

Code: 13CE2006**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.TECH II SEM END EXAMINATIONS, JULY, 2015****STRENGTH OF MATERIALS-II****(Civil Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1 X 10 = 10M]**

1. (a) Give the formulas of circumferential stress and longitudinal stress of thin cylinders.
(b) What are the assumptions in the analysis of thin cylinders?
(c) Explain stress variation in thick cylinders.
(d) Define equivalent length of column.
(e) Write secant formula.
(f) Define principal planes and principal stresses.
(g) Define polar moment of inertia and radius of gyration.
(h) Define Euler's crippling load.
(i) Determine the crippling load for (a) both ends fixed (b) one end fixed and other end free.
(j) State the condition under which Mohr's circle becomes point.

PART – B**UNIT-I****Answer one question from each unit****[5 X 12 = 60M]**

2. (a) Derive the expressions for hoop and axial stresses developed in a thin cylindrical shell subjected to internal pressure P. [6M]
(b) A thin spherical shell of wall thickness of 2.5 mm and a radius of 250mm is subjected to an internal pressure P. what is the magnitude of P if diametral strain in the shell is limited to 0.0005 only. $E=200 \text{ Gpa}$. $1/m=0.3$. [6M]

(OR)

3. A thin cylindrical shell made of 5mm thick steel plate is filled with water under pressure of 3N/mm^2 . The internal diameter of the cylinder is 200mm and its length is 1.0m. Determine the additional volume of the water pumped inside the cylinder so to develop the required pressure. Given for steel $E=208 \text{ KN/mm}^2$ and $1/m=0.3$ and for water $K=2,200\text{N/mm}^2$. [12M]

UNIT-II

4. (a) Derive Lamé's formulae. [6M]
(b) A pipe of 250mm internal radius and 100mm thickness contains a fluid at a pressure of 6N/mm^2 . Find the maximum and minimum hoop stresses across the section. Also sketch the radial pressure distribution across this section. [6M]

Code: 13CE2006**(OR)**

5. A thick spherical shell of 100mm internal diameter is subjected to an internal fluid pressure of 30Mpa. If the permissible tensile stress is 80Mpa. Find the thickness of the shell. [12M]

UNIT-III

6. (a) Derive normal and tangential stresses for member subjected to biaxial principal stresses. [6M]
(b) The principal stresses at a point in a bar are 200N/mm^2 tensile and 100N/mm^2 compressive. Determine the resultant stress in magnitude and direction on a plane inclined at 45° to the axis of the major principal stresses. Also determine the maximum intensity of shear stress in the material at the point. [6M]

(OR)

7. (a) What are Mohr's circle and derives principal stresses, obliquity and radius of Mohr's circle. [6M]
(b) A horizontal steel bar of 20mm radius solid section is 2.4 m long and is rigidly hold at both ends so that no angular rotation occurs axially or circumferentially at the ends. If a bracket at the centre of the span supports a vertical load of 250N at a horizontal lever arm of 0.50m. What is the maximum tensile stress in the wall? [6M]

UNIT- IV

8. Write the equation of pure torsion and derive the same. [12M]

(OR)

9. A hollow circular shaft is transmitting power at 300 r.p.m. Outer diameter of shaft is 80mm and inner diameter is 60mm. The maximum shear stress developed in a shaft section is 65N/mm^2 . Determine the horse – power transmitted by the shaft. [12M]

UNIT-V

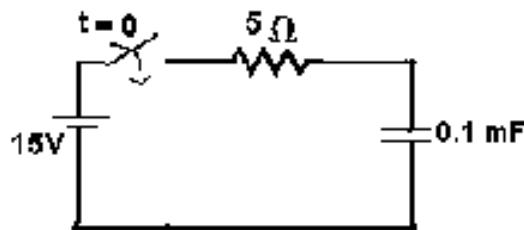
10. Derive the Euler's theory for long column when one end is fixed and other end is hinged mention the assumptions made in Euler's theory. [12M]

(OR)

11. A 3.2m long fixed and hollow cast iron column has its internal and external diameters as 60mm and so and **External 80mm** respectively. Determine Rankine's crippling load using the value of crushing stress to be 500Mpa and the value of Rankine's constant $1/1600$. [12M]

Code: 13EE2010**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.TECH II SEM END EXAMINATIONS, JULY, 2015****ELECTRICAL CIRCUIT ANALYSIS-II****(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1 X 10 = 10 M]**

- 1 a) In a symmetrical Y connected supply, if the phase voltage is $200 \angle 0^\circ$, what would be the line to line voltage?
- b) A 3- ϕ Y connected load has $I_Y = 30 \angle 120^\circ$ & $I_B = 32 \angle 250^\circ$, what would be I_R ?
- c) Write the expression for $V_C(t)$ at $t > 0$, assume capacitor initial charge is zero.



