AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April-2019

PRE-STRESSED CONCRETE
(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) Explain the basic concepts of pre stressing .   7M
   b) Advantages of prestressed concrete than R.C.C.beam   7M

(OR)

2. a) List out systems of post tensioning and explain any one system   7M
   b) Explain freysssinet system with neat sketch   7M

UNIT-II

3. a) list out types of losses and explain any one loss   4M
   b) A concrete beam is prestressed by a cable carrying an initial prestressing force of 300Kn.The cross-sectional are of the wires in the cable is 300mm^2.Calculate the percentage loss of stress in the cable due to shrinkage of concrete using Is:1343 recommendations assuming the beam to be (i) pre tensioned (ii) post tensioned Assume Es=210Kn/m^2 and age of concrete at transfer =8 days.   10M

(OR)

4. A prestressed concrete beam 250mm wide 450mm deep has a span of 10m.The beam is prestressed by steel wires of area 350mm^2 provide at uniform eccentricity of 50 mm with an initial prestress of 1200N/mm^2.Determine the percentage loss of stress in the wires.   14M
   a) If the beam is Pre tensioned beam
   b) If the beam is post tensioned beam
   Ultimate creep strain=40x10^{-6}mm/mm/N/mm^2 for Pre tensioned beam
   Ultimate creep strain=22x10^{-6}mm/mm/N/mm^2 for Pre tensioned beam
   Shrinkage of concrete =300x10^{-6} for Pre tensioned beam
   Shrinkage of concrete =215x10^{-6}for Post tensioned beam
   Relaxation of steel stress=5% of the initial stress
   Anchorage slip=1.25mm; Friction coefficient of wave effect =K=.00015

UNIT-III

5. A post tensioned concrete beam of rectangular section 250mm wide is to be designed for a uniformly distributed live load of 12Kn/m over an effective span of 8m.The stress in the concrete must not exceed 17N/mm^{2}in compression and 1.4N/mm^2 in tension at any time and loss of prestress may be assumed to be 15%   14M
   a) Calculate the minimum possible depth of beam
   b) For the section provided, calculate the minimum prestressing force and the corresponding eccentricity.

(OR)

6. A prestressing force of 200KN is transmitted through a distribution plate 150mm 14M
wide and 150mm deep ,the center of which is located at 100mm from the bottom
of an end block having a section 150mm wide and 300mm deep .Evaluate the
position and magnitude of the maximum tensile stress on horizontal section
passing through the center of the distribution plate using the methods of
a) magnel b) Guyon .Design reinforcement for end block.

UNIT-IV

7. A pre cast pre tensioned beam of rectangular section has a breadth of 100 mm and depth of
200mm ,the beam with an effective span of 6m,is prestressed by tendons with their
centroid coinciding with the bottom kern. The initial force in the tendon is 200KN. The
loss of prestress may be assumed to be 15%.The beam is incorporated in composite T- 14M
beam by casting atop flange of breadth 420mm and thickness 40mm,if the composite beam
support s a live load of 8Kn/m2,calculate the resultant stresses developed in the precast
and in situ cast concrete assuming the pre-tensioned beam: a) unpropped and b) propped
during casting of the slab .assume if any necessary data
(OR)
8. Explain the design procedure of composite sections 14M

UNIT-V

9. a) What are the factors influencing on deflections 4M
   b) A PSC beam with a cross sectional area of $32000mm^2$ and radius of gyration of 70mm is 10M
   prestressed by a parabolic cable carrying an effective prestress of 1000Mpa, the span of
   the beam is6m.The cable consists of 6 wires of 7mm diameter wires, has an eccentricity
   of 50mm at center and zero at support, Estimate the central deflection of the beam
(OR)
10. A prestressed concrete beam of rectangular section 300mm wide and 500mm deep is 14M
    prestressed by 2 post-tensioned cables of area $600mm^2$ each .Initially stressed
    to1600N/mm^2.The cables are located at a constant eccentricity of 100mm throughout the
    length of the beam having a span of 10m.The modulus of elasticity of steel and concrete
    is 210 and 38 KN/mm^2 .
    a) Neglecting all losses, find the deflection at the centre of span when it is supporting its
       own weight.
    b) Allowing for 20% loss in prestress, find the final deflection at the centre of span when
       it carries an imposed load of 18KN/m.

