AR 13

CODE: 13CE3018 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July- 2018

TRANSPORTATION ENGINEERING-II
(Civil Engineering)

Time : 3 Hours **Maximum Marks:70**

PART-A

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

1. a) Differentiate between Expansion joint and contraction joint.
   b) Draw a typical sketch of Dowel bar joint in a rigid pavement.
   c) What are the materials used in Reinforced concrete pavements?
   d) Define Surface drainage System
   e) What are the indirect benefits in a Highway project?
   f) What is IRR?
   g) What do you understand by Creep?
   h) Define a Station Yard.
   i) Mention the temperature correction for basic runway length.
   j) Define wind coverage.

PART- B

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

UNIT –I

2 a) Write the design procedure of IRC of flexible pavement design. (6m)
b) What are the types of joints provided for Rigid Pavements? Explain with the help of neat sketches (6m)

(OR)

3 a) Design a suitable concrete pavement of Size 4.5m x 3.5 m as per IRC: 58-1989 situated at Andhra Pradesh, for a design wheel load of 5100 Kg and tyre pressure of 7 kg/cm2. The modulus of sub grade reaction is 8.0 Kg/ cm3. The forecasted traffic intensity at the end of design life is 1000 CV/day. Assume other parameters wherever necessary. (6m)
b) Differentiate between IRC method and AASHTO method of Flexible pavement design .(6m)

UNIT –II

4 a) What are the materials used in the construction of Reinforced Cement concrete roads? Write the construction procedure of Reinforced Cement concrete roads. (6m)
b) With the help of neat sketches explain the typical failures in Flexible Pavements. (6m)

(OR)

5 a) Write the design procedure of Sub- Surface Drainage System for a highway. (6m)
b) Write the construction procedure of Longitudinal Joint in Rigid Pavement. (6m)

AR 13

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UNIT -III

6 a) What are the direct and indirect benefits in a highway Project. Explain each (6m)
b) Explain clearly about NPV method of Economic Analysis. (6m)

(OR)

7 a) Explain the Benefit –Cost ratio method with a suitable example. (6m)
b) Write a short notes on Highway Finance in India. (6m)

UNIT –IV

8 a) What are the components of a Permanent Way. Indicate all component parts with a suitable sketch. explain the requirements of each component. (6m)
b) What are the requirements of Rails and Rail Joints in a Railway Track? (6m)

(OR)

9 a) Draw a neat sketch of Left Hand Turnout. Explain the working principle of it. (6m)
b) Explain various types of signals used in railways. (6m)

UNIT –V

10 a) Explain Briefly about the following : (6m)
i) Apron ii) Taxi Way
b) How the runway is oriented ? Explain with the help of neat sketches. (6m)

(OR)

11 a) Write a short notes on the Runway Lighting System. (6m)
b) Calculate the actual runway length for the following data: (6m)
Basic Runway length : 2100 m
Elevation of the airport above MSL = 700 m
Airport reference temperature = $38.5^{O}C$
Effective Gradient of the runway = 1.0%

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AR13

CODE: 13CS3009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2018

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) What is synchronous modes of data transfer
   b) Convert $(101.11011)_2$ into Hex
   c) What is the last Instruction to get back from Interrupt program
   d) Discuss about fixed point representation
   e) What is paging?
   f) Why memory hierarchy is important in computer system?
   g) What is instruction cycle
   h) What is the use of ALU in computer
   i) Why we need cache memory
   j) Give one example of optical memory.

PART-B

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

UNIT-I

2. a) What is the computer? With neat sketch explain about the functional block diagram of the computer? 6
   b) What is Data Representation? Explain floating-point representation with examples. 6

(OR)

3. a) Explain the different types of computers 6
   b) What is fixed point Representation? Explain with examples 6

UNIT-II

4.	a)	What is Micro operation? Briefly explain the arithmetic micro operations?	6
	b)	Explain the organization of registers.	6
		(OR)	
5.	a)	With block diagram of a register, explain few register transfer language operations?	6
	b)	Draw the block diagram of arithmetic logic shift unit and explain its operations	6

UNIT-III

6.	a)	Discuss about set-associative mapping	6
	b)	Explain about Magnetic disc memory?	6
		(OR)	
7.	a)	Explain about cache direct memory mapping?	6
	b)	Discuss about the virtual memory? Discuss about the mapping of virtual address to Memory table.	6

UNIT-IV

8.		How the data transfer to and from peripherals is done? Discuss with neat Diagrams and examples.	12
		(OR)	
9.	a)	With a neat sketch explain the working principle of DMA	6
	b)	Draw the block diagram for asynchronous communication interface	6

