AR13

CODE: 13CE3018 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEMESTER REGULAR EXAMINATIONS, MAY-2016

TRANSPORTATION ENGINEERING - II
(CIVIL ENGINEERING)

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

PART-A

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

1 a) Define ESWL.
b) Give an example for rigid pavement.
c) What is tack coat?
d) What is overlay for pavements?
e) Draw a cross section of permanent way?
f) What are different gauges of railways?
g) What are various costs related to highway project?
h) What is the purpose of railway yard?
i) What is runway?
j) What is the purpose of Apron in airport?

PART-B

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

UNIT-I

2. (a) Explain AASHO method of flexible pavement design. (6M)

(b) Explain the following. (6M)
i) Interior loading
ii) Edge loading
iii) Corner loading

(OR)

3. (a) Write in detail about flexible pavement with a neat sketch (7M)
(b) Compute radius of relative stiffness of 15cm thick cement concrete slab from following data: (5M)
Modulus of elasticity of cement concrete E=2.1x10^5 kg/cm2
Thickness of slab (h)=30cm
Poisson's ratio μ=0.15
When (i) K=30 kg/cm2
(ii) K=75 kg/cm2

UNIT-II

4. (a) Briefly explain about gravel road construction (6M)
(b) What is the importance of highway drainage? (6M)

(OR)

5. (a) Explain briefly about failures of rigid pavements with neat sketch (6M)
(b) Briefly explain about cement concrete road construction (6M)

UNIT-III

6. (a) Explain about highway financing. (6M)
(b) Discuss about various benefits for highway projects (6M)

(OR)

7. Write about the methods of economic evaluation of highway project. (12M)

UNIT-IV

8. (a) explain briefly about various theories related to creep (6M)
   (b) What are requirements of good rail? (6M)

(OR)

9. (a) Discuss about sleeper density (7M)
   (b) What is the adzing of sleepers (5M)

UNIT-V

10. (a) Discuss about the factors affecting airport site layout (6M)
    (b) Explain about runway lighting (6M)

(OR)

11. The data given below refers to the direction, duration and intensity of wind at a particular site over a period of 8 years. Draw the two types of wind rose diagrams. Determine the calm period, and orientation of runway from each type. Determine the percentage of time in year during which this runway can be used with satisfactory wind conditions. (12M)

	% OF TIME WITH VELOCITY IN KMPH			
DIRECTION	6.4-25	25-35	35-55	55-80
N	7.8	2.7	1.6	0.2
NNE	5.1	2.1	0.8	0.1
NE	2.4	0.9	0.6	0.0
ENE	1.2	0.4	0.2	0.0
E	0.8	0.2	0.9	0.0
ESE	0.3	0.1	0.0	0.0
SE	2.3	1.8	0.9	0.1
SSE	4.5	3.0	1.0	0.2
S	6.7	5.6	2.9	0.1
SSW	4.8	2.7	1.3	0.1
SW	1.6	0.8	0.3	0.0
WSW	2.2	0.6	0.1	0.0
W	0.4	0.1	0.0	0.0
WNW	0.2	0.1	0.0	0.0
NW	2.3	1.8	0.9	0.2
NNW	4.0	3.2	1.3	0.1

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AR13

CODE: 13CS3009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

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 cache coherence protocol?
   b) What is opcode?
   c) What is Fetch cycle?
   d) What is Interrupt?
   e) What is Micro Operation?
   f) What is multitasking?
   g) What is locality of Reference?
   h) What is index register?
   i) Define PSW?
   j) What is System Bus?

PART-B

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

UNIT-I

2. a) Explain the Basic Organization of a Computer? 6M
   b) Explain history of computers? 6M

(OR)

3. a) Explain the major building blocks of a computer? 6M
   b) Explain Floating Point Representation? 6M

UNIT-II

4. a) Construct a basic 4 bit Arithmetic circuit for performing basic arithmetic micro operations? 8M
   b) Explain different Computer registers? 4M

(OR)

5. a) What is addressing mode and discuss different addressing modes? 6M
   b) What is instruction format and discuss different instruction formats? 6M

UNIT-III

6. Examine Associate Memory? 12M

(OR)

7. Discuss the three types of mapping procedures exist in cache memory organization? 12M

UNIT-IV

8. a) What is Input-output Interface? What are the major differences that exist between CPU and Peripherals? 6M
   b) Explain Direct Memory Access? 6M