- d) Write the expression for time constant for a R-L series circuit excited by constant voltage.
- e) Consider a series RLC circuit having an inductance of 10 Mh and a capacitor of 100 micro farad. Determine the circuit resistance that would lead to over damped response.
- f) A series RLC circuit with $R=200$ ohms, $L=0.1$ H and $C=0.1 \mu$ F. Find the natural frequency of the circuit?
- g) Define Causality?
- h) Check whether the following polynomial is Hurwitz or not $P(s)=3s^4 + 6s^3 + 6s^2 + 3$
- i) Draw the attenuation vs frequency characteristics of all types of filter circuits.
- j) What is a difference between cut off frequency and resonance frequency.

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PART-B

Answer one question from each unit

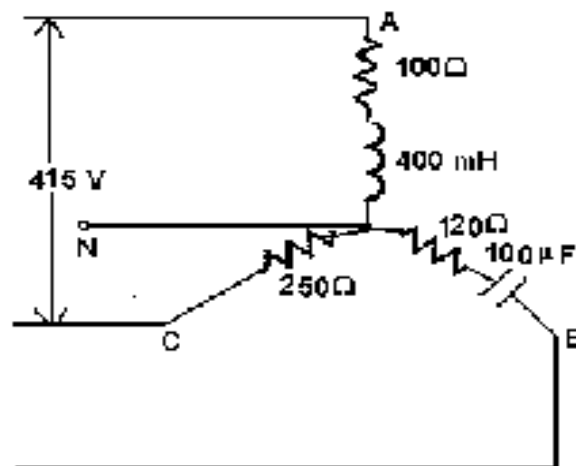
[5 X 12=60M]

UNIT 1

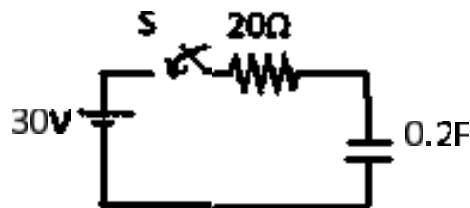
- 2 A balanced Δ - connected load consists of three impedances each having $R = 75 \Omega$ and $C = 0.2 \mu F$ connected in series. The supply is a Y-connected supply and has a 250 V phase voltage and 50 Hz frequency. Calculate the line currents and the phase angle of each line current with respect to the line voltages.

(OR)

- 3 A star connected load has impedance as shown in figure. The four wire supply has $V_L = 415 \text{ V}$, $f = 50 \text{ Hz}$ and phase sequence ABC. Calculate the line currents and the total power delivered to the load.

UNIT II

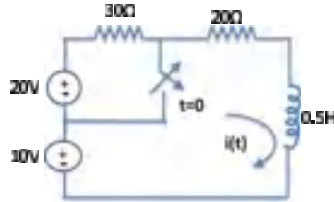
- 4 A series RC circuit consists of $R = 20 \Omega$ and $C = 0.2 \text{ F}$ as shown in Fig. A constant voltage of 30V is applied to the circuit at $t=0$. Determine voltages across R & C. Also obtain $V_c(t)$ at $t = 1.5 \text{ sec}$ for $t > 0$.



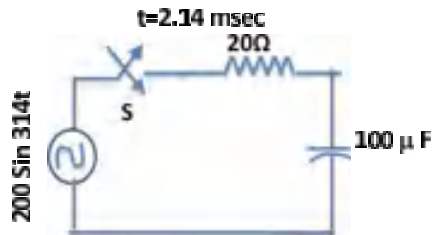
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(OR)

- 5 The Network shown reached steady state with switch closed. Now the switch is opened at $t=0$. Find $i(t)$ for $t>0$.