UNIT-V

10.	a)	Explain the characteristics of multiprocessors	6
	b)	What do you mean by inter process arbitration? Explain how it is implemented in multiprocessor architecture	6
		(OR)	
11.	a)	Explain Symmetric Multiprocessors?	6
	b)	Explain RISC.	6

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AR13

CODE: 13ME3020 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2018

HEAT TRANSFER

(Mechanical Engineering)

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

PART-A

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

1. a) Define thermal conductivity
   b) Define Stefan Boltzmann law
   c) Write the expression for critical radius of insulation for sphere in terms of thermal conductivity 'k' and heat transfer coefficient 'h'
   d) Define the effectiveness of fin
   e) Define thermal diffusivity
   f) what the significance of Nusselt number
   g) Mention the difference between boiling and condensation
   h) Sketch the temperature variations of fluids in an evaporator
   i) Define black body
   j) Define the tem radiosity

PART-B

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

UNIT-I

2. a) Derive the general heat conduction equation in Cartesian coordinates and deduce it in one dimensional steady state conduction with no internal heat generation. 8M
   b) Sheets of brass and steel each of thickness 1 cm, are placed in contact. The outer surface of brass is kept at 100^0C and the outer surface of steel is kept at 0^0C. What is the temperature of the common interface? The thermal conductivities of brass and steel are in the ratio 2:1 4M

(OR)

3. a) State Fourier's law of heat conduction. Why is the negative sign used 4M
   b) Derive, starting from fundamentals, general heat conduction equation in cylindrical coordinates. 8M

UNIT-II

4. a) Nichrome having resistivity of 100μΩ- cm is to be used as a heating element in a 10 kW heater. The Nichrome surface temperature should not be exceed 1220^0 C. Surrounding air temperature is 20^0C, outside surface coefficient 1.15 kW/m^2K. Thermal conductivity of Nichrome is 17 W/mK. Find out what diameter Nichrome wire is necessary for 1 meter long heater.. 7M
   b) One end of a very long aluminium rod is connected to a wall at 140^0C, while the other end protrudes into a room whose air temperature is 15^0C. The rod is 3 mm in diameter and heat transfer coefficient between rod surface and environment is 300 W/m^2K. Estimate the total heat dissipated by the rod taking its thermal conductivity as 150 W/mK 5M

(OR)

5. a) Prove that the temperature distribution in a body at time t during a Newtonian heating or cooling is given by $\frac{T-T_\infty}{T_i-T_\infty} = e^{-Bi\,Fo}$ 6M

   b) A 40 × 40 cm copper slab 5mm thick at a uniform temperature of 250^0 C suddenly has its surface temperature lowered to 30^0C. Find the time at which the slab temperature becomes 90^0C. Take ρ = 9000 kg/m^3,C_p =380 J/kg K , k = 370 W/mK and h = 90W/m^2K. 6M

UNIT-III

6. Air at 10^0C and at pressure of 100 kPa flowing over a plate at a velocity of 3 m/sec. If the plate is 30 cm wide and at a temperature of 60^0C. Calculate the following quantities at x = 0.3 m. (i) Boundary layer thickness (ii) Local friction coefficient (iii) Local shear stress (iv) Total drag force (v) Thermal boundary layer thickness (vi) Local convective heat transfer coefficient (vii) Heat transfer rate from the plate. 12M

(OR)

7. Water at 50^0C enters a 1.5 cm diameter and 3 m long tube with a velocity of 1 m/sec. The tube wall is maintained at a constant temperature of 90^0C. Calculate the heat transfer coefficient and the total amount heat transferred if the exit water temperature is 64^0C 12M

UNIT-IV

8. a) It is desired to generate 100 kg/h of saturated steam at 100^0 C using a heating element of copper of surface area 5m^2. Calculate the temperature of heating surface. 6M

   b) A Square array of 400 tubes 15 mm outer diameter is used to condense steam at atmospheric pressure. The tube walls are maintained at 88^0C by a coolant flowing through the tubes. Calculate the average heat transfer coefficent. 6M

(OR)

9. a) Derive the expression for LMTD in case of Counter flow heat exchanger. 7M

   b) Water enters a counter flow, double pipe heat exchanger at 15^0C, flowing at the rate of 1300 kg/h. It is heated by oil (C_p = 2000 J/kg K) flowing at the rate of 550 kg/h from the inlet temperature of 94^0C. For an area of 1 m^2 and an overall heat transfer coefficient of 1075 W/m^2 K, determine the total heat transfer and the outlet temperatures of water and oil. 5M

