AR13

CODE: 13CE2006 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Regular / Supplementary Examinations April 2017

STRENGTH OF MATERIALS-II
(Civil Engineering)

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

PART-A

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

1. a) Differentiate between thick cylinder and thin cylinder
   b) What are the different methods for reducing hoop stress
   c) The hoop stress of thin spherical shell is given by ---
   d) The longitudinal stress is given by------
   e) Define principal stress
   f) The radius of mohrs circle is equal to ----
   g) What do you mean by strength of shaft
   h) Define polar moment of inertia
   i) What is equivalent length of column
   j) What do you mean by end conditions of column

PART-B

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

UNIT-I

2. A thin cylinder 1.5 m internal diameter and 5 m long is subjected to an internal pressure of 2 N/mm^2. If the maximum stress is limited to 160 N/mm^2 . find the thickness of the cylinder. E = 200 kN/mm^2 and Poisson's ratio = 0.3. Also find the changes in diameter, length and volume of the cylinder.

(OR)

3. A thin cylindrical shell 3 m long has 1m internal diameter and 15 mm metal thickness. Calculate the circumferential and longitudinal stresses induced and also the change in the dimensions of the shell, if it is subjected to an internal pressure of1.5 N/mm^2 Take E = 2x105 N/mm^2 and poison's ratio =0.3. Also calculate change in volume.

UNIT-II

4. a) What do you mean by lames equations derive these equations **6M**
   b) The hoop stress is minimum at the outer surface and maximum at the inner surface of thick cylinder prove this statement **6M**

(OR)

5. A compound cylinder is made by shrinking a cylinder of external diameter 300mm and internal diameter 250 mm over another cylinder of external diameter 250mm and internal diameter 200mm. the radial pressure at the junction after shrinking is 8 N/mm^2. Find the final stress set up across the section, when the compound cylinder is subjected to a internal fluid pressure of 84.5 N/mm^2

UNIT-III

6. Derive an expression for the stresses on an oblique plane of a rectangle body , when the body is subjected to simple shear stress.

(OR)

7. The principal tensile stress at a point across two mutually perpendicular planes are 100N/mm^2 and 50 N/mm^2 . Determine the normal, tangential, and resultant stresses on a plane inclined at 30^0 to the axis of the minor principal stress.

UNIT-IV

8. a) Derive the expression of Torsional stresses and strains. **6M**

b) Find the maximum torque that can be applied safely to a shaft of 300mm dia. The permissible angle of twist is 1.50 in a length of 7.5m length and the shear stress is not to exceed 42N/mm^2. Take C=84.4KN/mm^2 **6M**

(OR)

9. Two shafts of the same material and of same lengths are subjected to the same torque. If the first shaft is of a solid circular cross section and second shaft is of hallow circular cross section, whose internal diameter is 2/3 of external diameter and maximum shear stress developed in each shaft is same. Compare the weights of the shafts?

UNIT-V

10. Explain the following conditions:
(i) Column with one end fixed and the other end free.
(ii) Column with one end fixed and other end hinged.

(OR)

11. Calculate the Euler's critical load for a strut of T-section. The flange width is 100mm, over all depth is 80mm, and stem are 10mm thick. The strut is 3m long and in at both ends. Take E= 2x105 N/mm^2.

***

AR13

CODE: 13EE2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Regular / Supplementary Examinations April 2017
ELECTRICAL CIRCUIT ANALYSIS-II
(Electrical and Electronics Engineering)

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

PART-A

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

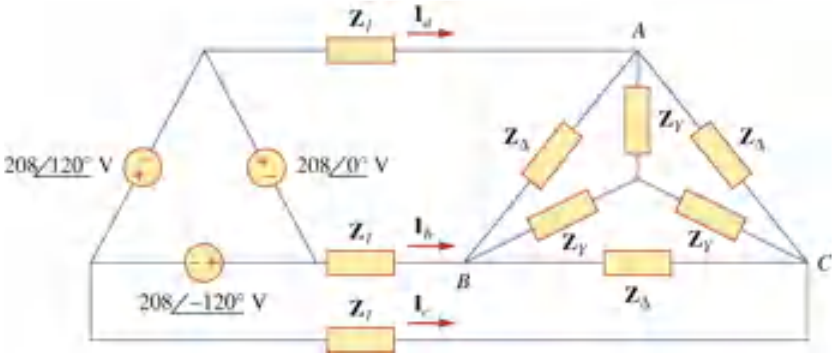
1. a) For an unbalanced 3-Phase 4-wire write an expression for the relationship between the neutral current and R, Y, B phase currents?
   b) What is the relationship between line current and phase for 3-Phase Star connected balanced load?
   c) What is the time constant of RC series circuit with DC excitation?
   d) What is the time constants of a series R,L circuit?
   e) A DC voltage source is connected across a series R-L-C circuit. Under steady state conditions, the applied DC voltage drops entirely across the .....?
   f) What is the current response of RL series circuit with sinusoidal input.
   g) For a series R-C circuit excited by a d-c voltage of 10V, and with time-constant τ,Find the voltage across C at time $t = \tau$?
   h) Write any three properties of LC admittance function?
   i) What is Band Reject filter?
   j) The propagation constant of a symmetrical π-section network is_____

