Class: SE   Branch: IT   Semester: II

Subject: Database Management System   (Code: 214452)

Maximum Marks: 30   Duration: 60 Minutes   Date: 07/04/2022

Special Instructions:
1) Question 1 OR Question 2, Question 3 OR Question 4
2) Neat diagram must be drawn whenever necessary.
3) Figure to the right side indicate full marks.

Q.No.	Question / Description	Marks	CO
1	a) State and explain the disadvantages of file processing system.	06	1
	b) Explain different data models in details.	06	
	c) Explain client server database architecture.	03	
	OR		
2	a) Differentiate between strong entity set and weak entity set.	06	1
	b) Describe the three level architecture of DBMS. Explain how it is useful for achieving data independence.	06	
	c) What is Advantages of DBMS?	03	
3	a) List different components used in E-R diagram with their meaning explain using example.	06	2
	b) Design a generalization-specialization hierarchy for a motor vehicle sales company. The company sells motorcycles which have an engine number and cost; cars which have chasis number, an engine number, seating capacity and cost; trucks which have chasis number, an engine number and cost.	06	
	c) Explain Referential Integrity Constraint.	03	
	OR		
4	a) Explain primary key and foreign key with example.	06	2
	b) Draw an E-R diagram for a hospital management system with a set of patients and a set of medical doctors. Associate with each patient a log off the various tests and examination conducted.	06	
	c) What is attribute inheritance?	03	

SPPU In-Sem Offline Examination-April 2022

Class: SE   Branch: Information Technology   Semester: II

Subject: Computer Graphics   (Code: 214453)

Maximum Marks: 30   Duration: 60 Minutes   Date: 08/04/2022

Special Instruction: Solve Q.1 OR Q.2, Q.3 OR Q.4

Q. No.	Question / Description	Marks	CO
Q.1	A) What are the different Antialiasing techniques? Explain.	05	1
	B) Derive the expression for decision parameter of Bresenham's Circle drawing algorithm.	05	1
	C) Explain Five essential GLUT functions along with syntax for each.	05	1
OR			
Q.2	A) Explain Display File structure with an example.	05	1
	B) Distinguish between Raster scan and Random scan methods.	05	1
	C) Explain OpenGL's Geometric Primitives.	05	1
Q.3	A) Compare Flood fill and Boundary fill algorithms for polygon filling.	05	2
	B) What is meant by Homogeneous Coordinates? Write transformation matrix for Translation, Scaling and Rotation in Homogeneous Coordinates system.	05	2
	C) Derive the coordinates after magnifying the triangle with vertices A(0,0), B(1,1), C(5,2) to twice of its size followed by rotation around X-axis.	05	2
OR			
Q.4	A) Why the 4-connected method is not efficient? What can be an alternative method for it?	05	2
	B) Explain Scan-Line Algorithm for polygon filling.	05	2
	C) Perform rotation of the triangle with vertices A(0,0), B(1,1), C(5,2) around point P(-1,-1).	05	2

SPPU In-Sem Offline Examination-April 2022

Class: SE   Branch Computer   Semester II

Subject: Principals of Programming Language (2019 Pattern)   Code: 210255

Maximum Marks: 30   Duration: 60 Minutes   Date: 9/4/2022

Special Instructions:
1. Solve Q1 or Q2, Q3 or Q4
2. Draw neat diagram wherever necessary
3. Assume suitable data if required.

Q. No.	Question / Description	Marks	CO
Q1			
a	What are four main programming paradigms? Which programming languages are based on these? Enlist the features of any one of these.	5	1
b	Explain Von Neumann Architecture with diagram	5	1
c	Explain the different programming language qualities?	5	1
	OR		
Q2			
a	Explain the importance of reliability and maintainability to programming languages	5	1
b	Explain the importance of build in data types. List the advantages of built in data types	5	1
c	Define the following terms: 1. Class 2. Object 3. Method 4. Sub program 5. Recursion	5	1
Q3			
a	Explain method overloading? Write a program which adds 2 integers and 3 integers by using overloaded methods for adding 2 and 3 integers respectively in C++.	5	2
b	Compare built in and primitive data types? State the primitive data type of C++ with example	5	2
c	Explain call-by-value and call-by-reference? Give example.	5	2
	OR		
Q4			
a	Explain abstract data types in C++ programming language.	5	2
b	Explain dynamic type checking. Enlist the advantages and disadvantages of Dynamic type checking.	5	2
c	List and explain any two control statement with example.	5	2

Instructions:
1. Answer any three questions Q1 or Q2 and Q3 or Q4.
2. Assume Suitable data wherever necessary.
3. Figures to the right indicate full marks.
4. Draw neat & labelled diagram wherever necessary.

