supported
    b. The shaft is horizontally supported

    Neglect the weight of the shaft and take modulus of elasticity E = 196 GPa

AR13

CODE: 13EC3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2019
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) What is meant by Differential Amplifier?
   b) Define Thermal Drift?
   c) List the ideal characteristics of op-amp.
   d) What are the commonly used external compensation techniques?
   e) Give the non-linear applications of op-amp?
   f) Draw the circuit diagram for log amplifier.
   g) Mention the limitations of counter type ADC?
   h) What are the advantages of active filters over passive filters?
   i) List the building blocks of a PLL.
   j) What is the function of RESET pin in IC555.

PART-B

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

UNIT-I

2. a) Describe the advantages of differential amplifiers and justify their applicability in op-amp with reference to stability and noise immunity? 6M
   b) Draw the small signal equivalent circuit of differential amplifier and obtain the expressions for common mode gain and differential mode gain? 6M

(OR)

3. a) Explain the properties of Dual Input Unbalanced Output Differential amplifier with relevant diagrams? 6M
   b) Explain the operation of level translator with relevant diagrams and expressions? 6M

UNIT-II

4. a) Draw the circuit diagram of Instrumentation Amplifier and explain its operation. Derive the expression for overall gain? 8M
   b) Compare the dominant pole and pole zero frequency compensation techniques. 4M

(OR)

5. a) Draw the block diagram of op-amp. Explain the operation of each block in detail. 8M
   b) Briefly explain the concept of virtual ground in op-amps. 4M

UNIT-III

6. a) Draw an op-amp summing amplifier circuit and obtain the expression for output voltage. 4M
   b) Draw the circuit of a voltage to current converter if the load is (i) floating and (ii) grounded and explain its operation? 8M

(OR)

7. a) Explain a comparator circuit using op-amp ? 4M
   b) Draw the diagram of anti-log amplifier and derive the expression for its output voltage? 8M

UNIT-IV

8. a) What is an all pass filter? Show that the magnitude response of the all pass filter is unity? 6M
   b) With help of suitable circuit diagram, explain the principle of operation single stage first order band pass filter. Derive the necessary expressions. 6M

(OR)

9. a) Explain the operation of successive approximation ADC? 8M
   b) Explain the important specifications of A/D converter. 4M

UNIT-V

10. a) Draw the circuit of monostable multivibrator using IC555. Explain its operation and derive an expression for pulse width. 6M
    b) How is an astable multivibrator using IC555 timer connected into a pulse position modulator and explains its operation? 6M

(OR)

11. a) Draw the block schematic of PLL and explain each block. 8M
    b) Explain how an FM wave is demodulated using IC565. 4M

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AR13

CODE: 13CS3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2019

COMPUTER NETWORKS
(Computer Science Engineering)

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

PART-A

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

1. a) Explain brief history of Internet.
   b) List any two differences between OSI and TCP/IP.
   c) Define HDLC.
   d) Explain Error control and Flow control.
   e) Describe services provided to the transport layer.
   f) What is meant by connection oriented service.
   g) Define TCP.
   h) Explain about buffering
   i) Define about the domain name system.
   j) Explain about Electronic Mail

PART-B

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

UNIT-I

2. a) Briefly describe about architecture of internet. (6M)
   b) Define network model. Describe in detail network models. (6M)

(OR)

3. a) Why OSI is a layered architecture explain in detail. (6M)
   b) Explain physical structures of Network. (6M)

UNIT-II

4. a) Explain about the GO-BACK-N sliding window protocol in detail (6M)
   b) Define framing. what are the design issues of Data link Layer. (6M)

(OR)

5. a) Describe in detail HDLC. (6M)
   b) Explain in detail LAN bridges. (6M)

UNIT-III

6. a) Define routing? How is Dijkstra's shortest path routing implemented? (6M)
   b) How congestion prevented in different layers? Explain. (6M)

(OR)

7. a) How do you implement broadcast routing? Explain. (6M)
   b) Define congestion? Explain the token bucket congestion control algorithm. (6M)

UNIT-IV

8. a) Describe briefly about the TCP transmission policy. (6M)
   b) Explain Transport service primitives. (6M)

(OR)

9. a) Explain how the congestion is controlled using TCP. (6M)
   b) Describe in detail about connection establishment and connection release. (6M)

UNIT-V

10. a) Explain briefly about the Hyper Text Transfer Protocol. (6M)
    b) Discuss Name server. (6M)

(OR)

11. a) Define WWW. Explain about static and dynamic web documents. (6M)
    b) Discuss i) Message transfer (6M)
       ii) Final Delivery

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