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CODE: 16EE3019   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B. Tech II Semester Regular Examinations, April-2019

PLCS & SCADA THEORY
(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) Justify how an automated system achieve superior performance compared to a manual one   8M
   b) Define automation and why it required in industry?   6M
   (OR)
2. a) Briefly explain about the role of automation in industry   7M
   b) Discuss how a real time control system is associated with industrial automation   7M

UNIT-II

3. a) Briefly demonstrate the components of programmable logic controller   7M
   b) Distinguish between normally open and normally closed switches..   7M
   (OR)
4. a) Sketch the layout of PLC Architecture and describe the function of each block   7M
   b) Explain how PLC electrically wired with I/O Modules   7M

UNIT-III

5. a) Draw and explain the PLC equivalent of AND, OR gates   7M
   b) Implement the PLC Ladder diagram for the Boolean algebra expression (A+B+C). (D+E+F). G. H = M. Also show the gate diagram   7M
   (OR)
6. a) Demonstrate the importance of Ladder logic for programmable logic controllers (PLCs) used in industrial control applications   8M
   b) Explain the relay type instructions in ladder diagram   6M

UNIT-IV

7. a) What is Latching and explain how it will be interpreting in Ladder logic diagrams   7M
   b) Distinguish up and down counter using ladder diagrams   7M
   (OR)
8. a) Analyze and interpret typical PLC timer ladder logic program using suitable example   7M
   b) Develop the ladder logic that will turn on a light, after switch *A* has been closed 10 times. Push button *B* will reset the counters   7M

UNIT-V

9. a) Explain the components of SCADA systems   8M
   b) Explain SCADA applications.   6M
   (OR)
10. a) What is RTU and explain its importance in SCADA systems   7M
    b) Compare discrete and analogue control systems.   7M

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April-2019
THERMAL ENGINEERING - II
(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

NOTE:- Use of steam tables book is allowed.

UNIT-I

1. a) Find the dryness fraction, specific volume and internal energy of steam at 7 bar and enthalpy of 2550 kJ/kg using steam tables.   5 M
   b) Draw p – V, T – S and h – s diagrams of Rankine cycle and derive an expression for its efficiency.   9 M

(OR)

2. a) List out the advantages and disadvantages of Regenerative cycle over simple Rankine cycle.   7 M
   b) Distinguish between volumetric analysis and gravimetric analysis and explain the procedure to convert one form to another form.   7 M

UNIT-II

3. a) Give the detailed classification of boilers.   7 M
   b) Describe the construction and working of a Babcock and Wilcox water tube boiler with a neat sketch.   7 M

(OR)

4. a) Differentiate between mountings and accessories.   5 M
   b) Obtain the expression for the natural draught in terms of height of water column. Also state the assumption made.   9 M

UNIT-III

5. a) Explain various types of nozzles and their distinguishing features.   4 M
   b) Starting from fundamentals, show that the maximum discharge through a nozzle, the ratio of throat pressure to inlet pressure is given by $[2 / (n+1)]^{n / (n - 1)}$ where 'n' is the index for isentropic expansion through the nozzle.   10M

6. a) What are the effects of air leakage into the condenser? 7 M
   Explain the Edwards Air Pump with neat sketch.
   b) A condenser has vacuum of 70 cm of Hg when barometer 7 M
   reading is 76 cm. Condenser has temperature of 30°C. Air
   leaks into condenser at the rate of 1 kg air per 2500 kg steam.
   Calculate (i) the capacity of air pump per kg of steam for
   removal of air from steam entering condenser, and (ii) the
   mass of water vapour accompanying this air.

UNIT-IV

7. a) Discuss the method of velocity compounding of an impulse 7 M
   turbine for achieving rotor speed reduction.
   b) A single stage of simple impulse turbine produces 120 kW at 7 M
   blade speed of 150 m/s when steam mass flow rate is 3 kg/s.
   Steam enters moving blade at 350 m/s and leaves the stage
   axially. Considering velocity coefficient of 0.9 and smooth
   steam entry without shock into blades, determine the nozzle
   angle and blade angles. Solve using velocity diagram.