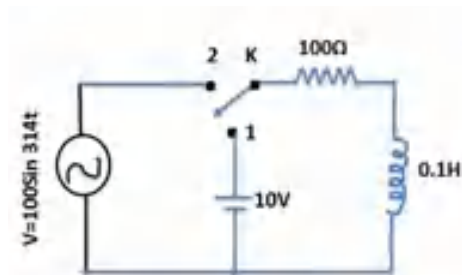
UNIT III

- 6 A series RC circuit has $R=20\ \Omega$ and $C=100\ \mu\text{F}$. A voltage $v=200\sin 314t$ is applied at $t=2.14\text{msec}$. Obtain an expression for $i(t)$.



(OR)

- 7 For the Network shown below, the switch is at position 1 for a long time. Switch K is moved to position 2 from position 1 at $t=0$. Obtain the current through the inductor for $t>0$.



Code: 13EE2010**UNIT IV**

- 8 Synthesize the following LC network in First and second Cauer form $Z(S) = \frac{2S^5 + 12S^3 + 16S}{S^4 + 4S^2 + 3}$

(OR)

- 9 Synthesize the following network function in First and second foster form
 $Z(S) = 5 \frac{(S^2 + 4)(S^2 + 25)}{(S^2 + 16)}$

UNIT V

- 10 A K-constant high pass filter has 15 kHz cut-off frequency and the design resistance $R_0 = 650$. Design the T and π section of this filter and determine its characteristic impedance, phase shift constant at 18 kHz

(OR)

- 11 Design m-derive low pass filter with a cut off frequency 1 KHZ, design impedance of 400 and the resonant frequency of 1100HZ?

Code: 13ME2009**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.TECH II SEM END EXAMINATIONS, JULY, 2015****KINEMATICS OF MACHINERY
(Mechanical Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1 X 10 = 10M]**

1.
 - a) What is the number of Degrees of Freedom of a 4-bar mechanism?
 - b) Write any two examples of a sliding pair
 - c) What is the use of pantograph?
 - d) Write an expression to calculate the number of instantaneous centers in a mechanism.
 - e) Write an expression for correct condition of steering.
 - f) Define interference in gears.
 - g) Write any two applications of worm and wheel.
 - h) Write any two types of follower motions working with cam.
 - i) Write any one application of reverted gear train.
 - j) What is the use of a gear box?

PART-B**Answer one question from each unit****[5 X 12=60M]****UNIT-I**

2. Explain different inversions of a double-slider crank chain with the help of neat sketches. [12M]
- (OR)
3.
 - a) Explain briefly with neat sketch, the working of crank and slotted lever quick return motion mechanism. [6M]
 - b) Describe the classification of kinematic pairs with neat sketches. [6M]

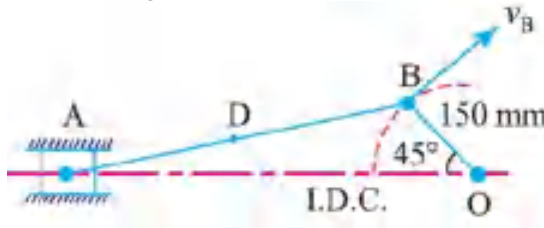
UNIT-II

4.
 - a) Describe the working of pantograph with neat sketch. [6M]
 - b) Prove that peaucellier mechanism is exact straight line mechanism. [6M]
- (OR)
5.
 - a) Sketch and explain a Davis steering gear and mention its disadvantages. [6M]
 - b) Two shafts are connected by a Hooke's joint. The driving shaft revolves uniformly at 500 r.p.m. If the total permissible variation in speed of the driven shaft is not to exceed $\pm 6\%$ of the mean speed, find the greatest permissible angle between the centre lines of the shafts. [6M]

Code: 13ME2009

UNIT-III

6. The crank of a slider crank mechanism rotates clockwise at a constant speed of 300 r.p.m. The crank is 150 mm and the connecting rod is 600 mm long. Determine : 1. Linear velocity and acceleration of the midpoint of the connecting rod, and 2. angular velocity and angular acceleration of the connecting rod, at a crank angle of 45° from inner dead centre position. [12M]



(OR)

7. PQRS is a four bar chain with link PS fixed. The lengths of the links are $PQ = 62.5$ mm ; $QR = 175$ mm ; $RS = 112.5$ mm ; and $PS = 200$ mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle $QPS = 60^\circ$ and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS. [12M]