PART-B

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

UNIT-I

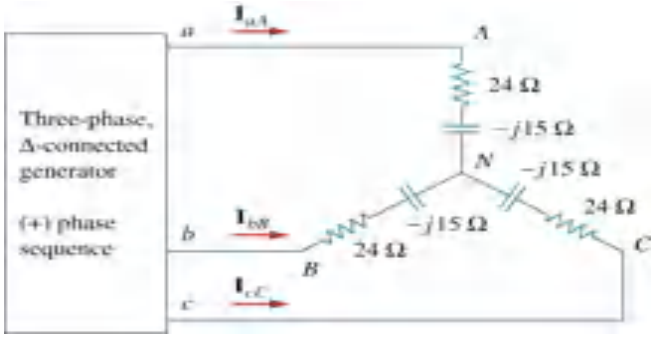
2. **22** Find the line currents I_a, I_b, and I_c in the three-phase network below. Take $Z_\Delta = 12 - j15\Omega$, $Z_Y = 4 + j6\ \Omega$, and $Z_l = 2\ \Omega$. **[12M]**



(OR)

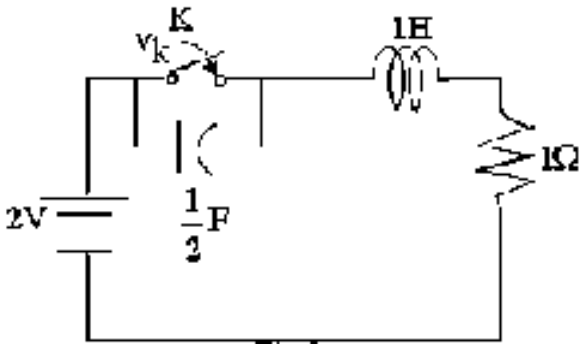
3. **a)** Prove that two watt meters are enogh to measure 3-Phase power. **[6M]**

b) For the balanced circuit below, $V_{ab} = 125\angle 0°$ V. Find the line currents I_{aA}, I_{bB}, and I_{cC}. **[6M]**



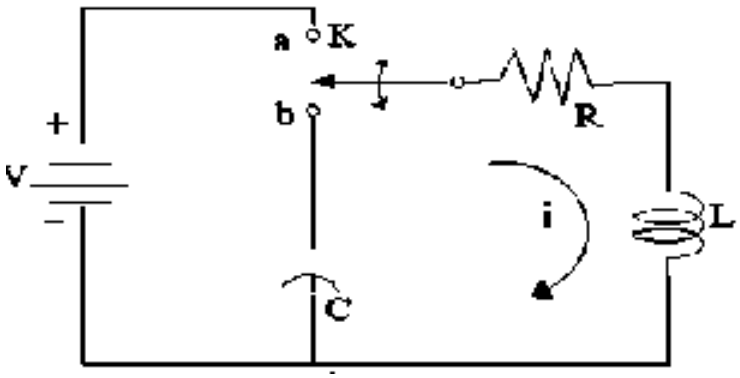
UNIT-II

4. The network shown in the accompanying Figure is in the steady state with the switch K closed. At t = 0 the switch is opened. Determine the voltage across the switch and V_k and $\frac{dv_k}{dt}$ at t = 0+ **12M**



(OR)

5. In the network of Figure, K is changed from position a to b at t = 0. Solve for i, $\frac{di}{dt}$, and $\frac{d^2i}{dt^2}$ at t = 0 + if R = 1000& , L=1H, C=0.1 ∝F , and V = 100 V. **12M**



UNIT-III

6. A series circuit consists of a voltage source ,Vs=20cos50t , a normally open switch , a 6 Ω resistor and a 0.16 H inductor, The switch closes at t=0 .The desired response is current. i) find natural response ii) forced response iii)complete response iv) i at t=40ms ? **12M**

(OR)

7. a) Find the current response of RC series circuit with voltage source $v(t)=V_m \cos(wt)$ **6M**

b) A voltage source 60cos1000t V is in series with 2kΩ resistor and a 1-μF capacitor. Find i_{forced}? **6M**

UNIT-IV

8. Test whether: **12M**
(i) the polynomial $F(s) = s^4 + s^3 + 2s^2 + 3s + 2$ is Hurwitz; and
(ii) the function $F_1(s)=\frac{ks}{s^2+\alpha}$ is positive real, where α and K are positive constants.

