

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch - SOFTWARE SYSTEMS (Five years Integrated)

PC HARDWARE & TROUBLE SHOOTING

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 Which is the part of a computer that one can touch and feel?
(i) Hardware (ii) Software
(iii) Programs (iv) Output
- 2 Which of the following Main board of a Computer?
(i) Integrated Circuit (ii) Motherboard
(iii) Processor (iv) microchip
- 3 What is the primary function of the CPU?
(i) To display images on the screen (ii) To store data permanently
(iii) To process data and execute Instructions (iv) to connect to the Internet
- 4 Which type of storage device is a hard disk?
(i) Tertiary (ii) Off-line
(iii) Primary (iv) Secondary
- 5 How many keys are on a computer Keyboard?
(i) 101 (ii) 102
(iii) 103 (iv) 104
- 6 What is the first step you should take when troubleshooting a computer problem?
(i) Restart the computer (ii) Disconnect all peripherals
(iii) call technical support (iv) check for error message
- 7 Which of the following has aspect ratio of CRT monitor?
(i) 16:9 (ii) 4:3
(iii) 16:10 (iv) 1:1
- 8 Which of the following is used for SMPS?
(i) Obtaining controlled ac power supply
(ii) Obtaining controlled dc power supply
(iii) Storage of dc power
(iv) Switch from one source to another
- 9 What keeps a record of different parts of the file that are stored in a system?
(i) File Allocation table (ii) Folder Allocation Table
(iii) Find Allocated Table (iv) Fill Allocated Table
- 10 What is the recommended method for cleaning the exterior of a laptop or desktop computer case?
(i) Use a Vacuum cleaner
(ii) Scrub with soap and water
(iii) Use a damp cloth and mild cleaning solution
(iv) Apply a layer of wax for protection

Cont...

SECTION - B (25 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 5 = 25)

- 11 a Explain the Basic computer Hardware Structure.
OR
b Describe the operation of Motherboard Controller.
- 12 a Elucidate the types of Computer Memory.
OR
b Enumerate the troubleshooting of Hard disk.
- 13 a List out and explain types and features of Keyboard.
OR
b Illustrate the working of Mouse.
- 14 a Explain the principle of working in LED Monitor.
OR
b Enumerate the SMPS Common problems and solutions.
- 15 a Describe the Replacing Laptop Battery.
OR
b Discuss about the Laptop common problem and solutions.

SECTION -C (40 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 8 = 40)

Question No. 16 is Compulsory

- 16 Enumerate the Motherboard Components.
- 17 a Elucidate the installing and uninstalling CPU.
OR
b Enumerate the installing and uninstalling Memory Modules.
- 18 a List out and explain Keyboard common problems and solutions.
OR
b Illustrate the Maintaining and Troubleshooting of Mouse.
- 19 a Explain the principle of working in LCD Monitor.
OR
b Enumerate the operation of installing SMPS.
- 20 a Describe the Features and Replacing Laptop.
OR
b Discuss about the Troubleshooting and maintaining Laptops.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch - SOFTWARE SYSTEMS (Five years Integrated)

INTRODUCTION TO MULTIMEDIA

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 Multimedia comprises of
 - (i) Audio
 - (ii) Audio and Video
 - (iii) Video
 - (iv) None of the above
- 2 _____ is basically a form of pictorial representation.
 - (i) Photography
 - (ii) Animations
 - (iii) Drawing
 - (iv) Creativity
- 3 Basic elements of Video editing are
 - (i) Capture
 - (ii) Shot
 - (iii) Timeline
 - (iv) All the above
- 4 Digital Editing is known as
 - (i) Linear Editing
 - (ii) Non-Linear Editing
 - (iii) Tape-to-tape
 - (iv) None of the above
- 5 What is the extension of MPEG Audio file?
 - (i) .mov
 - (ii) .mp4
 - (iii) .mpeg
 - (iv) .mp3
- 6 Which of the following microphone is used for lecture delivery in the class/hall?
 - (i) Lavalier
 - (ii) Noise canceling
 - (iii) shot-Gun type
 - (iv) Fiber Optical
- 7 The higher number of pixels gives us a _____ image.
 - (i) Better
 - (ii) Worst
 - (iii) Smaller
 - (iv) None of the above
- 8 Which software animation is commonly used for creating 3D models in 3D Animation?
 - (i) Adobe After effects
 - (ii) Adobe Illustrator
 - (iii) Autodesk Maya
 - (iv) Adobe Photoshop
- 9 What does the abbreviation, FPS means?
 - (i) Flick Per Scene
 - (ii) Frames Per Scene
 - (iii) Frames Per Second
 - (iv) Flick Per Second
- 10 This action allows you to save the object in the Library panel for future use.
 - (i) importing
 - (ii) Exporting
 - (iii) Convert to Text
 - (iv) Convert to Symbol

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a) What is Multimedia? Explain components of multimedia.
OR
b) Explain briefly about applications of multimedia.
- 12 a) Explain the need for compressing the video files.
OR
b) Discuss the different video file formats with its advantages.
- 13 a) Classify different audio formats with its uses.
OR
b) Explain the importance of sound card in audio editing.
- 14 a) Explain the role of the stage in 2D animation using Flash software.
OR
b) Explain the effect we get when we use the tweening tool in Flash software.
- 15 a) Explain the use of scripting in Flash.
OR
b) Explain the various components of the flash window in brief.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

Question No. 16 is Compulsory

- 16 Elucidate the different types of Animations used for making films.
- 17 a) Distinguish between Linear and Non-linear Editing techniques.
OR
b) Analyze the challenges faced by an editor if the file is not in proper format.
- 18 a) Categorize different types of sounds used in audio production for films.
OR
b) Enumerate any three open source software that helps for audio production with its advantages.
- 19 a) Compare between 2D and 3D animation with examples.
OR
b) Macromedia Flash software played a vital role in 2D Animation-Justify.
- 20 a) Analyze the role and use of Layers in Photoshop and Flash.
OR
b) Create any one web publishing layout for (scene 1) home page.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch – SOFTWARE SYSTEMS (Five year Integrated)

ANALOG AND DIGITAL ELECTRONICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