UNIT-IV

8. In a symmetrical tangent cam operating a roller follower, the least radius of the cam is 30 mm and roller radius is 17.5 mm. The angle of ascent is 75° and the total lift is 17.5 mm. The speed of the cam shaft is 600 r.p.m. Calculate : 1. the principal dimensions of the cam; 2. the accelerations of the follower at the beginning of the lift, where straight flank merges into the circular nose. Assume that there is no dwell between ascent and descent. [12M]

(OR)

9. A cam, with a minimum radius of 25 mm, rotating clockwise at a uniform speed [12M]

is to be designed to give a roller follower, at the end of a valve rod, motion described below :

1. To raise the valve through 50 mm during 120° rotation of the cam ;
2. To keep the valve fully raised through next 30° ;
3. To lower the valve during next 60° ; and
4. To keep the valve closed during rest of the revolution i.e. 150° ;

The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm.

Draw the profile of the cam when the line of stroke of the valve rod passes through the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion.

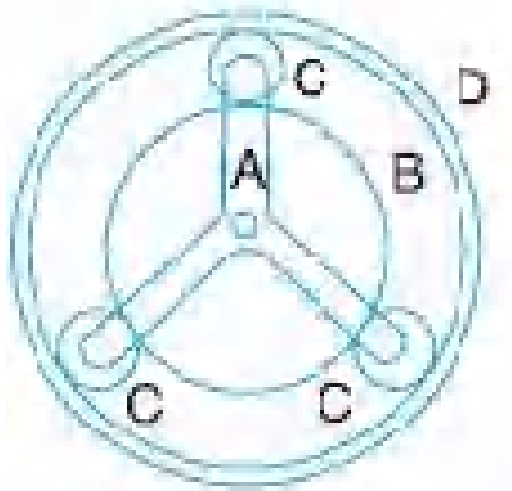
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UNIT-V

- 10 a) Differentiate between cycloidal and involute form of teeth in gears [4M]
- b) A pair of involute spur gears with 16° pressure angle and pitch of module 6 mm is in mesh. The number of teeth on pinion is 16 and its rotational speed is 240 r.p.m. When the gear ratio is 1.75, find in order that the interference is just avoided ; 1. the addenda on pinion and gear wheel ; 2. the length of path of contact ; and 3. the maximum velocity of sliding of teeth on either side of the pitch point. [8M]

(OR)

- 11 In an epicyclic gear of the 'sun and planet' type shown in Figure, 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. [12M]



Code: 13EC2010

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.TECH II SEM END EXAMINATIONS, JULY, 2015

PULSE AND DIGITAL CIRCUITS

(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

Answer all questions

[1 X 10 = 10 M]

1. a) The waveform which preserves its form when ~~transmitted~~ through a linear network is a/an _____ .
- b) Define rise time.
- c) The bandwidth of a low-pass RC circuit is 1 ~~K Hz~~. What is the rise time of the output for a step input?
- d) A circuit which clamps the negative peak of the signal to zero level is called _____.
- e) State Clamping theorem.
- f) Define transition time with respect to a diode.
- g) The pulse width of a monostable multivibrator is _____ .
- h) How hysteresis can be eliminated in a Schmitt Trigger?
- i) The ratio of the maximum difference between the actual sweep and the linear sweep which passes through the beginning and end points of the actual sweep to the amplitude of the sweep is called _____ .
- j) What is a sampling gate?

PART - B

Answer one question from each unit

[5 X 12 = 60 M]

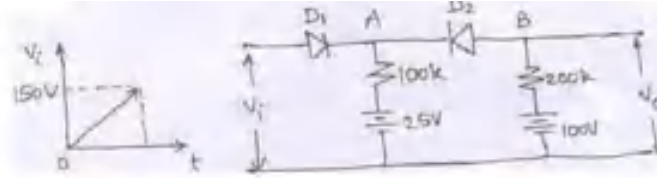
UNIT- I

2. a) A 10-Hz symmetrical square wave whose peak-to-peak amplitude is 2 V is impressed on a high-pass circuit whose lower 3-dB frequency is 5 Hz. Calculate and sketch the output waveform. [6M]
 - b) Draw the response of the circuit for step input critically damped and over damped cases for a fixed value of R and C. [6 M]
- (OR)**
3. a) Prove that an RC circuit behaves as a reasonably good integrator if $RC > 15T$, where T is the period of an input ' $E_m \sin \omega t$ '. [6 M]
 - b) What is the function of an attenuator and explain any one application of it. [6 M]