(OR)

8. a) Define the term 'Degree of reaction' as applied to a steam 7 M
   turbine. Show that for Parsons turbine the degree of reaction
   is 50%.
   b) In a Parson's reaction turbine the rotor of 1m diameter runs at 7 M
   3000 rpm. Determine the isentropic enthalpy drop in the stage
   considering stage efficiency of 0.80, $\rho = 0.7$, blade outlet
   angle = 20°.

UNIT-V

9. a) What are different parameters that influence the performance 7 M
   of gas turbine cycle? Explain
   b) What are the merits and demerits of closed cycle gas turbine 7 M
   over open cycle gas turbine

(OR)

10. a) Explain the principle of jet propulsion and classify the jet 7 M
    propulsive engines.
    b) Explain the Turbo prop with a neat sketch. 7 M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B. Tech II Semester Regular Examinations, April-2019

COMPUTER ORGANIZATION AND ARCHITECTURE
(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) Explain the concept of Tri-state Buffer and Memory 7M
   Transfer Operations.
   b) Illustrate the operation of Arithmetic Logic Shift Unit 7M
   with the help of diagram and Functional table.

(OR)

2. a) Explain the operation of four stage Instruction cycle 7M
   execution with neat sketch.
   b) Define Computer Organization and Architecture and 7M
   Sketch the block diagrams of Von-Neuman and
   Harvard Architecture.

UNIT-II

3. a) Explain step by step procedure of Hardware Algorithm 7M
   for Division operation.
   b) Explain Booth's multiplication algorithm with an 7M
   example

(OR)

4. a) Articulate the concept of Addition and Subtraction of 7M
   Floating-Point Numbers with the help of Example.
   b) Discriminate the functionalities between Decimal 7M
   Multiplication and Division with the help of flowchart.

UNIT-III

5. a) Describe classification of Semiconductor Memories and Explain its Functionality. **7M**
   b) Illustrate the functionality of Associative Memory and Explain Match Logic model. **7M**

(OR)

6. a) Articulate the concept of Cache Memory interaction to CPU & Define Cache hit, Miss, Hit Ratio. **7M**
   b) Illustrate the concept of Cache Mapping Techniques with the help of Diagram. **7M**

UNIT-IV

7. a) Illustrate the operation of Direct Memory Access with the help of block diagram interaction to CPU. **10M**
   b) Explain about CPU-IOP Communication process. **4M**

(OR)

8. a) Articulate the concept of Asynchronous data transfer mechanism source Initiated Models. **7M**
   b) Explain in detail about I/O interface and its operation. **7M**

UNIT-V

9. a) Articulate the operation of four segment Instruction Pipeline with the help of timing diagrams. **7M**
   b) Exemplify the concept of Pipeline Hazards with Examples. **7M**

(OR)

10. a) Illustrate the concept of Microprogram program sequencer for a control memory. **7M**
    b) Define the following **7M**
       (a) SISD [2M]
       (b) Micro Instruction format [3M]
       (c) MISD [2M]

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April-2019
ARTIFICIAL INTELLIGENCE
(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) Describe how to define a problem using state space approach.   6 M
   b) What is a production system? Discuss its characteristics.   8 M

(OR)

2. a) Trace the working of constraint satisfaction technique by considering the following   9 M
   crypt arithmetic problem.

          S E N D
        + M O R E
        _____
         M O. N. E. Y
        _____-

   b) What is a heuristic function? Describe its role in problem solving.   5 M

UNIT-II

3. a) Explain frme based knowledge representation techniques.   8 M
   b) Describe the approaches of knowledge representation.   6 M

(OR)

4. Consider the following facts: 14 M
   1. Every child loves Santa.
   2. Everyone who loves Santa loves any reindeer.
   3. Rudolph is a reindeer, and Rudolph has a red nose.
   4. Anything which has a red nose is weird or is a clown.
   5. No reindeer is a clown.
   6. Scrooge does not love anything which is weird.
   Prove that "Scrooge is not a child" using resolution.