1. Which of the following binary number is equivalent to decimal number 125_{10} ?
(a) 1100001 (b) 1111101
(c) 1010001 (d) 1011001
2. What is the BCD representation of the decimal number 25?
(a) 0010 0101 (b) 1010 1101
(c) 1100 0101 (d) 0010 0110
3. XOR circuits can be constructed using
(a) OR gates only (b) AND, OR gates
(c) AND, NOT gates (d) AND, NOT and OR gates
4. Which of the following represents the Distributive Law?
(a) $A \cdot (B+C) = (A \cdot B) + (A \cdot C)$ (b) $A+A=A$
(c) $A \cdot 1=A$ (d) $A+B=B+A$
5. Half adder consists of _____ gates.
(a) XOR & AND (b) AND & NOT
(c) XOR & NOT (d) AND & OR
6. In a decoder circuit, which gate is typically used to produce the final outputs?
(a) OR gate (b) AND gate
(c) NOR gate (d) NOT gate
7. Which flip-flop is also known as a "latch" when it lacks a clock input?
(a) SR flip-flop (b) D flip-flop
(c) JK Flip-Flop (d) T flip-flop
8. A 4-bit synchronous counter is also known as a:
(a) Mod-4 counter (b) Mod-8 counter
(c) Mod-10 counter (d) Mod-16 counter
9. The output of an op-amp differentiator circuit is proportional to
(a) input voltage (b) rate of change of the input voltage
(c) integral of the input voltage (d) difference of two input voltages
10. Slew rate is defined as
(a) voltage gain of the op-amp (b) maximum rate of change of i/p voltage
(c) input impedance of the op-amp (d) maximum rate of change of o/p voltage

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

11 a Convert the binary numbers $(111011101)_2$ to octal and hexadecimal formats.

OR

b Explain in detail about types of complements.

12 a Discuss on De-morgan's Law.

OR

b Minimize the function using K-map: $F = \sum m(1, 2, 3, 5, 6, 7)$.

13 a. Compare Decoder and Encoder.

OR

b Differentiate the types of multiplexers.

14 a Distinguish between synchronous and asynchronous counter.

OR

b Elucidate on Ring counter with block diagram.

15 a Describe the concept of common-mode rejection ratio (CMRR) in op-amps.

OR

b Explain the working principle of a differential amplifier.

SECTION - C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

Question No. 16 is Compulsory

16 Discuss various number systems with example.

17 a Demonstrate the basic logic gates with truth table.

OR

b Describe the basic theorems and laws of Boolean Algebra.

18 a Explain design procedure of binary adders.

OR

b Draw and explain the types of shift register.

19 a Realize D flip-flop and T flip flop using SR flip-flop.

OR

b Explain the working of J-K flip-flop & S-R flip-flop.

20 a Discuss the design and operation of an op-amp-based adder and subtractor.

OR

b Compare the applications of integrator and differentiator circuits using op-amps.

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch - **SOFTWARE SYSTEMS (Five Years Integrated)**

CALCULUS AND ITS APPLICATIONS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	A function of the form $f(x) = mx + b$, for constants, m and b , is called a ____ a) identity function b) constant function c) linear function d) power function	K1	CO1
	2	A moving object's ____ during an interval of time is found by dividing the distance covered by the time elapsed. a) average speed b) free fall c) average rate change d) recent	K2	CO1
2	3	The geometric series with $a = \frac{1}{9}$ and $r = \frac{1}{3}$ is ____ a) $\frac{1}{6}$ b) $\frac{2}{6}$ c) $-\frac{1}{9}$ d) $\frac{1}{22}$	K1	CO2
	4	A convergent series that is not absolutely convergent is ____ a) conditionally convergent b) absolute convergent c) alternating series d) divergence	K2	CO2
3	5	A region in the plane is ____ if it lies inside a disk of the finite radius. a) closed b) bounded c) unbounded d) finite	K1	CO3
	6	The value of $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ at the point (3,0,4) is ____ a) 3 b) 2 c) 5 d) 7	K2	CO3
4	7	$M(x, y)dx + N(x, y)dy = 0$ is called an/a ____ a) implicit solution b) contour lines c) general solution d) exact differential equation	K1	CO4
	8	Which of the following is another word for perpendicular? a) contour lines b) angle of intersection c) orthogonal d) orthonormal	K2	CO4
5	9	If $f(x)$ is an even function, then ____ a) $f(x) = -x$ b) $f(-x) = -f(x)$ c) $f(-x) = f(x)$ d) $f(-x) = x$	K1	CO5
	10	The smallest positive period is often called the ____ a) fundamental period b) partial sums c) coefficients d) periodic function	K2	CO5

SECTION - B (35 Marks)

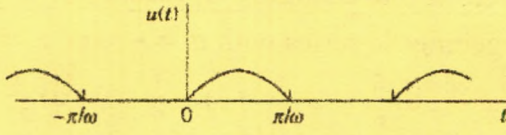
Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	If $f(x) = \sqrt{x}$ and $g(x) = x + 1$, find i) $(f \circ g)(x)$ ii) $(g \circ f)(x)$ iii) $(f \circ f)(x)$ iv) $(g \circ g)(x)$	K2	CO1
		(OR)		
	11.b.	Evaluate $\lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 100} - 10}{x^2}$.		

Cont...

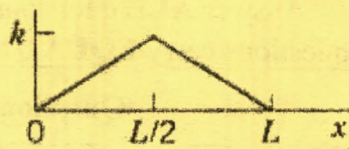
2	12.a.	Show that the sequence $\{1, -1, 1, -1, 1, -1, \dots, (-1)^{n+1}, \dots\}$ diverges.	K3	CO2
	(OR)			
	12.b.	Investigate the convergence of the following series: i) $\sum_{n=0}^{\infty} \frac{2^n+5}{3^n}$ ii) $\sum_{n=1}^{\infty} \frac{(2n)!}{n!n!}$		
3	13.a.	Use the Chain Rule to find the derivative of $w = xy$ with respect to t along the path $x = \cos t$, $y = \sin t$. What is the derivative's value at $t = \frac{\pi}{2}$?	K3	CO3
	(OR)			
	13.b.	Find the derivative of $f(x, y) = xe^y + \cos(xy)$ at the point $(2, 0)$ in the direction of $v = 3i - 4j$.		
4	14.a.	Solve the logistic equation $y' = Ay - By^2$.	K4	CO4
	(OR)			
	14.b.	Solve the equation $\cos(x + y)dx + (3y^2 + 2y + \cos(x + y))dy = 0$.		
5	15.a.	Derive Euler formula.	K4	CO5
	(OR)			
	15.b.	A sinusoidal voltage $E \sin \omega t$, where t is time, is passed through a half-wave rectifier that clips the negative portion of the wave,  Solve the Fourier series of the resulting periodic function $u(t) = \begin{cases} 0 & \text{if } -L < t < 0 \\ E \sin \omega t & \text{if } 0 < t < L \end{cases}$ $p = 2L = \frac{2\pi}{\omega}$, $L = \frac{\pi}{\omega}$		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Describe common functions in calculus.	K4	CO1
2	17	State and prove the Ratio test.	K4	CO2
3	18	Your company manufactures stainless steel right circular cylindrical molasses tanks that are 25 ft high with a radius of 5 ft. How sensitive are the tanks' volumes to small variations in height and radius?	K4	CO3
4	19	Solve $2xyy' = y^2 - x^2$.	K4	CO4
5	20	Find the two half-range expansions of the function $f(x) = \begin{cases} \frac{2k}{L} x & \text{if } 0 < x < \frac{L}{2} \\ \frac{2k}{L} (L - x) & \text{if } \frac{L}{2} < x < L \end{cases}$ 	K4	CO5

