AR13   SET-1

Code: 13CE2009
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

CONCRETE TECHNOLOGY
(CIVIL ENGINEERING)

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

PART-A
Answer all questions   **[1 X 10 = 10M]**

1. (a) Define heat of hydration?
   (b) What is flakiness index and elongation index?
   (c) What is the function of accelerators in concrete?
   (d) What are the functions of admixtures?
   (e) What is alkali aggregate reaction?
   (f) Define the term curing of concrete?
   (g) What are the advantages of proper mix design?
   (h) Define creep?
   (i) What are functions of sand in mortar?
   (j) What is clinker and how is it produced?

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

PART– B

UNIT-I

2. Explain in detail about the procedure of manufacturing the ordinary Portland cement?

(OR)

3. Based on application enumerate different types of cement with explanation?

UNIT-II

4. a) Explain the test procedure for finding specific gravity of coarse aggregate?
   b) Explain the test procedure for finding flakiness index and elongation index for coarse aggregate?

(OR)

5. Define the term workability? Explain any two tests to find the workability of concrete?

Code: 13CE2009

UNIT-III

6. Explain

    i) Abram's law
    ii) Gelspace ratio
    iii) Maturity concept

(OR)

7. Discuss the following

    i) Rebound hammer test

    ii) Ultrasonic pulse velocity test

UNIT-IV

8. What are the factors effecting creep? Explain the relation between creep and time?

(OR)

9. Define modulus of elasticity and shrinkage? Explain about types of shrinkage?

UNIT-V

10. a) Discuss the affect of vibration on strength and durability properties of concrete?

   b) Discuss briefly about the durability of concrete?

(OR)

11. Explain about the proportioning of concrete mixes by various methods?

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AR13

CODE: 13EE2012   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2016

POWER SYSTEMS-I

(ELECTRICAL AND ELECTRONICS ENGINEERING)

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

PART-A

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

1.
   a) What is the role of Condenser in Thermal power plant?
   b) What is run-off?
   c) What are the merits of Nuclear power plant?
   d) Draw the VI characteristics of a Solar Cell.
   e) Name different DC distribution feeders.
   f) What is the purpose of Lightening Arrestor in a substation?
   g) Define Diversity factor.
   h) What are the desirable characteristics of Tariff structure?
   i) Define the term: Thermal resistance of a cable.
   j) List out major equipment in Gas Insulated Substations.

PART-B

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

UNIT-I

2. With a neat layout diagram explain the working of a Thermal power plant.   12M

(OR)

3.
   a) Briefly discuss the merits and demerits of a Hydro electric power plant.   6M
   b) Briefly explain the following terms with reference to a Hydro electric power plant.   6M
   (i) Mass curve (ii) Catchment area (iii) Spill way (iv) Surge tank (v) Draft tube
   (vi) Turbine

UNIT-II

4. Explain the functions of different components of a Gas turbine power plant with a neat block diagram   12M

(OR)

5.
   a) With a neat schematic diagram explain the operation of Fast breeder reactor. What are its merits and demerits?   8M
   b) Discuss various safety aspects of a nuclear power plant.   4M

UNIT-III

6.
   a) List the advantages of ring mains system of distribution over the radial system.   6M
   b) A DC ring main ABCDA is fed from point A with 240 V supply and the loop resistances of various sections are AB = 0.05 ohms; BC = 0.1 ohms; CD = 0.15 ohms and DA = 0.02 ohms. The main supplies 50 A loads at B, C and D. Calculate the voltages at each load point. If the points A and C are inter connected through a link of 0.1 ohm.   6M

(OR)

7. a) Compare Indoor and Outdoor substations.   6M
    b) With a brief single line diagram, indicate various equipment used in a substation.   6M
        What is the role of instrument transformers in a substation?

UNIT-IV

8. a) What is load curve? What information can be obtained from a load curve? Draw   6M
        the daily and annual load curves of a sample load.
    b) A generating station has a maximum demand of 36000kW and has a connected   6M
        load of 66000kW. Annual generated units are 26×10^7 kWh. Calculate the demand
        factor and annual load factor.