UNIT-III

5. a) What is a production based system? Explain.   7 M
   b) Write notes on Rule value approach.   7 M

(OR)

6. a) Explain in detail about Bayesian network.   7 M
   b) Write a brief notes on fuzzy reasoning.   7 M

UNIT-IV

7. a) Discuss the differences between K Strips and Strips systems.   6 M
   b) Explain the components of planning system.   8 M

(OR)

8. a) Describe the significance of strategic explanations.   7 M
   b) Explain in detail about adaptive learning.   7 M

UNIT-V

9. a) Consider an example expert system and discuss its characteristics.   9 M
   b) What is expert system shell? Describe its importance.   5 M

(OR)

10. a) Write notes on architecture of expert systems.   7 M
    b) Describe the role of meta knowledge and heuristics in expert systems.   7 M

AR13

CODE: 13CE3015   SET-1

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

DESIGN OF CONCRETE STRUCTURES –II
(Civil Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]
Use of I.S 450-2000, I.S 3370-2009 and Sp-16 design tables are allowed. Design must followed by Limit state.

1. a) What is the basic function of footing
    b) Mention different types of combined footings
    c) Mention different types of column support conditions in flat slab system
    d) Show the location of punching shear in flat slab supported by central column support
    e) What are the forces to be consider in the design of deck slab of R/C bridges
    f) What is meant by economic span in R/C bridge design
    g) Define the basic function of Pile cap
    h) Write any two differences between end bearing pile and friction piles
    i) Mention the design components of elevated water tank
    j) In the membrane analysis of dome shaped water tank roof ,what type of design forces need to be consider

PART-B

ANSWER ONE QUESTION FROM EACH UNIT   [5x12=60M]

UNIT-I

2. a) Design and detail a Square type footing of uniform thickness to receive column load 1500kN. Assume column size 450x450mm, safe bearing capacity of soil 150kN/m^2. Use concrete grade M20 and steel HYSD –Fe415 grade.   9
    b) As per I.S code write the design considerations to transfer the column load on foundation.   3

(OR)

3. Design a combined rectangular footing (Slab base) for Two columns A and B each carried axial loads 450kN and 600kN respectively. The column A :300x300mm and column B :450x450mm size , and centre to centre spacing between column 3m , and safe bearing capacity of soil 120kN/m$^{2.}$.Design and detail the reinforcement and apply necessary design checks. Use M20 grade concrete and Fe415 grade steel   12

UNIT-II

4. a) Briefly discuss about design methods used in the analysis of Flat slabs   4
    b) Design a circular roof slab for a circular room of internal diameter 6m carrying imposed load 3kN/m$^{2.}$ Assume the slab is simply supported .Use M20 grade concrete and Fe415 grade steel. Neatly sketch the detailing aspects and apply necessary checks.   8

(OR)

5. a) Design the internal panel of flat slab for 4x4m room, that carrying 6kn/m^2 live load. Assume all corners supported by columns (size 300x300mm) . Use M20 grade concrete and Fe415 grade steel. Sketch the detailing aspects and necessary checks. 8

   b) As per I.S code , write the design steps of Flat slab 4

UNIT-III

6. a) Briefly discuss about the classification of Bridges 4

   b) Design and detail solid deck slab with simply supported ends for Two Lane R/C bridge of clear span 30m and road width 6m. Assume the slab supported on two longitudinal girders (At c/c spacing 4m). Use M30 grade concrete and Fe415 grade steel. Sketch the detailing aspects and necessary checks. Use IRC Class A loading standards 8

(OR)

7. a) Briefly discuss about highway loading standards in the design of R/C bridges as per I.R.C standards 3

   b) Design a R/C slab culvert bridge of clear span 6m , and length of bridge 14m to carry IRC class A loading standards. Use M30 grade concrete and Fe415 steel 9

UNIT-IV

8. a) Design a rectangular pile that carries a column load 750kN. Assume the pile driven into hard strata up to a depth of 8m. Design the pile and detail the reinforcement with neat sketch. Use M30 grade concrete and Fe415 steel 6

   b) A column450x450 carries axial load 800kN that supported by Four pile group arranged in square pattern. The piles are driven 8m below ground level. Assume the column load placed at centroid of pile group .The centre to centre spacing between the piles are 3.0 m. Use M30 grade concrete and Fe415 steel. Design the pile cap. 6

(OR)