(OR)

9. Synthesize the following impedence fumction in Foster-I and Cauer-I Form : **12M**

$$Z(s) - \frac{(s^2 + 12s + 35)}{s(s^3 + 14s^2 + 62s + 48)}$$

UNIT-V

10. a) A π-section filter network consists of a series arm inductance of 10 mH and two shunt arm capacitances of 0.16μF each. Calculate the cutoff frequency and attenuation and phase shift at 12KHz.What is the value of nominal impodence in the pass band. **6M**

b) Design a low pass filter (both π and T-sections) having cutoff frequency of 2KHz to operate with a terminated load resistance of 500Ω. **6M**

(OR)

11. a) Design a HPF(both π and T-sections) having cutoff frequency of 1KHz to operate with a terminated load resistance of 800Ω. **6M**

b) What are demerits of constant K filters and How to overcome them. **6M**

***

AR13

Code: 13ME2009 **SET -2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Regular / Supplementary Examinations April 2017

KINEMATICS OF MACHINERY
(Mechanical Engineering)

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

PART –A

ANSWER ALL QUESTIONS

1. 10M
   a. Define Flexible link
   b. What is redundant degree of freedom of a mechanism
   c. How many links in a Paucellier Mechanism
   d. What is the fundamental equation of Steering gears
   e. What are the different methods of finding the velocity in a mechanism
   f. How many number of instantaneous centres for a mechanism with n-links
   g. What is a cam
   h. Which type of motion is suitable for high-speed cams
   i. Define Arc of Contact
   j. What is the function of differential gear.

PART –B

Answer one question from each unit **[5 X 12=60 M]**

UNIT I

2. What is the significance of degrees of freedom of a kinematic chain when it functions as a mechanism? Give examples. 12M

OR

3. Describe various inversions of a slider crank mechanism with examples 12M

UNIT II

4. What is a Scott-Russel mechanism? What is its limitation? How is it modified? 12M

OR

5. **a.** What is an automobile steering gear? What are its types? Which steering gear is preferred and why? 6M

b. Determine the maximum permissible angle between the shaft area of a universal joint if the driving shaft rotates at 800 rpm and the total fluctuation of speed does not exceed 60rpm. Also, find the maximum and minimum speeds of the driven shaft. 6M

UNIT III

6. The dimensions of the various links of a slider – crank mechanism, as shown in figure 1 are as follows. AB=120mm and BE=40mm and OB= 50mm makes an angle of 30^0 with OA and rotates at 150rpm, in CW direction, for the given configuration find Velocity and accelerations of B, E and A. 12M

Figure 1

OR

7. The mechanism of a wrapping machine is shown in figure 2 has the dimensions as follows: O_1A= 100mm; AC= 700mm; BC= 200mm; BD=150mm; O_2D=200mm; O_2E= 400mm; O_3C=200mm. The crank O_1A rotates at a uniform speed of 100 rad/s for the given configuration. Determine 1. Linear velocity of the point E on the bell crank lever using instantaneous center method. 12M

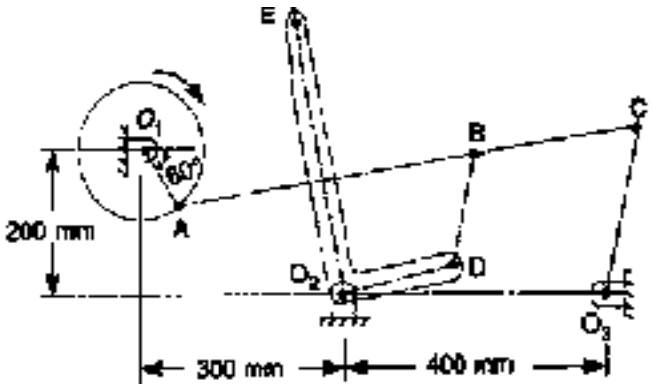


Figure 2

UNIT IV

8. a. What type of motion can be transmitted with a cam and follower combination? What are its elements? 6M

   b. Compare the performance of knife edge and Roller follower. 6M

OR

9. Draw the cam profile for the following conditions: 12M

   Follower type = Knife edged, lift = 40mm; base circle radius = 50mm; out stroke with SHM, for 60^0 cam rotation; dwell for 60^0 cam rotation; return stroke with SHM, for 90^0 cam rotation; dwell for the remaining period.