(OR)

9. a) Define and Explain the term Tariff. List out various types of tariff structures that   6M
        are there in practice.
    b) Explain Two-part tariff and compare it with power factor tariff.   6M

UNIT-V

10. a) Explain the classification of cables and discuss their general structure with a neat   6M
        sketch.
    b) Explain the following methods of grading of underground cables   6M
        (i) Capacitance grading (ii) Inter sheath grading

(OR)

11. a) Explain the maintenance schedule of Gas Insulated substations.   6M
    b) What are the merits and demerits of SF_6 Gas Insulated substation?   6M

CODE: 13ME2009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

KINEMATICS OF MACHINERY
(MECHANICAL ENGINEERING)

Time: 3 Hours   Max Marks: 70
PART-A
Answer all questions   [1 X 10 = 10 M]

1. a) Illustrate Gruebler criterion for DOF of plane mechanisms using an example.
   b) Mention any two applications of the second inversion of slider-crank chain mechanism.
   c) Write any two applications of Pantograph mechanism.
   d) What is the fundamental equation of steering gears? Which steering gear fulfills the equation?
   e) Mention the role of coriolis component of acceleration?
   f) Indicate the method of locating Instantaneous centre in a four bar mechanism?
   g) What are the requirements for high speed cams?
   h) What is a displacement diagram? Why is it necessary to draw it before drawing a cam profile.
   i) Define the terms module and Pitch point
   j) What is a reverted gear train? Where is it used?

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

UNIT-I

2. Illustrate the following mechanisms with necessary sketches: (i) Elliptical [12M] Trammel (ii) Oldham's coupling (iii) scotch yoke mechanism.
   (OR)
3. a) Classify the kinematic pairs according to the nature of relative motion.   [4M]
   b) A crank rocker mechanism ABCD has the dimensions AB=30 mm, BC=90 mm, [8M] CD=75 mm and AD (fixed link) = 100 mm. Determine the maximum and the minimum values of the transmission angle. Locate the toggle positions and indicate the corresponding crank and transmission angles.

UNIT-II

4. a) A circle with **AD** as diameter has a point **B** on its circumference. On [4M] **AB**produced, there is a point **C** such that if **B** turns about A, the product **ABXAC** is constant. Prove that the point moves in a straight line perpendicular to AD produced.

   b) Compare between Hart's mechanism and Scott-Russel mechanism with [8M] suitable illustrations

(OR)

5. a) Describe the working principle of Ackermann Steering gear mechanism with the help of a sketch. What are its relative advantages over Davis Steering Gear mechanism? [6M]

b) A Hooke's joint is used to connect two shafts. The driving shaft is rotating uniformly with a speed of 400 rpm. The maximum speed of the driven shaft is 420 rpm. Determine the greatest permissible angle between the two shafts. Also find the minimum speed of the driven shaft. [6M]

UNIT-III

6. Find out the acceleration of the slider **D** and the angular acceration of link **CD** for the engine mechanism shown in the figure. The crank **OA** rotates at 180 r.p.m. in clockwise direction. The various lengths are:
OA=150mm; **AB**=450mm; **PB**=240mm; **BC**=210 mm; **CD**=660mm. [12M]
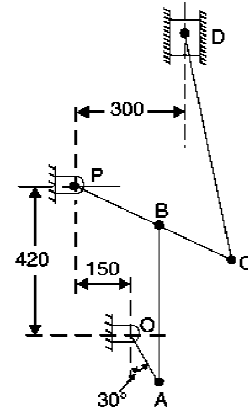
(OR)

7. In a slider crank mechanism, the crank is 480 mm long and rotates at 20 rad/s in the counter-clockwise direction. The length of the connecting rod is 1.6 m. When the crank turns 60^0 from the inner dead center, determine (i) Velocity of the slider, (ii) Position and velocity of a point F on the connecting rod having the least absolute velocity (iii)angular velocity of the connecting rod. [12M]