Z-Z-Z END

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)**

Branch- SOFTWARE SYSTEMS (Five Years Integrated)

PROBLEM SOLVING AND C PROGRAMMING

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What does the flowchart symbol 'diamond' represent? A) Start/End B) Input/Output C) Process D) Decision	K1	CO1
	2	In C language, which data type is used to store a single character? A) int B) float C) char D) double	K2	CO2
2	3	In a 'for' loop, which part is executed only once? A) The condition B) The initialization C) The increment D) The loop body	K1	CO1
	4	What is the purpose of a function prototype in C? A) To define the function B) To declare a function before it is defined C) To call a function D) To return a value from a function	K2	CO2
3	5	The correct way to declare an array in C is _____. A) int array[5]; B) array[5] int; C) array int[5]; D) int array();	K1	CO1
	6	In C, how do you declare a pointer to an integer? A) int* ptr; B) ptr int; C) int ptr*; D) pointer int;	K2.	CO2
4	7	Which of the following correctly defines a structure in C? A) struct MyStruct { int a; float b; }; B) structure MyStruct { int a; float b; }; C) struct MyStruct int a; float b; D) struct MyStruct() { int a; float b; };	K1.	CO1
	8	Which of the following statements is true regarding unions? A) Unions can store multiple values of different types at the same time B) Unions can only store one value at a time C) Unions use more memory than structures D) Unions must have at least two members	K2	CO2
5	9	Which preprocessor directive is used to include header files in C? A) #define B) #include C) #include_file D) #header	K1	CO1
	10	Which of the following is a valid way to define a macro in C? A) #define MAX 100' B) #define (MAX = 100) C) define MAX 100' D) #macro MAX 100	K2	CO2

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the concept of a flowchart and its importance in program development.	K2	CO2
		(OR)		
	11.b.	What are the basic data types in C? Provide examples for each.		
2	12.a.	Describe the function and syntax of the 'switch' statement. Provide an example.	K3	CO3
		(OR)		
	12.b.	What is a 'do-while' loop, and how does it differ from a 'while' loop?		
3	13.a.	Explain the process of initializing an array in C with an example.	K4	CO4
		(OR)		
	13.b.	What is a multidimensional array in C? How do you declare and initialize a 2D array?		
4	14.a.	Explain how to access structure members in C. Illustrate with an example.	K5	CO5
		(OR)		
	14.b.	Explain the difference between structures and unions in C.		
5	15.a.	Explain the different types of files in C and their characteristics.	K4	CO4
		(OR)		
	15.b.	What are command line arguments in C? How can you access them in a program?		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Describe the steps involved in problem-solving and program development. Illustrate each step with a brief example.	K3	CO3
2	17	Discuss the function call stack and activation records in C programming. How do they manage function calls?	K4	CO4
3	18	Explain the concept of column-major order in multidimensional arrays. How does it differ from row-major order?	K4	CO4
4	19	Explain bit fields in structures and their applications. Provide an example to illustrate.	K5	CO5
5	20	Illustrate how to handle binary files in C, including opening, reading, writing, and closing a binary file with examples.	K6	CO6

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch- SOFTWARE SYSTEMS(Five Years Integrated)

COMPUTER ORGANIZATION AND ARCHITECTURE

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

$$(10 \times 1 = 10)$$

Question No.	Question	K Level	CO
1	Choose the decimal equivalent of octal number 736.4 a) 478.5 b) 472.5 c) 478.25 d) 472.25	K1	CO1
2	_____ constitute the representation of the floating number. a) Sign b) Significant digits c) Scale factor d) All of the mentioned	K1	CO1
3	What will be the output from a D flip – flop if the clock is low and D = 0? a) 0 b) 1 c) No change d) Toggle between 0 and 1	K1	CO1
4	The main objective in building the multi-microprocessor is a) greater throughput b) enhanced fault tolerance c) greater throughput and enhanced fault tolerance d) none of the mentioned	K1	CO1
5	Which of the following is not a bitwise operator? a) b) ^ c) . d) <<	K1	CO1
6	The instruction format ‘register to register’ has a length of a) 2 bytes b) 1 byte c) 3 bytes d) 4 bytes	K1	CO1
7	What is the purpose of the CPU's control bus? a) To transport data within the CPU b) To control the flow of data between the CPU and other components c) To store data permanently d) To connect to the internet	K1	CO1
8	The correspondence between the main memory blocks and those in the cache is given by _____ a) Hash function b) Mapping function c) Locale function d) Assign function	K1	CO1
9	The DMA controller has access to how many channels at a time? a) 1 b) 2 c) 3 d) 4	K1	CO1
10	A peripheral is a) any drives installed in the computer b) tapedrive connected to a computer c) any physical device connected to the computer d) None of above	K1	CO1

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	Explain the types of complements in number system.	K2	CO2
	(OR)		
11.b.	Explain addition and subtraction operations on signed numbers.		
12.a.	Simplify the following boolean function- $F(A, B, C, D) = \sum m(0, 2, 8, 10, 14) + \sum d(5, 15)$	K4	CO4
	(OR)		
12.b.	List the four basic types of shift registers and explain.		
13.a.	Explain all the arithmetic micro operations.	K2	CO2
	(OR)		
13.b.	Explain interrupts in detail.		
14.a.	Explain evaluation of expressions using stack.	K5	CO5
	(OR)		
14.b.	Explain shift instructions with an example.		
15.a.	Compare isolated versus memory mapped I/O.	K4	CO4
	(OR)		
15.b.	List the characteristics of multiprocessors.		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

Question No.	Question	K Level	CO
16	Explain floating point representation in detail.	K5	CO5
17	Discuss about different logic gates with their truth tables and diagram.	K6	CO6
18	Explain the basic computer instructions.	K2	CO2
19	Demonstrate associative memory in detail.	K2	CO2
20	Discuss in detail on DMA.	K6	CO6

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Second Semester)

Branch - SOFTWARE SYSTEMS (Five Years Integrated)