(OR)

9. a) Explain Daisy chaining Priority? 6M
   b) Explain Programmed I/O with an example? 6M

UNIT-V

10. Analyze how pipelining can improve the performance of a computer? 12M

(OR)

11. What is Flynn's Classification? Analyze how an array processor performs computations? 12M

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AR13

CODE: 13ME3020 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEMESTER REGULAR EXAMINATIONS, MAY-2016

HEAT TRANSFER
(MECHANICAL ENGINEERING)

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

PART-A

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

1. a) What is Fourier's Law of heat conduction?
   b) What is Poisson's equation for heat flow?
   c) What is critical radius of insulation;
   d) Define effectiveness of the fin.
   e) What is meant by transient heat conduction?
   f) What is meant by periodic heat transfer?
   g) State Buckingham's л-theorem.
   h) Define thermal boundary layer thickness.
   i) Define skin friction coefficient.
   j) Define Displacement thickness.

PART-B

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

UNIT-I

2. a. Derive the heat conduction equation in cylindrical co-ordinates using an elemental volume for a stationary isotropic solid. 4
   b. A 6 cm long copper rod (k = 300 W/mK) 6mm in diameter is exposed to an environment at 20 ^{0}C. The base temperature of the rod is maintained at 160^{0}C. The heat transfer co-efficient is 20 W/m^{2}K. Calculate the heat given by the rod, efficiency and effectiveness of the rod. 8

(OR)

3. a State the basic laws of heat transfer for three modes of heat transfer. 4
   b Consider a plane composite wall that is composed of two materials of thermal conductivity k_A = 0.1 W/mK and k_B = 0.04 W/mK. The thickness of material A and B are 10 cm and 20 cm respectively. The constant resistance at the interface between the two materials is known to be 0.3 m^{2}K/W. Material A adjoins a fluid at 200 ^{0}C for which h = 10 W/m^{2}K and material B adjoins a fluid at 40 ^{0}C for which h = 20 W/m^{2}K. What is the rate of heat transfer through the wall that is 2 m height and 2.5 m wide? Also sketch the temperature distribution. 8

UNIT-II

4. a What do you understand by 'lumped system analysis'? derive an expression for temperature distribution in a body during Newtonian heating or cooling. 6
   b A steel ball of 5 cm diameter initially at a uniform temperature of 450 ^{0}C is suddenly placed in an environment at 100 ^{0}C. Heat transfer coefficient between the steel ball and the fluid is 10 W/m^{2}K. For steel c_p = 0.46 kJ/kgK, density = 7800 kg/m^3, k = 35 W/mK. Calculate the time required to reach a temperature of 150 ^{0}C. also find the rate of cooling after 1hr. 6

(OR)

5. a With neat sketches, explain the different fin profiles. 4
   b Aluminium fins, 1.5 cm long and 1 mm thick are placed on a 2.5 cm diameter tube to dissipate heat. The tube surface temperature is 100 ^{0}C and the ambient temperatureis 30 ^{0}C. Find the heat loss per fin if the heat transfer coefficient between the fin surface and the ambient is 65 W/m^{2}K. Assume k = 200 W/mK for aluminium. 8

UNIT-III

6. a State the scope and application of dimensional analysis in heat transfer processes. What are the two methods of determining dimensionless groups to correlate experimental data? 6

   b For the flow over a slightly curved surface, the local shear stress is given by the relation $\tau_w(x) = 0.3\left(\frac{\rho\mu}{x}\right)^{0.5} u_\infty^{1.5}$. Obtain non-dimensional relations for the local and average friction coefficients. 6

(OR)

7. a Draw and explain the temperature variation of a fluid along the flow direction for constant heat flux boundary condition. 4

   b Air at 20 ^{0}C flows over a plate 60 cm × 30 cm with a velocity of 20 m/s. The critical Reynolds number is 5×10^5. Calculate the rate of heat transfer from the plate, assuming the flow to be parallel to the 60 cm side. The plate temperature is maintained at 100 ^{0}C. Properties of air at 60 ^{0}C are ρ = 1.06 kg/m^3, c_p = 1.005 kJ/kgK, $\gamma = 18.97 \times 10^{-6}$ m^2/s and k = 0.0291 W/mK. 8