Code: 13EC2010

UNIT- II

4. The input voltage v_i to the two level clipper shown in figure varies linearly from 0 to 150 V. Sketch the output voltage v_o to the same time scale as the input voltage. Assume Ideal diodes. [12M]



(OR)

5. a) Draw the circuit of positive peak clamper circuit and explain its operation. [6 M]
b) Explain synchronized clamping circuit. [6 M]

UNIT- III

6. a) Design a transistor switch with the following data: $V_{CC}=12V$, $V_{BB}=6V$; $I_{C(sat)}=10mA$; $h_{FE(min)}=40$. Assume the junction voltages. [6M]
b) Give a brief note on piece-wise linear diode characteristics. [6M]

(OR)

7. Draw the circuit diagram for Schmitt trigger and explain its operation. What are the applications of the above circuit? Derive the expressions for UTP and LTP. [12M]

UNIT - IV

8. With the help of a neat circuit diagram and waveforms, explain the working of a collector- coupled astable multivibrator. [12M]

(OR)

9. Design a transistor bootstrap ramp generator to provide output amplitude of 12V over a time period of 2ms. The input signal is a negative going pulse with amplitude of 5 V, a pulse width of 2ms and the time interval between pulses is 0.5ms. The load resistance is 1K and the ramp is to be linear within 1%. The supply is to be $\pm 15V$. Take $h_{fe(min)} = 80$. [12M]

UNIT - V

10. a) Explain the operation of unidirectional sampling gate with neat sketches. [6M]
b) Illustrate a method for reducing pedestal in gate circuits. [6M]

(OR)

11. a) Explain the operation of diode controlled astable blocking oscillator. [6M]
b) Sketch a neat diagram of emitter timing monostable blocking oscillator and explain its operation. [6M]

Code: 13CS2007**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.TECH II SEM END EXAMINATIONS, JULY, 2015****DATABASE MANAGEMNET SYSTEMS****(Common to CSE & IT)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1 X 10 = 10M]**

1. a) What is DML?
b) What is a view?
c) What is degree of a relationship?
d) Define meta data?
e) What is superkey?
f) What is an attribute?
g) Define functional dependency.
h) What do you mean by atomicity of transaction?
i) What is Denormalization?
j) Write the syntax of delete operation

PART-B**Answer one question from each unit****[5X12=60M]****UNIT-I**

2. a) Explain different applications of DBMS. [8M]
b) Write about different data base users? [4M]
(OR)
3. a) Explain different data models [4M]
b) Explain three schema architecture with neat diagram . [4M]

UNIT-II

4. Explain ER model in detail with examples [12M]
(OR)
5. Describe various constraints with that can be defined on a table while creation with examples. [12M]

UNIT-III

6. Consider the following schemas

BOOK (Book_id, Title, Publisher_Name)

BOOK_AUTHORS (Book_id, Author_Name)

BOOK_COPIES (Book_id, Branch_id, No_Of_Copies)

LIBRARY_BRANCH (Branch_id, Branch_name, Address)

- i. Alter the structure of Book table by adding the attribute Year_of_publishing
- ii. Insert a new record into Book_authors table
- iii. Delete a record from Book_copies which is having more than 50 copies.
- iv. Modify the address of the branch as Vijayawada where ever it is Guntur.

[8M]

b) Write the complete syntax of Select statement with an example.

[4M]

(OR)

7. a) Explain aggregate operations with examples.

[8M]

b) Explain the concept of nested query with examples.

[4M]

UNIT-IV

8. a) Explain the first three normal forms with examples

[8M]

b) Prove that BCNF is more stricter than 3NF

[4M]

(OR)

9. Explain time stamp based protocol with examples

[12M]

UNIT-V

10. a) Differentiate serial and non serial schedules. What is serializability .

[4M]

b) Explain an algorithm to test the serializability of a schedule.

[8M]

(OR)

11.a) Explain clustered indexing with examples

[8M]

b) Explain Grant and Revoke operations with examples

[4M]