Q. No.	Question / Description	Marks	CO
1	(a) Define terms Software. "Software does not wear out". Justify the statement.	5	1
	(b) Explain why waterfall model of the software engineering is not used for software development.	5	1
	(c) Differentiate between the Agile and Evolutionary process models.	5	1
	OR		
2	(a) What are the various umbrella activities applied throughout a software project?	5	1
	(b) Explain the perspective process models with diagram and suitable example.	5	1
	(c) Describe following Agile process models Extreme Programming (XP) and Feature Driven Development (FDD).	5	1
3	(a) Differentiate between requirement inception and requirement elicitation? Why requirement elicitation is difficult?	5	2
	(b) Explain about various categories of non functional requirements & their importance.	5	2
	(c) Draw a use case diagram for home security function	5	2
	OR		
4	(a) Explain importance of requirement engineering. Describe elaboration and validation tasks of requirement engineering.	5	2
	(b) What is the need of Software Requirement Specification (SRS)? List the tasks involved in SRS.	5	2
	(c) Draw a use case diagram for online movie ticket booking system.	5	2

Class: SE   **Branch**: Computer Engineering **Semester**: II

Subject : Data Structures and Algorithms   (Code: 210252)

Maximum Marks: 30   Duration: 60 Minutes   Date :5/4/2022

Special Instructions: 1. **Solve any 1 question from Q 1 and Q 2**

2. Solve any 1 question from Q 3 and Q 4

Q. No.	Question / Description	Marks	CO
1a	Define the hash function and Enlist the characteristics of a good hash function. Explain the modulo division and folding method, Mid square hash functions	5	CO1,2
1b	Explain the need of collision handling techniques and Construct a hash table with size 13 and resolve collisions using chaining . Use the modulus hash function. (key % size) For a given set of values 11, 36, 20, 88, 33, 62, 65, 89, 5, 7. State the time complexity of insert and search operation	5	CO 2
1c	Explain the term double hashing and rehashing with example	5	CO 1,2
	OR		
2a	Explain skip list with example Give applications of skip list.	5	CO 1
2b	Construct a hash table of size 10 using linear probing without replacement strategy for collision resolution. The hash function is h(x)= x % 13. Consider a slot per bucket is 1 11, 36, 20, 88, 33,62,65,89,5,7. State the time complexity of insert and search operation	5	CO 2
2c	Explain Quadratic probing collision handling technique with example	5	CO1, 2

3a	Show a steps of constructing a binary tree using two traversals
	   Inorder : 1 2 3 14 7 10 11 49 30
	   Postorder : 1 3 2 7 10 40 30 11 14
		5	CO 3

3b	Write pseudo code for non recursive postorder traversal of binary tree	5	CO 3,4
3c	Enlist the characteristics of Huffman code. Construct Huffman tree and prefix code for all characters 	Char	A	B	C	D	E	F
------	---	----	---	----	---	----
Freq	5	25	7	15	4	12		5	CO 3
	OR		
4a	Draw a binary search tree for the following data 10, 08, 15, 12, 13, 07, 09, 17, 20, 18, 04, 05 Write its inorder, preorder and postorder sequence of it	5	CO 3
4b	Explain Threaded binary tree with its node structure Show steps of Threaded Binary search tree for following sequence 50,10,30,80,60,90,120	5	CO 3
4c	Write a 'C pseudo code' to insert and search a node in binary search free.	5	CO 3,4

Maximum Marks: 30   Duration: 60 Minutes   Date: 8.4.2022

Special Instructions: Read the instructions carefully

1) Solve Question. No 1 OR Question. No 2, AND

2) Solve Question No. 3 OR Question No. 4

3) Draw figure(s) wherever necessary.