9. A column 600x600mm carries axial load 1200kN that supported by three pile group arranged in equilateral triangular pattern. The piles are driven up to 10m. Assume the column spaced at centroid of pile group and the centre to centre spacing between the piles are 1.80m. Use M30 grade concrete and Fe415 steel. Design the pile and pile cap. 12

UNIT-V

10. Design a circular water tank of capacity 1x10^5 litres, that resting on firm ground with flexible connection of base. Assume the height of tank 6m. Allow free board of 150mm, Use M30 grade concrete and Fe415 steel. Use approximate or I.S code method. Neatly sketch and detail the reinforcement 12

(OR)

11. Design a rectangular water tank of size 6x5x4m (height) that resting on surface of firm ground with rigid connection base. Use M25 grade concrete and Fe415 steel. Design and detail the water tank with necessary checks. Use approximate or I.S code method. 12

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

COMPUTER ORGANIZATION AND ARCHITECTURE
(Electrical and Electronics Engineering)

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

PART-A

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

1. a) Define bus?
   b) What is register transfer language?
   c) List various shift operations?
   d) Define indexed addressing mode.
   e) Differentiate register stack and memory stack?
   f) What is the purpose of program counter?
   g) List different modes of transfer?
   h) What is demand paging?
   i) Define pipelining?
   j) What is arithmetic pipeline?

PART-B

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

UNIT-I

2. a) Discuss different functional units.   6M
   b) Explain floating point representation with an example   6M

(OR)

3. a) Explain basic operational concepts and connections between processor and memory.   6M
   b) Discuss different types of computers.   6M

UNIT-II

4. a) Design a 4- bit Arithmetic Circuit to perform all Arithmetic Operations.   7M
   b) Explain about logic micro operations.   5M

(OR)

5. a) Explain various registers connected to a common bus system?   6M
   b) Explain various instruction formats with an example.   6M

UNIT-III

6. a) Discuss in detail about memory hierarchy?   5M
   b) What is cache memory? Explain in detail about various memory mapping techniques in cache memory?   7M

(OR)

7. a) Explain the paging concept in virtual memory?   6M
   b) Explain the physical characteristics of disk system?   6M

UNIT-IV

8. a) Explain Asynchronous data transfer technique.   7M
   b) Explain briefly about peripheral devices.   5M

(OR)

9. What is IOP? Explain in detail I/O channel and processor.   12M

UNIT-V

10. What is Multi-Processor? Explain different Interconnection Structures for Multi processor systems.   12M

(OR)

11. What is Vector Processing? Explain how matrix multiplication is performed using vector Processing?   12M

AR13

Code No: 13ME3020   **SET - 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI (AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, April- 2019

HEAT TRANSFER
(Mechanical Engineering)

Time: 3 hours   **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS   **[1×10=10M]**

1. (a) State Fourier's law of heat conduction?
   (b) What is critical radius of insulation of a cylinder?
   (c) Define terms fin efficiency and effectiveness?
   (d) What is Biot number and explain its physical significance?
   (e) Differentiate between natural and forced convection?
   (f) What is significance of Grashof number in free convection?
   (g) Give the difference between film wise and drop wise condensation?
   (h) Draw the temperature profile of parallel flow heat exchanger?
   (i) Define the term shape factor in radiation?
   (j) State wine's law displacement?

PART-B

Answer one question from each Unit   **[5×12=60M]**

UNIT-I

2. a) State and explain the modes of heat transfer?   **[4 M]**
   b) Derive the general heat conduction equation for spherical coordinates?   **[8 M]**

(OR)

3. a) Derive the general heat conduction equation for Cartesian coordinates?   **[6 M]**
   b) A composite slab consist of 250 mm fire clay brick (1.09 W/m K) inside, 100 mm fired earth brick (0.26 W/m K) and outer layer of common brick (0.6 W/m K) of thickness 50 mm. If inside surface is at 1200 ^{o}C and outside surface is at 100 ^{o}C, Find the heat flux, temperature of the junctions and temperature at 200 mm from the outer surface of the wall?   **[6 M]**