UNIT-IV

8. Draw the profile of the cam that gives a lift of 40 mm to a rod carrying a 20 mm diameter roller. The axis of the roller passes through the centre of the cam. The least radius of the cam is 50 mm. the rod is to be lifted with simple harmonic motion in quarter revolution and is to be dropped suddenly at half revolution. Determine the maximum velocity and maximum acceleration during the lifting if the Cam rotates at 60 rpm. [12M]

(OR)

9.   A Cam with a minimum radius of 25 mm is to be designed for a knife-edge [12M]
follower with the following data: To raise the follower through 35 mm during
60^0 rotation of the cam, Dwell for the next 40^0 of the cam rotation, Descending
of the follower during the next 90^0 of the cam rotation and again dwell during
the rest of its motion. Then, (i) Draw the profile of the cam if the ascending and
descending of the cam is with simple harmonic motion and the line of stroke of
the follower is offset 10 mm from the axis of the cam shaft. (ii) what is the
maximum velocity and acceleration of the follower during the ascent and the
descent if the cam rotates at 150 rpm.

UNIT-V

10. a)   Derive an expression to determine (i) velocity ratio (ii) center distance in case of [4M]
      spur gears.
   b)   A spur gear has 30 teeth and a module of 1.4 mm. It rotates at 360 rpm. [8M]
      Determine its circular pitch and pitch line velocity.

(OR)

11. a)   Explain the principle of a compound gear train using a neat sketch. [4M]
   b)   Determine a suitable train of wheels to satisfy the requirements of clock, the [8M]
      minute hand of which is fixed to a spindle and the hour hand to a sleeve rotating
      freely on the same spindle. The pitch is the same for all the wheels and each
      wheel has atleast 11 teeth. The total number of teeth should be as small as
   possible.

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AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

LINEAR CONTROL SYSTEMS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

PART-A
**ANSWER ALL QUESTIONS**   **[1 x 10 = 10 M]**

1.
   a) What are the advantages of open loop control systems
   b) Define transfer function
   c) What are the applications of DC servomotor?
   d) Define delay time
   e) What are the necessary conditions for stability using R-H criterion?
   f) What is a breakaway point?
   g) Define gain margin
   h) What is band width?
   i) Draw the pole zero configuration of lag compensator
   j) Write any two properties of state transition matrix

PART-B

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

2.
   a) Distinguish between open loop control system and closed loop control system   **6M**
   b) Find C(s) / R(s) by using Mason's gain formula   **6M**
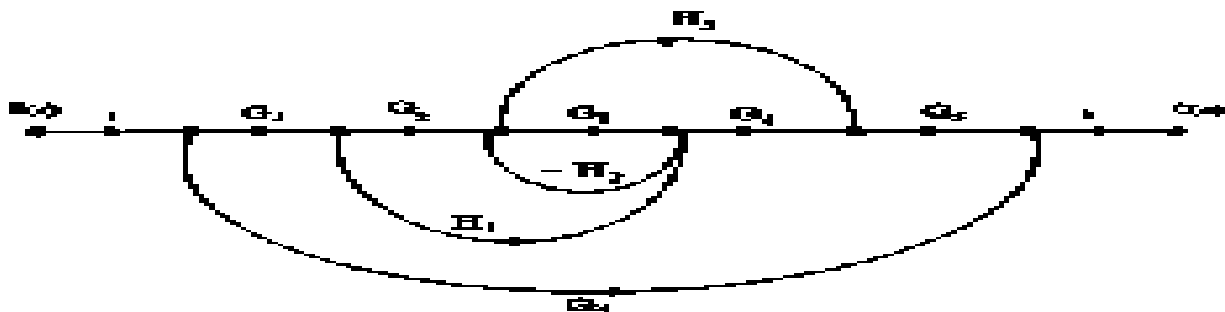
(OR)

3.
   a) Write the advantages and disadvantages of open loop and closed loop control systems.   **6M**
   b) Obtain the transfer function between X(s) and F(s) of the figure shown below.   **6M**
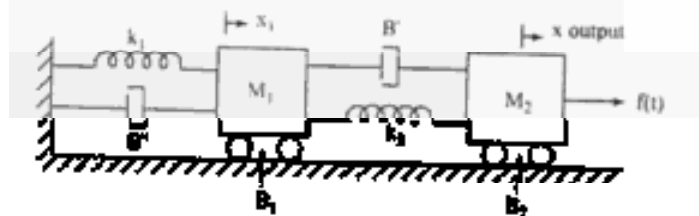
UNIT-II

4. a) Derive the transfer function and develop the block diagram of Armature controlled DC servo motor   **6M**

   b) A unity feedback system is described by the loop transfer function   **6M**

   $G(s) = \dfrac{8}{s(s+3)}$. Determine the peak time, peak overshoot and settling time.