OBJECT ORIENTED PROGRAMMING WITH C++

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which feature of OOP indicates code reusability? a) Abstraction b) Polymorphism c) Encapsulation d) Inheritance	K1	CO1
	2	Which header file is required in C++ to use OOP? a) OOP can be used without using any header file b) stdlib.h c) iostream.h d) stdio.h	K2	CO1
2	3	When we define the default values for a function? a) When a function is defined b) When a function is declared c) When the scope of the function is over d) When a function is called	K1	CO2
	4	Which of the following feature is used in function overloading and function with default argument? a) Encapsulation b) Polymorphism c) Abstraction d) Modularity	K2	CO2
3	5	What is the role of a constructor in classes? a) To modify the data whenever required b) To destroy an object c) To initialize the data members of an object when it is created d) To call private functions from the outer world	K1	CO3
	6	How many types of constructors are there in C++? a) 1 b) 2 c) 3 d) 4	K2	CO3
4	7	Which specifier makes all the data members and functions of base class inaccessible by the derived class? a) private b) protected c) public d) both private and protected	K1	CO4
	8	Which is the correct syntax of declaring a virtual function? a) virtual int func(); b) virtual int func(){}; c) inline virtual func(); d) inline virtual func(){};	K2	CO4
5	9	How Exception handling is implemented in the C++ program? a) Using Exception keyword b) Using try-catch block c) Using Exception block d) Using Error handling schedules	K1	CO5
	10	Which part of the try-catch block is always fully executed? a) try part b) catch part c) finally part d) throw part	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Illustrate basic concepts and benefits of OOP.	K4	CO1
	(OR)			
	11.b.	Examine application of OOP.		
2	12.a.	Define function prototyping. Explain with proper example.	K5	CO2
	(OR)			
	12.b.	Define inline function. Explain with suitable example.		
3	13.a.	Illustrate constructor with default arguments.	K4	CO3
	(OR)			
	13.b.	Elaborate dynamic initialization of objects.		
4	14.a.	Develop a C++ program to generate electricity bill using multiple inheritance.	K5	CO4
	(OR)			
	14.b.	Evaluate hybrid inheritance with suitable example.		
5	15.a.	Discuss about dynamic binding with example.	K4	CO5
	(OR)			
	15.b.	Enumerate generic functions and generic classes.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain brief history about structure of C++. What are the advantages of C++?	K4	CO1
2	17	Examine static data members and static member function with suitable example.	K5	CO2
3	18	Elucidate overloading unary and binary operator with example.	K4	CO3
4	19	Explain what is the use of inheritance? Give brief notes about multilevel inheritance with example.	K5	CO4
5	20	What is stream class? Determine string I/O and character I/O.	K4	CO5

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Second Semester)

Branch - SOFTWARE SYSTEMS (Five Years Integrated)

DATA STRUCTURES AND ALGORITHMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	A _____ is a set of domains. a) Profile b) Algorithm c) Code d) Data Structure	K1	CO2
	2	The data structure which reflects relationship among elements is called a rooted tree graph or simply a _____. a) graph b) list c) tree d) stack	K2	CO1
2	3	_____ is combining the records in two different sorted files in to a single sorted file. a) Sorting b) Searching c) Listing d) Merging	K1	CO3
	4	Arranging records in some logical order is called _____. a) Sorting b) Merging c) Searching d) Listing	K2	CO3
3	5	Deletion in queue take place at one end called _____. a) start b) front c) rear d) mid	K1	CO4
	6	Which of the following data structure is linear data structure? a) Tree b) Graph c) Array d) Linked list	K2	CO4
4	7	A binary tree whose every node has either zero or two children is called _____. a) complete binary tree b) binary search tree. c) extended binary tree. d) binary tree	K1	CO5
	8	A _____ is a collection of elements such that each element has been assigned a priority. a) priority queue b) array c) stack d) queue	K2	CO5
5	9	A _____ tree of a graph is an undirected tree consisting of only those edges. a) dense b) binary c) spanning d) parse	K1	CO3
	10	A tree is a finite set of _____. a) loops b) domains c) functions d) nodes	K2	CO3

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Analyze the implementation of multidimensional arrays.	K4	CO1
	(OR)			
	11.b.	Determine the algorithm in an application program differs from an algorithm in an abstract data type.		
2	12.a.	Explain the basic concept of recursion with example.	K5	CO2
	(OR)			
	12.b.	Illustrate the algorithm for linear queue.		
3	13.a.	Show the various operations performed on a queue.	K6	CO3
	(OR)			
	13.b.	Evaluate the algorithm for preorder traversal of a binary tree.		
4	14.a.	Examine the representations using adjacency matrix.	K5	CO4
	(OR)			
	14.b.	Assume the breadth-first traversal of a graph.		
5	15.a.	Demonstrate the algorithm for Radix sort with suitable example.	K6	CO5
	(OR)			
	15.b.	Infer the algorithm for Selection sort.		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Compare and construct best, worst and average case time complexities.	K6	CO1
2	17	Elucidate the implementation of circular queue with example.	K6	CO2
3	18	Assess the algorithm to insert a node into a doubly linked list.	K5	CO4
4	19	Develop an algorithm to delete a particular node from binary search tree.	K4	CO4
5	20	Sort the following list using Heap Sort technique, displaying each step. 20, 12, 25 6, 10, 15, 13.	K6	CO5

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch - **SOFTWARE SYSTEMS (Five Years Integrated)**

PROGRAMMING IN JAVA

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	The primary motivation of Java Creation is a) Internet b) Architecture neutral c) Web development d) Mobile development	K1	CO1
	2	The automatic initialization of objects is performed through a) Constructor b) Abstract classes c) Destructor d) this keyword	K2	CO1
2	3	Select the modifier in which members of a class cannot be accessed outside of a class is a) Public b) default c) protected d) private	K1	CO2
	4	To guard against and handle a run-time error, the code that you want to monitor inside a a) try block b) catch block c) throw block d) finally block	K2	CO3
3	5	The interprocess synchronization is achieved by a) message passing b) monitor c) control program d) compiler	K1	CO2
	6	The easiest way of creating thread is that implements through a) runnable interface b) extends synchronization c) deadlock method d) interthread mechanism	K2	CO3
4	7	An abstraction that either produces or consumes information is known as a) Reader b) Writer c) Stream d) I/O buffer	K1	CO2
	8	A small application program that are accessed by Internet server is Called _____. a) Session b) Cookies c) Packets d) Applet	K2	CO2
5	9	Which one provides a way to communicate the type of a collection to the compiler (type safety)? a) Generals b) Generics c) Annotations d) Virtual machine	K1	CO3
	10	The interface extends Collection and declares the behavior of a collection that stores a sequence of elements is called _____. a) Stack b) Queue c) List d) Array	K2	CO3

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Differentiate the use of break and continue statements.	K2	CO2
		(OR)		
	11.b.	Specify the functionality of Virtual function.		
2	12.a.	Inspect how the packages are imported?	K3	CO4
		(OR)		
	12.b.	Evaluate multiple catch clauses in exception handling.		
3	13.a.	Outline the importance of main thread in java.	K3	CO4
		(OR)		
	13.b.	Demonstrate isAlive() method in Thread.		
4	14.a.	Differentiate Byte streams and Character streams in I/O.	K4	CO5
		(OR)		
	14.b.	Describe some useful Swing GUI components.		
5	15.a.	Enumerate the enhanced for loop in J2SE	K4	CO4
		(OR)		
	15.b.	Summarize the overview of Collection Interface.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Construct a program to implement the method overloading technique.	K3	CO3
2	17	Analyze nested try statements in exception handling.	K3	CO4
3	18	Inspect interthread communication with an example.	K4	CO5
4	19	Develop a suitable code for reading a string in Java.	K6	CO5
5	20	Examine the difference between set interface and list interface.	K5	CO5