Q. No.	Question / Description	Marks	CO
Q1 a)	List and explain fundamental data types of 80386.	5	CO1
b)	What is the use of following instructions in 80836? Explain which flags gets affected with each instruction: ADC , DIV	5	CO1
c)	With the help of diagram explain 80386 application register set.	5	CO1
OR			
Q2 a)	List features of 80386.	5	CO1
b)	Explain basic blocks of 80386 architecture.	5	CO1
c)	Explain any three control transfer instructions of 80386.	5	CO1
Q3 a)	Explain 80386 processor state after reset	5	CO2
b)	Show non pipelined addressing for write cycle.	5	CO2
c)	How many debug registers are present in 80386? List and draw all of them.	5	CO2
OR			
Q4 a)	Explain the following signals of 80386: M/IO# , W/R#, READY#, D/C#, PEREQ	5	CO2
b)	Explain Control Registers of 80386.	5	CO2
c)	What is I/O mapped I/O and Memory mapped I/O of 80386	5	CO2

Class: SE   Branch : COMPUTER   Semester: III

Subject :   Engineering mathematics-III   (Code : 207003)

Maximum Marks: 30   Duration: 60 Minutes   Date : 04/04/2022

Instructions:

(1) *Attempt four questions: Q. No.1 or 2 ,Q. NO.3 or 4,*

(2) *Figures to the right indicate full marks.*

(3) *Neat diagrams must be drawn wherever necessary*

(4)*Use of electronic non-programmable calculator is allowed*

Q. No.	Question / Description	Marks	CO
Q.1) a)	Solve Any two		
1)	$(D^2 + 4D + 4)y = e^{-2x} + 2^x + 3$	5	1
2)	$(D^2 - 6D + 9)y = \dfrac{e^{3x}}{x^2}$ (By Method of variation of parameters)	5	1
3)	$(x + 1)^2 \dfrac{d^2y}{dx^2} + (x + 1)\dfrac{dy}{dx} + y = 2\sin[\log(x + 1)]$	5	1
b)	$\dfrac{dx}{dt} + y = sint$, $\dfrac{dy}{dt} + 4x = cost$, with x=0, y=1 when t=0	5	1
	OR		
Q.2) a)	Solve Any two		
1)	$(D^2 + 3D + 2)y = \sin(e^x)$	5	1
2)	$(D^2 + 9)y = \dfrac{1}{1+sin3x}$(By Method of variation of parameters)	5	1
3)	$x^2 \dfrac{d^2y}{dx^2} - 3x \dfrac{dy}{dx} + 5y = x^2 \sin(logx)$	5	1
b)	$\dfrac{dx}{y^2z} = \dfrac{dy}{x^2z} = \dfrac{dz}{y^2x}$	5	1

Q.3)	a)	Find Fourier sine transform of the function $f(x) = e^{-x}$	5	2
	b)	Find the Fourier cosine Integral representation for the function $$f(x)= \begin{cases} x^2, 0 < x < a \\ 0, x > a \end{cases}$$	5	2
	c)	Solve Any one		
	i)	Find the Z-transform , $f(k) = 4^k \sin(2k+3)$	5	2
	ii)	Find the inverse Z-transform of $\frac{z^2}{z^2+1}$	5	2
		OR		
Q.4 a)		Solve Any one		
	i)	Find the Z-transform, $f(k) = \frac{2^k}{k}, k \geq 1$	5	2
	ii)	Find the inverse Z-transform, $\frac{z^2}{\left(z-\frac{1}{2}\right)\left(z-\frac{1}{3}\right)}$, $\frac{1}{3} < |z| < \frac{1}{2}$	5	2
	b)	Obtain f(k) , given that $f(k+1) + \frac{1}{2}f(k) = (1/2)^k$ k$\geq$ 0, $f(0) = 0$	5	2
	c)	Solve the integral equation $$\int_0^\infty f(x)\cos \lambda x dx = 1 - \lambda, 0 \leq \lambda \leq 1$$ $$= 0 \qquad , \lambda \geq 1$$	5	2