(OR)

5. a) Derive an expression for the maxim peak overshoot and rise time of a typical 2nd order system time response.   **6M**

   b) Derive the transfer function of AC servo motor   **6M**

UNIT-III

6. a) Define the following terms   **6M**
   i) Stable system   ii) Critically stable system   iii) Conditionally stable system

   b) For the system having characteristic equation $2s^4 + 4s^2 + 1 = 0$. Find the following   **6M**
   i) the no. of roots in the left half of s-plane ii) the no. of roots in the right half of s-plane iii) the no. of roots on the imaginary axis. Use the RH stability criterion

(OR)

7. A unity feedback system has an open loop function   **12M**

   $G(s) = \dfrac{k}{s(s^2 + 3s + 10)}$ make a rough sketch of root locus plot by determining the

   following (i) Centroid, number and angle of asymptotes (ii) angle of departure of root loci from the poles, (iii) Breakaway points if any, (iv)points of intersection with jw axis

UNIT-IV

8. a) Derive the expressions for frequency domain specifications of a second order system   **6M**

   b) Given the open loop transfer function of a unity feedback system   **6M**

   $G(s) = \dfrac{1}{s(3+s)(1+2s)}$. Draw the Bode plot and measure from the plot the frequency at which the magnitude is 0dB.

(OR)

9. a) State and explain Nyquist stability criterion.   **6M**

   b) Sketch the nyquist plot and investigate the closed loop stability of the given open loop transfer function $G(s) = \dfrac{100}{s(s+3)(s+5)}$ **6M**

UNIT-V

10. Consider a unity feedback system with open loop transfer function   **12M**

   $G(s) = \dfrac{K}{s(1+s)(2+s)}$

   design a suitable compensator so that the compensated system has

   Kv = 10 sec^{-1}

   Phase margin = 40^0

   Gain margin $\leq$ 12 db

(OR)

11. a) Give the properties of state transition matrix   **4M**

   b) The state equation of the LTIV system is given by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u;$ **8M**

   $y = [1 \ 0] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$

   i) Determine the state transition matrix

   ii) Find the solution of state equation for unit step input.

Code: 13CS2008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

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

PART-A

Answer all questions   **[1 x 10 = 10M]**

1. a) list the different types of Buses
   b) What is cache memory?
   c) What is the purpose of addressing modes?
   d) Define Computer Organization
   e) What is RISC?
   f) What is Data Bus?
   g) What are Logic micro operations?
   h) What is Virtual Memory?
   i) Define PROM
   j) What is Address Bus?

PART - B

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

UNIT - I

2. a) What is a computer register. Draw the block diagram of General register Computer
   b) Explain about Micro operations and logic operations

(OR)

3. a) Draw the diagram for one stage of arithmetic logic shift unit and explain
   b) write about
       i) Binay adder
       ii) Binary Incremental

UNIT -II

4. Write about reverse polish notation

(OR)

5. Explain about instruction formats. Give an example for one- address instructions

UNIT-III

6. a) Write about Associative memory
   b) What is locality of reference

(OR)

7. a)Write about Self associative mapping
   b) Explain about Main Memory

UNIT-IV

8. a)Write About Programmed I/O
   b) Explain about Interrupt – Initiated I/O

(OR)

9. a) Destination –initiated transfer using handshaking
   b) Explain about Peripherals Devices and IOP

UNIT-V

10. a) Explain about Instruction pipelining
    b) Explain about Arbitration procedure

(OR)

11. Explain about
       i)   CISC
       ii)   RISC