Z-Z-Z

END

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Third Semester)**

Branch - SOFTWARE SYSTEMS(Five Years Integrated)

DATABASE MANAGEMENT SYSTEM CONCEPTS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry EQUAL marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	The database definition or descriptive information is a) Beta – data b) Meta – data c) Alpha – data d) Data– description	K1	CO1
	2	The data in the database at a particular moment in time is called a) Instances b)Events c) Schemas d) Moments	K2	CO2
2	3	If every record in the file has exactly the same size (in bytes), the file is a) Same-size records b) Equal records c) fixed-length records d) constant size records	K1	CO2
	4	A candidate key that is chosen by the database designer as the principal means of identifying tuples uniquely is called a) Primary key b) Foreign key c) Reference key d) Super key	K2	CO1
3	5	The main SQL command for data definition is the a) SELECT statement b) DROP statement c) ALTER statement d) CREATE statement	K1	CO1
	6	Any such relation that is not part of the logical model, but is made visible to a user as a virtual relation, is called a) Procedure b) view c) Function d) Transaction	K2	CO2
4	7	Which one allows us to express constraints that uniquely identify the values of certain attributes? a) Normal forms b) Views c) Functional dependencies d) Super key	K1	CO2
	8	Which normal form allowing certain nontrivial functional dependencies whose left side is not a superkey? a) First b) Third c)Fourth d) Fifth	K2	CO2
5	9	Select the property of all actions of a transaction be executed completely, or, in case of some failure, partial effects of each incomplete transaction be undone. a) Durability b) Serializability c) Atomicity d) Isolation	K1	CO1
	10	To reduce the overhead of time consuming process of search and recovery we use a) Lock technique b) Checkpoints c) Test methods d) Validate techniques	K2	CO2

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Specify the purpose of database system.	K4	CO4
	(OR)			
	11.b.	Categorize the different types data models.		
2	12.a.	Inspect the access method of sequential files.	K3	CO4
	(OR)			
	12.b.	Present the basics of network model and hierarchical data model.		
3	13.a.	Demonstrate how the SQL commands used to define the databases.	K4	CO4
	(OR)			
	13.b.	Illustrate the creation of Functions in SQL.		
4	14.a.	Narrate the normal forms based on primary key.	K5	CO4
	(OR)			
	14.b.	Verify the fourth normal form in database design.		
5	15.a.	Demonstrate a simple transaction model with ACID properties.	K4	CO4
	(OR)			
	15.b.	Classify various failures that occur in system.		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Appraise the characteristics of database approach over file processing approach.	K4	CO5
2	17	Summarize the various operations performed on Files.	K3	CO4
3	18	Analyze the creation and usage of Views in SQL.	K5	CO5
4	19	Illustrate the Boyce-Codd normal form with example.	K6	CO5
5	20	Enumerate two phases after the recovery of system crash in detail.	K5	CO4

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

TRANSFORMATION TECHNIQUES

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	$L[\sin bt] = \underline{\hspace{2cm}}$ a) $\frac{b}{s^2+b^2}$ b) $\frac{b}{s^2-b^2}$ c) $\frac{s}{s^2+b^2}$ d) $\frac{s}{s^2-b^2}$	K1	CO1
	2	$L[3 + 2t] = \underline{\hspace{2cm}}$ a) $\frac{3}{s} + \frac{2}{s^2}$ b) $\frac{3}{s} - \frac{2}{s^2}$ c) $\frac{2}{s} + \frac{3}{s}$ d) $\frac{1}{s} + \frac{2}{s}$	K2	CO1
2	3	$L^{-1}[\frac{16}{s^3}] = \underline{\hspace{2cm}}$ a) $16t^2$ b) $4t^2$ c) $8t^2$ d) $2t^2$	K1	CO2
	4	Find the convolution of $2t$ and t^3 . a) $\frac{t^5}{10}$ b) $\frac{t^3}{10}$ c) $\frac{t^2}{10}$ d) $\frac{t^6}{10}$	K2	CO2
3	5	Z transform is defined by ____ a) $\sum_{k=0}^{\infty} f[k]z^{-k}$ b) $\sum_{k=0}^{\infty} f[k]z^k$ c) $\sum_{k=1}^{\infty} f[k]z^{-k}$ d) $\sum_{k=1}^{\infty} f[k]z^k$	K1	CO3
	6	The z transform of $e^{-k} + k$ is ____ a) $\frac{z}{z-e^{-1}} + \frac{z}{(z-1)^2}$ b) $\frac{z}{z-e} + \frac{z}{z-1}$ c) $\frac{z}{z-e} + \frac{1}{(z-1)^2}$ d) $\frac{z}{z-e^{-1}} + \frac{1}{(z-1)^2}$	K2	CO3
4	7	If $F(\omega)$ is the Fourier transform of $f(t)$ then ____ a) $\mathcal{F}\{f(t-\alpha)\} = e^{-j\alpha\omega}$ b) $\mathcal{F}\{f(t-\alpha)\} = e^{-j\alpha\omega}F(\omega)$ c) $\mathcal{F}\{f(t+\alpha)\} = e^{-j\alpha\omega}$ d) $\mathcal{F}\{f(t+\alpha)\} = e^{-j\alpha\omega}F(\omega)$	K1	CO4
	8	The correlation of $f(t)$ and $g(t)$ is ____ a) $f * g = \int_0^{\infty} f(\lambda)g(\lambda-t)d\lambda$ b) $f * g = \int_0^{\infty} f(\lambda)g(\lambda+t)d\lambda$ c) $f * g = \int_{-\infty}^{\infty} f(\lambda)g(\lambda-t)d\lambda$ d) $f * g = \int_{-\infty}^{\infty} f(\lambda)g(\lambda+t)d\lambda$	K2	CO4
5	9	When a sequence is cross-correlated with itself the process is known as ____ a) graphical method b) autocorrelation c) outer circle d) none	K1	CO5
	10	Convolution can be used on an audio signal to simulate the echoing or ____ of a real room or space. a) deconvolution b) linear convolution c) discrete convolution d) reverberation	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	i) State final value theorem. ii) Verify the final value theorem for $f(t) = e^{-2t}$	K2	CO1
		(OR)		
	11.b.	Find the Laplace transforms of (i) 1 (ii) e^{-at}		
2	12.a.	Find the inverse Laplace transforms of the following functions: (i) $\frac{s+3}{s^2+6s+13}$ (ii) $\frac{2s+3}{s^2+6s+13}$	K3	CO2
		(OR)		
	12.b.	Show that $f * g = g * f$ where $f(t) = 2t$ and $g(t) = t^3$.		
3	13.a.	Find the z transform of the sequence defined by $f[k] = k, k \in \mathbb{N}$.	K3	CO3
		(OR)		
	13.b.	Use the binomial theorem to expand $\left(1 - \frac{1}{z}\right)^{-3}$ up to the term $\frac{1}{z^4}$. Hence find the sequence with z transform $F(z) = \frac{z^3}{(z-1)^3}$.		
4	14.a.	Find $\mathcal{F}\{u(t)e^{-t} + u(t)e^{-2t}\}$.	K4	CO4
		(OR)		
	14.b.	Find the Fourier transform of $f(t) = \begin{cases} e^{-3t} & t \geq 0 \\ e^{3t} & t < 0 \end{cases}$ Deduce the function whose Fourier transform is $G(\omega) = \frac{6}{10+2\omega+\omega^2}$.		
5	15.a.	Show that the function $\tilde{F}(\omega) = T \sum_{n=0}^{N-1} f[n]e^{-j\omega nT}$ is periodic with period $\frac{2\pi}{T}$.	K4	CO5
		(OR)		
	15.b.	i) Find the circular autocorrelation of the sequence $f[n] = 3, 2, 1$ using the formula. ii) Develop a graphical method for performing this calculation.		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	The Laplace transform of a function is $\frac{e^{-3s}}{s^2}$. Find the function.	K4	CO1
2	17	Solve $y'' - y = -t^2$ $y(0) = 2, y'(0) = 0$ using the Laplace transform.	K4	CO2
3	18	The continuous signal $f(t) = \cos\left(\frac{\pi t}{2}\right)$ is sampled at 1 second intervals starting from $t = 0$. i) Find the Laplace transform of the sampled signal $f^*(t)$. ii) Show that $F^*(s)$ has an infinity of poles. iii) Find the z transform of the sampled signal and show that this has just two poles.	K4	CO3
4	19	i) Using the definition of correlation, calculate the correlation of $f(t) = u(t)e^{-t}$ and $g(t) = u(t)e^{-2t}$, where $u(t)$ is the unit step function. ii) Verify the correlation theorem for these functions.	K4	CO4
5	20	Find the d.f.t. of the sequence $f[n] = 1, 2, -5, 3$.	K4	CO5