UNIT-V

10. Two large parallel planes having emissivities 0.3 and 0.5 are maintained at temperatures of 900^0C and 400^0C respectively. A radiation shield having an emissivity of 0.05 is placed between the two planes, workout
    (a) Heat exchange per m^2 area if the shield was not present
    (b) heat exchange per m^2 when the shield is present 12 M

(OR)

11. a) Assuming sun's surface temperature as 5800 K, assuming sun as black surface, calculate (i) λ_{max} (ii) $e_b\lambda$ at $\lambda = \lambda_{max}$ (iii) e_b 6M

    b) A pipe carrying steam having and outside diameter of 20 cm runs in a large room and is exposed to air at a temperature of 30°C. The pipe surface temperature is 400°C. 6M
    i) 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.
    ii) 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?.

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AR13

CODE: 13EC3021 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2018

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 masking?
   b) Draw the circuit symbol for enhancement PMOS transistor?
   c) What is transcconductance?
   d) What are the pass characteristics of nmos pass transistor?
   e) What are lambda based design rules?
   f) What is meant by butting contact?
   g) Define area capacitance of layers?
   h) What is the disadvantage of ripple carry adder?
   i) What is the need for CMOS testing?
   j) What are the pass characteristics of CMOS transmission gate?

PART-B

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

UNIT-I

2. a) Explain VLSI design flow with necessary diagrams. 6M
   b) Draw the MOS transistor circuit model? Give the justification for all the capacitances? 6M

(OR)

3. a) Explain the nmos fabrication in detail. 6M
   b) Explain the steps involved in Bicmos technology fabrication. 6M

UNIT-II

4. a) Explain about latchup effect in CMOS circuit. 6M
   b) Explain any three forms of pull up elements. Draw its voltage transfer characteristic. 6M

(OR)

5. a) Derive the expression for pullup to pulldown ratio for an nmos inverter driven by another nmos inverter through pass transistor. 6M
   b) Draw the circuit diagram of Bicmos nandgate and explain the operation. 6M

UNIT-III

6. a) Design inverter using CMOS and draw stick diagram. 6M
   b) Draw layout diagram for CMOS noninverting buffer. 6M

(OR)

7. a) What is scaling? Derive the scaling factors for device parameters using combined V and D model? 8M
   b) Explain design rules with neat diagrams. 4M

UNIT-IV

8. a) Implement 1-bit adder cell and also implement all the logical functions using 1-bit adder cell. 6M
   b) Implement carry skip adder and write the advantages of it. 6M

(OR)

9. a) Explain sheet resistance concept of MOS transistor and apply sheet resistance concept to NMOS and CMOS inverters. 6M
   b) Derive the expression for rise time delay and fall time delay of cmos inverter? 6M

UNIT-V

10. a) Explain the ASIC design flow with neat diagram? 6M
    b) Explain about design capture tools? 6M

(OR)

11. a) Explain about different approaches in design for testability? 8M
    b) What are the applications of chip level test techniques? 4M

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AR13

SUB CODE: 13CS3018 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July- 2018

COMPUTER GRAPHICS
(Computer Science Engineering)

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

PART-A

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

1. a. Define Persistence.
   b. What is aspect ratio?
   c. What is Display file?
   d. List various display devices?
   e. What is Clipping?
   f. Define viewing pipeline.
   g. What is oblique projection?
   h. Define cubic curve.
   i. List Animation languages?
   j. What is windowing?

PART-B

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

UNIT-I

2. a) Explain Raster Scan display system. [6M]
   b) Write short notes on Display File structure. [6M]

(OR)

3. a) What is CRT? Explain its working with neat sketch? [6M]
   b) Explain briefly about architecture of Random Scan System. [6M]

UNIT-II

4. Explain Bresenhams Line Generation Algorithm with example. [12M]

(OR)

5. a) Illustrate simple DDA with example. [6M]
   b) Explain Normalized Device Coordinates. [6M]

UNIT-III

6. a) Explain Basic 2D Transformations – Scaling, Rotation and Translation. [6M]
   b) Explain Window to Viewport transformation. [6M]

(OR)

7. Explain Cohen Sutherland Line clipping algorithm. [12M]

UNIT-IV

8. a) Derive the matrix for general parallel projection. [6M]
   b) Write the properties of Bezier curves. [6M]

(OR)

9. a) Discuss briefly about classification of projections. [6M]
   b) Derive the blending functions of a cubic Bezier curve. [6M]

UNIT-V

10. a) Discuss Painter's Algorithm. [6M]
    b) Discuss Scanline algorithm for surface detection. [6M]

(OR)

11. a) Discuss different Animation functions. [6M]
    b) Discuss briefly about morphing. [6M]

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