UNIT-IV

8. a Find the location and magnitude of maximum velocity in the boundary layer formed on a heated or cooled vertical plate 4

   b A wall of a cold storage having an air gap is 6 m high and 11 m wide. The air gap width is 2.5 cm. If the two wall surfaces across the air gap have temperatures of 45 ^{0}C and 35 ^{0}C, find the heat gain by natural convection and conduction through the air gap. 8

(OR)

9. a What do you mean by sub cooled boiling and saturated boiling? 4

   b A counter flow heat exchanger is employed to cool 0.55 kg/s (c_p = 2.45 kJ/kgK) of oil from 115 ^{0}C to 40 ^{0}C by the use of water. The inlet and outlet temperatures of cooling water are 15^{0}C and 75 ^{0}C respectively. The overall heat transfer coefficient is expected to be 1450 W/m^{2}K. Using the NTU method, calculate the following
   i. the mass flow rate of water, ii. The effectiveness of the heat exchanger, iii. The surface area required. 8

UNIT-V

10. a What is a gray body? How does spectral emissivity vary for gray body and for normal surface? 4

   b A domestic hot water tank (0.5 m diameter and 1 m high) is installed in a large space. The ambient temperature is 25 ^{0}C. If the tank surface is oxidized copper with an emissivity of 0.8, find the heat loss from the tank surface at temperature 80 ^{0}C by radiation. What would be the reduction in heat loss if a coating of aluminium paint having an emissivity of 0.3 is given to the tank? What would be the increase in heat loss if a white paint having an emissivity of 0.97 is given to the tank? 8

(OR)

11. a Explain Kirchhoff's law. What do you understand by the statement: " A perfect absorber of radiant energy is also a perfect emitter" 4

   b Determine the shape factor F_{12} between a small area A_1 and a parallel circular disc A_2. A_1 is located on the axis of the disc and the semi vertex angle of the cone formed with the disc as base and A1 as the vertex is α. 8

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AR13

CODE:13EC3021 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.TECH II SEMESTER REGULAR EXAMINATIONS, MAY-2016

VLSI DESIGN

(ELECTRONICS & COMMUNICATION ENGINEERING)

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

PART-A

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

1. a) What are pull up and pull down networks?
   b) Draw the circuit of nMOS inverter and state its any two features.
   c) List the sources of capacitance which contribute to the overall wiring capacitance.
   d) Draw the circuit of an alternative BiCMOS inverter with no static current flow.
   e) Define regularity in the design of VLSI system.
   f) Draw the stick diagram for nMOS NOR gate.
   g) State Moore's law.
   h) State the importance of VLSI testing.
   i) Define the process of photolithography.
   j) In which multiplier propagation delay is reduced for larger multiplications?

PART-B

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

UNIT-I

2. a) Explain the fabrication process steps of NMOS with a neat diagram. 8M
   b) Compare CMOS and Bipolar technologies. 4M

(OR)

3. a) Explain the CMOS fabrication in P-well process with a neat diagram. 6M
   b) Describe the Oxidation in IC production process . 6M

UNIT-II

4. a) Determine the pull-up to pull-down ratio for an nMOS inverter driven by another nMOS inverter. 6M
   b) Draw and explain the operation of BiCMOS inverter that produces better output logic levels. 6M

(OR)

5. a) Illustrate the relationship between I_{ds} and V_{ds} of MOSFET. 6M
   b) Illustrate CMOS inverter DC characteristics and obtain the relationship for output voltage at different regions in the transfer characteristics. 6M

UNIT-III

6. Explain the limitations of scaling due to 12 M
   i) Substrate doping ii) Miniaturization
   iii) Interconnects iv) Subthreshold currents.