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2024
(Fourth Semester)

Branch – SOFTWARE SYSTEMS(Five year Integrated)

COMPUTER NETWORKS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The OSI Reference Model consists of how many layers?
(i) 5 (ii) 7 (iii) 9 (iv) 11
- 2 Packet switching is most commonly used in
(i) Telecommunication networks (ii) Computer networks
(iii) Traditional telephony (iv) Analog TV
- 3 Which error detection method uses a polynomial division technique?
(i) Parity check (ii) Checksum
(iii) Hamming Code (iv) Cyclic Redundancy Check (CRC)
- 4 What is the purpose of the sliding window protocol?
(i) Flow control (ii) Error detection
(iii) Congestion control (iv) Addressing
- 5 What does TCP stand for?
(i) Transmission Control Protocol
(ii) Transport Communication Protocol
(iii) Transfer Control Process
(iv) Transmission Communication Process

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a) Explain about the key goals of a computer network.
OR
b) Classify between analog and digital data transmission.
- 7 a) Discuss about multiplexing, and how is it used in networks?
OR
b) Show the difference between TDM and FDM.
- 8 a) How does transmission impairment affect the quality of digital communication?
OR
b) Discuss about Hamming Code, and how does it detect and correct errors?

Cont...

- 9 a) Evaluate the function of CSMA/CD in Ethernet networks.
OR
b) How does Distance Vector Routing work?
- 10 a) Discuss about the three-way handshake in TCP, and why is it used?
OR
b) Explain the role of the 'window size' in TCP

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a) Analyze how data encoding techniques work in digital communication.
OR
b) Justify how bandwidth affects network performance?
- 12 a) Formulate about the working principles of multiplexing techniques in data communication.
OR
b) Differentiate about the advantages and limitations of synchronous vs. asynchronous communication?
- 13 a) Explain different types of transmission impairments and their impact on data communication.
OR
b) Compare the concept of error detection and correction improve the reliability of data transmission?
- 14 a) Describe the Stop-and-Wait ARQ and Go-Back-N ARQ protocols and compare their efficiencies.
OR
b) State about subnetting and why it is used?
- 15 a) Explain the process of TCP connection establishment and termination.
OR
b) Design the structure of TCP headers, highlighting important fields.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Fourth Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

8051 MICROCONTROLLER AND ITS APPLICATIONS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 When 8051 wakes up then 0x00 is loaded to which register?
(i) PSW (ii) SP
(iii) PC (iv) DPTR
- 2 When the microcontroller executes some arithmetic operations, then the flags bits of which register are affected?
(i) PSW (ii) SP
(iii) DPTR (iv) PC
- 3 What is the bit transmitting and receiving capability of mode 1 in serial communication?
(i) 8 bits (ii) 10 bits
(iii) 11 bits (iv) 12 bits
- 4 8051 has ____ special function registers
(i) 21 (ii) 8
(iii) 16 (iv) 11
- 5 Which of the following motor rotates in discrete angular steps?
(i) Servo motor (ii) DC Motor
(iii) Stepper motor (iv) LM

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Discuss about the Rom in 8051.
OR
b Explain briefly about the Flag bits in 8051.
- 7 a Illustrate the logical instructions with examples.
OR
b Justify the Call instructions with examples.
- 8 a Evaluate the Timer 1 operations in 8051.
OR
b Explain about the functions of Counters in 8051.
- 9 a Explain and write the subtraction of two 8 bit numbers.
OR
b Explain to find the two's complement of 8 bit numbers.
- 10 a Discuss the interfacing ADC to the 8051.
OR
b Justify the interfacing LED to the 8051.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11 a Enumerate the microcontrollers for embedded systems.

OR

b Elucidate the PSW register in 8051.

12 a Explain the Data transfer instructions with examples.

OR

b Determine the Register Specific indexed addressing mode in 8051.

13 a Evaluate the various Timers in 8051.

OR

b Compare the timers and counters in 8051 microcontroller.

14 a Develop and to write the Multiplication of 8 bit numbers.

OR

b Determine to find largest numbers in an array.

15 a Elucidate the interfacing Temperature sensors to 8051.