UNIT-II

4. a) A hallow sphere of inside radius 4cm and outside radius 6cm is electrically heated at the inner surface at a constant rate of 105 W/m^3. At the outer surface it dissipates heat by convection into a fluid at a temperature of 100 ^{o}C and heat transfer coefficient is 450 W/m^{2}K. Thermal conductivity of solid is 20W/m K. Calculate inner and outer surface temperatures?   **[6 M]**
   b) A turbine blade 6 cm long and having cross sectional area 4.56 cm^2 and perimeter 12 cm is made of stainless steel having thermal conductivity 23.3 W/m K. The temperature at the root is 773 K. The blade is exposed to a hot gas at 1143 K. The heat transfer coefficient between the blade surface and hot gas is 442 W/m^2 K. Determine the temperature distribution and rate of heat flow at the root of the blade. Assume the tip of the blade is insulated?   **[6 M]**

(OR)

5. a) A steel ball bearings having thermal conductivity 50 W/Mk and thermal diffusivity 1.3×10^{-5} m^2/s having a diameter of 40 mm are heated to a temperature of 650 ^{o}C and then suddenly quenched in a tank of oil at 55 ^{o}C. If the heat transfer coefficient between ball bearings and oil is 300 W/m^{2}K. Determine i) the duration of time the bearing must remain in oil to reach a temperature of 200 ^{o}C ii) The total amount of heat removed from bearing during this time?   **[6 M]**
   b) What are the Heisler charts? Explain their significance in solving transient conduction problems?   **[6 M]**

UNIT-III

6. a) Explain the Buckingham's π- theorem for forced convection heat transfer analysis? **[6 M]**

   b) Assuming that a man can be represented by a cylinder 30 cm in diameter and 1.7 m high with a surface temperature of 30 ^{o}C. Calculate the heat he would lose while standing in a 36 km/h wind at 10 ^{o}C. **[6 M]**

(OR)

7. a) Explain for fluid flow over a flat plate
     i) Velocity distribution in thermodynamic boundary layer
     ii) Temperature distribution in thermal boundary layer **[6 M]**

   b) Air at a pressure of 8 KN/m2 and a temperature of 250 ^{o}C flows over a plate 0.3mm wide and 1m long at a velocity of 8 m/s. If the plate is maintained at a temperature of 78 ^{o}C, estimate the rate of heat to be removed continuously from the plate? **[6 M]**

UNIT-IV

8. a) Explain the concept of hydrodynamic and thermal boundary layer and sketch temperature and velocity profiles in natural convection **[6 M]**

   b) Distinguish between filmwise and dropwise condensation. Which of the two gives a higher heat transfer coefficient why? **[6 M]**

(OR)

9. a) Derive LMTD expression for counter flow heat exchanger **[6 M]**

   b) A refrigerator is designed to cool 250 kg/h of hot liquid of specific heat 3350 J/kg K at ^{o}C using parallel flow arrangement. 1000 kg/h of cooling water is available for cooling purpose at a temperature of 10 ^{o}C. If the overall heat transfer coefficient is 1160 W/m^{2}K and the surface area of the heat exchanger is 0.25 m^2. Calculate the outlet temperatures of cooled liquid and water and effectiveness of the exchanger. **[6 M]**

UNIT-V

10. a) State and explain Plank 's Distribution law **[5 M]**

    b) A pipe carrying steam having an outside diameter of 20 cm runs in a large room and is exposed to air at a temperature of 30 ^{o}C. The pipe surface temperature is 400 ^{o}C. Calculate the loss of heat to surroundings per meter length of pipe due to thermal radiation. The emissivity of the pipe surface is 0.8. What would be the loss of heat due to radiation if the pipe is enclosed in a 40 cm diameter brick conduit of emissivity 0.91? **[7 M]**

(OR)

11. a) Define radiation intensity . Prove that the intensity of radiation is given by $I_b=E_b/\pi$ **[6 M]**

    b) Two very large parallel planes with emissivities 0.25 and 0.7 exchange heat by radiation Find the percentage reduction in heat transfer when polished aluminum radiation shield of emissivity 0.05 is placed between them. **[6 M]**

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

VLSI DESIGN
(Electronics & Communication Engineering)

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

PART-A

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

1. a) What is switch logic?
    b) What is the care to be exercised in implementing Boolean expressions with MOS switch-based logic circuits?
    c) What is the type of Silicon used to fabricate ICs and the required purity in it?
    d) Define the figure of merit for MOS transistor and specify the equation.
    e) What are the β values used for different scaling models?
    f) Define observability and controllability.

    g) What is body effect and how it can be minimized?
    h) Sketch the stick diagram for CMOS two-input XOR gate.
    i) Define sheet resistance?
    j) State the function of transmission gate.