(OR)

7. a) Sketch a stick and layout diagram diagram for CMOS NOR gate. 6M
   b) With a neat diagram, explain λ based design rules for contact cuts and vias. 6M

AR13

CODE: 13EC3021 **SET-2**

UNIT-IV

8. Define inverter delay. Derive it for an CMOS inverter using rise and fall time models. 12 M

(OR)

9. a) Explain clocked CMOS logic and domino logic logic with examples. 6M
   b) Derive the expressions for sheet resistance? Calculate R_s for NMOS and CMOS inverters 6M

UNIT-V

10. a) Explain the basic VLSI testing approach. 6M
    b) Explain the test principles to be considered at the time of manufacturing chip. 6M

(OR)

11. a) Discuss the practical guidelines for testability of VLSI circuits and systems. 6M
    b) Briefly discuss chip level test techniques. 6M

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AR13

CODE: 13CS3018 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEMESTER REGULAR EXAMINATIONS, MAY-2016

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 Frame Buffer?
   b) What are different types of Techniques used for producing color displays?
   c) Abbreviate DDA algorithm.
   d) List the different types of Polygons?
   e) Give 2D Transformation matrix for X-Shear.
   f) What is a Viewing Transformation?
   g) List the different types of Line clipping algorithms.
   h) Define Oblique Projection ?
   i) What are the basic functions of Painters algorithm ?
   j) List the categories of computer Animation languages?

PART-B

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

UNIT-I

2. Briefly explain about the working of CRT with a neat diagram. [12M]

(OR)

3. a) Describe about Random scan display system. [6M]
   b) Explain the architecture of raster display. [6M]

UNIT-II

4. a) Write the DDA Line drawing algorithm. [6M]
   b) Generate a Line between (0,0) and (4,6) using DDA Algorithm. [6M]

(OR)

5. Write the algorithms for Flood Fill and Boundary Fill. Explain the differences between them [12M]

UNIT-III

6. a) Show that the composition of two rotation is additive by concatenating the matrix representations for $R(\square_1)\ R(\square_2) = R(\square_1+\square_2)$ [6M]
   b) Derive the Window-to-Viewport Transformation. [6M]

(OR)

7. a) Derive the transformation matrix for reflection about Y=mX + C. [6M]
   b) Write and explain the Mid-point Subdivision Method for Line Clipping. [6M]

UNIT-IV

8. a) Derive the blending function of a cubic Bezier curve. [6M]
   b) List the properties of B-spline curve. [6M]

(OR)

9. Derive the Transformation matrix of general Parallel projection on xy- plane [12M]

UNIT-V

10. a) Explain about scanline algorithm [6M]
    b) Describe the Warnock's algorithm. [6M]

(OR)

11. a) Write about various computer languages for animations. [6M]
    b) Briefly write about morphing in computer animations. [6M]

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AR13

CODE: 13IT3003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH II SEMESTER REGULAR EXAMINATIONS, MAY-2016

OBEJECT ORIENTED ALANLYSIS AND DESIGN
(INFORMATION TECHNOLOGY)

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

PART-A

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

1. a) Why the term unified is in UML?
   b) Define use case and actor.
   c) What is dependency?
   d) How will you analyze a use case?
   e) What is the use of interaction diagram?
   f) Define control nodes.
   g) What are nested classes?
   h) What do you mean by composition?
   i) What is the significance of deployment diagram?
   j) Define MVC.

PART-B

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

UNIT-I

2. a) Define UML? Write down the domains over which UML can be applied. 6
   b) Discuss about various types of diagrams used in UML modelling. 6

(OR)

3. a) What is unified process (UP)? Discuss about UP structure and UP phases. 6
   b) Briefly explain about actor generalization and use case generalization. 6

UNIT-II

4. a) Discuss about analysis workflow. 6
   b) Differentiate between package dependency and package generalization. 6

(OR)

5. a) What are the different analysis classes used to analyze a use case? 6
   b) Define relationship, link, association and dependency with a suitable example. 6

UNIT-III

6. a) What is the purpose of communication diagram? Explain with an example. 6
   b) Discuss about different elements of activity and interaction diagram. 6

(OR)

7. a) What are sequence diagrams? Draw the sequence diagram of a library management system. 6
   b) Discuss about activity semantics and activity partitions. 6

AR13

CODE: 13IT3003 **SET-2**

UNIT-IV

8.	a)	What are design classes? Discuss about well-formed design classes.	6
	b)	What is an interface? Differentiate between interface and inheritance.	6
		(OR)	
9.	a)	Write down about semantics of aggregation and composition. Differentiate between them also.	6
	b)	What is a component? Discuss about component stereotype.	6

UNIT-V

10.		Explain deployment diagram and its components in detail, give an example by considering any system.	12
		(OR)	
11.	a)	What do you mean by advanced state machine? Explain the terms composite states and sub machine states.	6
	b)	Briefly explain architectural implementation.	6

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