OR

b Enumerate the interfacing Stepper motor in 8051.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch – SOFTWARE SYSTEMS (Five year Integrated)

APPLIED PHYSICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 Spontaneous emission refers to
 - (i) Emission due to external stimulation
 - (ii) Emission without external stimulation
 - (iii) Absorption of light
 - (iv) Emission at higher frequencies
- 2 The principle of a YAG laser is based on
 - (i) Ruby crystal
 - (ii) Fiber optics
 - (iii) Neodymium-doped Yttrium Aluminum Garnet
 - (iv) CO₂ gas
- 3 Band theory of solids helps in understanding
 - (i) Magnetic properties of metals
 - (ii) Conductivity of solids
 - (iii) Nuclear structure
 - (iv) Light emission from materials
- 4 Resistivity is defined as
 - (i) The opposition to the flow of electric current
 - (ii) The ability of a material to conduct heat
 - (iii) The voltage across a conductor
 - (iv) The energy lost in a material
- 5 An extrinsic semiconductor is
 - (i) Pure with no impurities
 - (ii) Impure with added dopants
 - (iii) Always a metal
 - (iv) A material with high conductivity
- 6 The Hall effect is used to
 - (i) Measure voltage
 - (ii) Determine the magnetic field strength
 - (iii) Calculate temperature
 - (iv) Determine the type of charge carriers
- 7 Ferromagnetic materials are characterized by
 - (i) Weak interaction with magnetic fields
 - (ii) Strong magnetic ordering
 - (iii) No magnetic properties
 - (iv) No magnetic properties
- 8 Hysteresis refers to
 - (i) Energy loss due to lag in magnetization
 - (ii) Magnetic flux variation
 - (iii) Electrical conductivity increase
 - (iv) Thermal expansion of metals
- 9 Shape memory alloys (SMA) are known for
 - (i) Superconductivity
 - (ii) Returning to their original shape after deformation
 - (iii) Absorbing heat energy
 - (iv) Being brittle under stress
- 10 Superconductivity is a property where materials
 - (i) Conduct heat efficiently
 - (ii) Absorb magnetic fields
 - (iii) Show zero electrical resistance
 - (iv) Emit light when cooled

Cont...

SECTION - B (35 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

(5 x 7 = 35)

- 11 a Explain the classification of lasers based on materials and explain their application.
OR
b Discuss the different modes of propagation in fiber optics.
- 12 a Explain the factors affecting the resistivity of metals.
OR
b Discuss the applications of conducting materials and resistance thermometers.
- 13 a Explain the working of a solar cell and its applications.
OR
b Discuss the different types of semiconductor memory devices.
- 14 a Explain the domain theory of ferromagnetism.
OR
b Discuss the properties and applications of hard and soft magnetic materials.
- 15 a Explain the properties and applications of shape memory alloys.
OR
b Discuss the synthesis methods and applications of nano materials.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks

(3 x 10 = 30)

- 16 Describe the working mechanism and applications of a CO₂ laser in detail.
- 17 Describe the Drude-Lorentz theory of electrical conduction and its applications.
- 18 Describe the intrinsic and extrinsic semiconductors, highlighting their properties and applications.
- 19 Describe the structure and applications of optical, magnetic, and magneto-optical memory devices.
- 20 Describe the types and applications of superconductors, including SQUID, levitation, and cryotron.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Fourth Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

WEB APPLICATION DEVELOPMENT

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. The HTTP request message is sent in _____ part of three-way handshake.
a) First
b) Second
c) Third
d) Fourth
2. Which of the following tag is used to embed CSS in HTML page?
a) <css>
b) <!DOCTYPE html>
c) <script>
d) <style>
3. JavaScript is an _____ language.
a) Procedural b) Object oriented c) Object based d) High level
4. _____ function is used to save a cookie in the user's computer.
a) savecookie() b) createcookie() c) create_cookie() d) setcookie()
5. Ajax stands for _____.
a) Asynchronous JavaScript and XML
b) Asynchronous JSON and XML
c) Asynchronous Java and XML
d) Asynchronous JavaScript and XMLHttpRequest

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a. Illustrate the WWW.
OR
b. Discuss the Web Server Architecture.
7. a. Explain the Basic Structure of HTML.
OR
b. Illustrate the Positioning using CSS.
8. a. Determine the types of Operators in JavaScript.
OR
b. Explain the Do---WHILE Statement in JavaScript.

Cont...

9. a. Explain the Variables and Constants in PHP.
OR
b. Discuss the foreach loop Statement with example.
- 10 a. Illustrate the Server FTP Upload in PHP.
OR
b. Compare the Host and Domain Registration..

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

11. a. Construct the Business Logic Layer.
OR
b. Design the HTTP Architecture and Methods.
12. a. What is form? Give the detail about HTML form elements.
OR
b. Construct the types of style sheets linking to HTML document.
13. a. Enumerate the Conditional Statements in JavaScript.
OR
b. Elucidate the working with functions in JavaScript.
14. a. Interpret the Arrays and its types in PHP.
OR
b. Compare the Cookies and Sessions with example.
15. a. Construct the AJAX in PHP.
OR
b. How to access MYSQL database in PHP? Briefly explain.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Fourth Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

APPLIED LINEAR ALGEBRA

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. If two linear equations are given as $2x+3y=5$ and $4x+6y=10$, what is the nature of their solution?
(i) No solution (ii) Unique solution
(iii) Infinitely many solutions (iv) None of the above
2. If a set of vectors is linearly independent, this means:
(i) No vector in the set can be written as a linear combination of the others
(ii) Every vector in the set can be written as a linear combination of the others
(iii) The vectors span the entire vector space
(iv) The set contains the zero vector
3. In an inner product space, two vectors u and v are orthonormal if:
(i) They are orthogonal, and their norms are 1.
(ii) They are parallel, and their norms are 1.
(iv) Their inner product is greater than 1.
(iv) Their norms are both equal to 0.
4. What is the kernel of a linear transformation?
(i) The set of vectors that the transformation maps to the zero vector
(ii) The set of vectors that the transformation maps to the identity vector.
(iii) The set of vectors that are scaled by the transformation
(iv) The set of all possible images of the transformation.
5. Which of the following statements is true about eigenvalues of a matrix?
(i) Eigenvalues are always positive
(ii) Eigenvalues can be real or complex numbers
(iii) Eigenvalues must always be distinct
(iv) Eigenvalues are always integers.

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Given $u = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ and $v = \begin{bmatrix} 2 \\ -5 \end{bmatrix}$, find $4u$, $(-3)v$ and $4u + (-3)v$.
OR
b When we say the rectangular matrix is in echelon form?
- 7 a Define vector space and give one example.
OR
b Use the Wronskian to show that $f_1 = 1$, $f_2 = e^x$ and $f_3 = e^{2x}$ are linearly independent.
- 8 a State and prove Cauchy-Schwarz inequality.
OR
b State and prove projection theorem.
- 9 a If $T: V \rightarrow W$ is a linear transformation, then prove the following:
i) $T(0) = 0$
ii) $T(u - v) = T(u) - T(v)$ for all u and v in V .
OR

Cont...

Q.no.9 Cont...