   Determine also max. Velocity and acceleration during out stroke and return stroke if the cam rotates at 1000 rpm in clockwise direction

UNIT V

10. Two gear wheels mesh externally and are to give a velocity ratio 3:1. The teeth are involute form. Module= 6mm, addendum= one module, Pressure angle: 20^o. The pinion rotates at 100 rpm. Find:

a) Number of teeth on pinion to avoid interference on it and the corresponding no. of teeth on the wheel. b) The length of path and arc of contact, c) The no. of pairs of teeth in contact. 12M

OR

11. An internal wheel B with 80 teeth is keyed to a shaft F. A fixed internal wheel C with 82 teeth is concentric with B. A compound wheel D-E gears with the two internal wheels. D has 28 teeth and gears with C while E gears with B. The compound wheels revolve freely on a pin which projects from a disc keyed to a shaft A co axial with F. If the Wheels have the same pitch and the shaft makes 800 rpm, what is the speed of shaft F? Sketch the arrangement. 12M.

AR13

CODE: 13EC2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Regular / Supplementary Examinations April 2017

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) Specify the condition for which a low pass circuit behaves as an integrator and draw the output when input is a square.
   b) What is the difference between over compensated and under compensated attenuators.
   c) What are the applications of voltage comparators.
   d) What is the difference between clipping and clamping circuits.
   e) Define the switching times of a diode
   f) What is the use of commutating capacitors in a bistable multivibrator?
   g) Give any two applications of astable multivibrator.
   h) What are the methods of improving linearization of sweep signal?
   i) Name the two types of monostable blocking oscillators and compare them.
   j) What is a slope error?

PART-B

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

UNIT-I

2. a) Derive the expression for rise time of a low pass circuit when it is excited by a step input. **6M**
   b) Compare the responses of perfectly compensated, under compensated and over compensated attenuators. **6M**

(OR)

3. a) Show how a high pass circuit having a time constant smaller than the time period of an input signal behaves as a differentiator. **6M**
   b) Draw the output waveforms of a high pass circuit excited by pulse waveform for different time constants. **6M**

UNIT-II

4. a) Draw a circuit to transmit that part of a sine wave, which is above -3V and give its transfer characteristics. **6M**
   b) Explain the working of a two level clipper using diodes with a sine wave input. **6M**

(OR)

5. a) State and prove the clamping circuit theorem? **6M**
   b) Explain the working of a negative clamping circuit. **6M**

AR13

CODE: 13EC2010 **SET-2**

UNIT-III

6. Discuss the effect of temperature on the saturation parameters of the transistor **12M**

(OR)

7. Explain the working of a Schmitt trigger and derive the expression for UTP **12M**

UNIT-IV

8. a) Design a collector coupled monostable circuit to generate a pulse of width 100μs for the following specifications: **6M**
V_{CC}=12V,$V_{CE(sat)}$=0.2V,$V_{BE(sat)}$=0.7V,V_{BB}=12V,$I_{C(sat)}$=2mA

b) Derive the expression for frequency of oscillations in astable multivibrator. **6M**

(OR)

9. Explain how a linear sweep is generated in a Miller sweep generator and derive the expression for its slope error **12M**

UNIT-V

10. Explain the working of a monostable blocking oscillator with emitter timing and obtain the expression for its pulse width. **12M**

(OR)

11. a) With the help of circuit diagram explain the working of unidirectional diode OR gate. **6M**

b) Explain the operation of bidirectional sampling gate using transistor. **6M**

***

AR13

CODE: 13CS2007 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular / Supplementary Examinations April 2017

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

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

PART-A

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

1. a) Define Instance and Schema.
   b) What is Data Independence?
   c) Define Weak-entity.
   d) What is a referential integrity?
   e) Write syntax for Group By and Having clause.
   f) What is the difference between constraint and trigger?
   g) What is lossless decomposition?
   h) Define Serializability.
   i) State Write-Ahead Log Protocol.
   j) What is the use of Hash function?

PART-B

Answer one question from each unit **[5 x 12=60M]**

UNIT-I

2. a) What is a data model? Explain in detail about various data models. 6M
   b) Explain the draw backs of conventional file processing system. 6M

(OR)

3. a) Explain about various database languages. 6M
   b) Draw and explain DBMS architecture. 6M

UNIT-II

4. a) Explain about different types of attributes in ER model. 6M
   b) Specify and explain various structural constraints of relationship type. 6M

(OR)

5. Discuss about various integrity constraints used for database system. 12M

UNIT-III

6. a) List and explain the common data types available in SQL. 6M
   b) Differentiate between independent and correlated nested queries. 6M

(OR)

7. a) Explain what types of constraints defined on query language. 6M
   b) Describe the basic parts of SQL query. 6M

UNIT-IV

8. a) Explain insertion, deletion and modification anomalies with suitable examples. 6M
   b) State BCNF. How does it differ from 3NF? 6M

(OR)

9. a) Why the concurrency control is needed? Explain it. 6M
   b) What is 2 PL? Explain its concept. 6M

UNIT-V

10. a) Explain about different recovery techniques. 6M
    b) Discuss in detail about cluster and Multilevel indexes. 6M

(OR)

11. a) Explain in detail about external hashing techniques. 6M
    b) Describe discretionary access control mechanism. 6M

***