PART-B

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

UNIT-I

2. a) Explain the CMOS twin tub mode fabrication process with the help of diagram.   8 M

    b) Present the speed/power performance of the available IC technologies.   4 M
                                              (OR)
3. a) With the help of circuit diagram and waveforms discuss the voltage transfer   6 M
        characteristics of CMOS inverter.
    b) What is threshold voltage of a MOS transistor? What are the factors that determine   6 M
        the threshold voltage of it?

UNIT-II

4. a) Explain the operation of BiCMOS inverter.   6M
    b) Compare NMOS inverter with CMOS inverter.   6M
                                              (OR)
5. a) Differentiate the parameters of CMOS and Bipolar technologies.   6M
    b) Explain the transfer characteristics of a CMOS inverter.   6M

UNIT-III

6. a) Draw layout diagram for NMOS Ex NOR gate.   6M
    b) Draw a stick diagram for the CMOS logic Y= (ab)'(cd)'.   6M
                                              (OR)
7. a) With a neat diagram explain VLSI design flow.   6M
    b) Discuss the lambda-based design rules for i) wires   ii) transistor   6M

UNIT-IV

8. a) List three sources of wiring capacitances. Explain the effect of wiring capacitances on the performance of a VLSI circuit.   6M

   b) Explain the working of dynamic CMOS logic along with its advantages and disadvantages.   6M

(OR)

9. a) Sketch the CMOS implementation of 4×1 MUX using transmission gates.   4M

   b) Give the structural design for a parity bit generator whose stages are cascadable.   8M

UNIT-V

10. a) Explain how the cost of chip can be affected with the testing levels?   6M

    b) Explain any **Two** i) BIST ii) Boundary scan test iii) ATPG.   6M

(OR)

11. a) Explain the concept of design for testability.   6M

    b) Explain any **Two** prominent design verification tools used in designing chips.   6M

AR13

CODE: 13CS3018   **SET-1**

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

COMPUTER GRAPHICS
(Computer Science & Engineering)

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

PART-A

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

1. a) What is pixel?
    b) What are the types of display devices?
    c) What are the properties of ellipses?
    d) Define Boundary fill algorithm?
    e) Define Scaling transformation?
    f) Define clipping algorithm and types of clipping?
    g) Define interpolation and approximation splines?
    h) Write viewing parameters in 3D graphics
    i) What is a key frame in animation?
    j) Name the three types of animation languages.

PART-B

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

UNIT-I

2. a) Explain refresh cathode ray tube.   6m
    b) Explain color CRT monitors   6m

(OR)

3. a) Write any four applications of computer graphics.   6m
    b) Compare two technologies available with CRT displays (Raster scan and Random   6m
        scan)

UNIT-II

4. Scan convert a line from (1,2) and (8,4) using Bresenham's algorithm.   12m

(OR)

5. Explain Mid-point Circle Algorithm with an example.   12m

UNIT-III

6. a) write rotation transformation matrices and rotate a polygon A(0,0), B(1,1), C (5,3)   6m
        about the origin 45° in clockwise direction.
    b) Prove two successive translation matrices multiplication operation is commutative   6m

(OR)

7. a) Adapt the Cohen Sutherland line clipping algorithm to line clipping.   6m
    b) Explain viewing pipeline.   6m

UNIT-IV

8. a) What is view volume? Explain 3D clipping.   6m
    b) What are the various techniques in parallel projections?   6m

(OR)

9. a) Explain in detail about Bezier curves.   6m
    b) Discuss about 3-D transformations translation and scaling   6m

UNIT-V

10. Discuss about backface method & BSP-tree method   12m

(OR)

11. a) Explain the Animation design sequence & computer programming languages used   6m
        in animation.
    b) Explain about computer animation functions & key frame systems   6m