- 9 b Let $T: P_1 \rightarrow P_2$ be the linear transformation defined by $T(p(x)) = xp(x)$ Find the matrix for T with respect to the standard bases $B = \{u_1, u_2\}$, and $B' = \{v_1, v_2, v_3\}$ where $u_1 = 1, u_2 = x; v_1 = 1, v_2 = x, v_3 = x^2$.
- 10 a Let $A = \begin{bmatrix} 1 & 6 \\ 5 & 2 \end{bmatrix}, u = \begin{bmatrix} 6 \\ -5 \end{bmatrix}$, and $v = \begin{bmatrix} 3 \\ -2 \end{bmatrix}$. Are u and v eigen vectors?
OR
- b If $v_1, v_2, \dots, v_r$ are eigen vectors that correspond to distinct eigen values $\mu_1, \mu_2, \dots, \mu_r$ of an $n \times n$ matrix A , then prove that the set $\{v_1, v_2, \dots, v_r\}$ is linearly independent.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a Determine if the following homogeneous system has a nontrivial solution, then find the solution set.
 $3x_1 + 5x_2 - 4x_3 = 0; -3x_1 - 2x_2 + 4x_3 = 0; 6x_1 + x_2 - 8x_3 = 0;$
OR
- b Solve the following system of equations if system is consistent.
 $x_2 - 4x_3 = 8; 2x_1 - 3x_2 + 2x_3 = 1; 5x_1 - 8x_2 + 7x_3 = 1;$
- 12 a Determine whether $v_1 = (1,1,2), v_2 = (1,0,1)$ and $v_3 = (2,1,3)$ span the vector space R^3

OR

- b Find the rank and nullity of the matrix $A = \begin{bmatrix} -1 & 2 & 0 & 4 & 5 & -3 \\ 3 & -7 & 2 & 0 & 1 & 4 \\ 2 & -5 & 2 & 4 & 6 & 1 \\ 4 & -9 & 2 & -4 & -4 & 7 \end{bmatrix}$

- 13 a i) Show that the vectors $w_1 = (0,2,0), w_2 = (3,0,3), w_3 = (-4,0,4)$ form an orthogonal basis for R^3 with the Euclidean inner product, and use that basis to find an orthonormal basis by normalizing each vector.
ii) Express the vector $u = (1,2,4)$ as a linear combination of the orthonormal basis vectors obtained in part (i).

OR

- b Find the QR-Decomposition of 3×3 matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$.

- 14 a Prove that every n -dimensional vector space is isomorphic to R^n .

OR

- b Let $T: P_2 \rightarrow P_2$ be the linear operator defined by $T(p(x)) = p(3x - 5)$ that is, $T(c_0 + c_1x + c_2x^2) = c_0 + c_1(3x - 5) + c_2(3x - 5)^2$
i) Find $[T]_B$ relative to the basis $B = \{1, x, x^2\}$.
ii) Use the indirect procedure to compute $T(1 + 2x + 3x^2)$
iii) Check the result in (ii) by computing $T(1 + 2x + 3x^2)$ directly.

- 15 a Define characteristic equation and Find the characteristic equation of

$$A = \begin{bmatrix} 5 & -2 & 6 & -1 \\ 0 & 3 & -8 & 0 \\ 0 & 0 & 5 & 4 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

OR

- b Diagonalize the matrix $A = \begin{bmatrix} 6 & -2 & -1 \\ -2 & 6 & -1 \\ -1 & -1 & 5 \end{bmatrix}$

1

Answer

Three

Merrill

SECT

A _____

ALL

45-1

1. Pick the wrong data mining functionality among the given data mining functionalities.
 - a) Classification
 - b) Clustering
 - c) Class Description
 - d) Object Description
2. OLAP stands for
 - a) Online analytical processing
 - b) Online analysis processing
 - c) Online transaction processing
 - d) Online aggregate processing
3. Clustering is used in _____ phase of data segregation.
 - a) Intermediate Phase
 - b) First Phase
 - c) Last Phase
 - d) Second Phase
4. Which of the following can also applied to other forms?
 - a) Data streams & Sequence data
 - b) Networked data
 - c) Text & Spatial data
 - d) All of these
5. In web mining, _____ is used to know the order in which URLs tend to be accessed.
 - a) Clustering
 - b) Associations
 - c) sequential analysis
 - d) classification

CECT

▲

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15 2

6. a. Explain the kinds of Data in Data Mining.
OR
b. Discuss the Data Cleaning and Smoothing.
7. a. What is the Need of Data warehouse? Explain.
OR
b. Illustrate the Multidimensional Data Model.
8. a. Determine the Ensemble Learning.
OR
b. Evaluate the Clustering.
9. a. Explain the Characteristics of Streaming Data.
OR
b. Discuss the Applications in Bioinformatics.
10. a. Illustrate the MVTs data in Data Mining.
OR
b. Evaluate the Spatial Data Mining.

2.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

11. a. Elucidate the Major Issues and Importance in Data Mining.

OR

b. Construct the Overview of Data Mining Techniques.

12. a. Design the Data Warehouse Architecture.

OR

b. Explain the types of Online Analytical Processing.

13. a. Enumerate the Mining Frequency Patterns.

OR

b. Elucidate the Overview of Classification Techniques.

14. a. Survey the Incremental Algorithm for Data Mining.

OR

b. Elucidate the Issues and Challenges in Data Mining.

15 a. Construct the Importance and Sources of MVTS data.

OR

b. Determine the Web and Text Mining.

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – SOFTWARE SYSTEMS (Five Year Integrated)

ARTIFICIAL INTELLIGENCE

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Who is known as the -Father of AI"?
(i) Fisher Ada (ii) Alan Turing
(iii) John McCarthy (iv) Allen Newell
2. The process of removing detail from a given state representation is called _____.
(i) Extraction (ii) Abstraction
(iii) Information Retrieval (iv) Mining of data
3. Which is not a property of representation of knowledge?
(i) Representational Verification (ii) Representational Adequacy
(iii) Inferential Adequacy (iv) Inferential Efficiency
4. A Hybrid Bayesian network contains _____.
(i) Discrete & continuous variables (ii) Only Discrete variables
(iii) Only Discontinuous variable (iv) Both Discrete & Discontinuous variable
5. Which agent deals with the happy and unhappy state?
(i) Learning Agent (ii) Model-based agent
(iii) Goal-based Agent (iv) Utility-based agent

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a. Write any three key components of AI.
OR
b. What are the different between Robotic and Software agent?
- 7 a. Explain the Heuristic Search.
OR
b. Discuss about Beta Pruning.
- 8 a. Illustrate the Propositional Logic.
OR
b. Prepare the note on Inference.
- 9 a. Write notes on probabilistic reasoning.
OR
b. Explain the concept of Dynamic Bayesian networks.
- 10 a. Discuss about Policy iteration.
OR
b. Prepare the short notes on Game theory.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a. Briefly explain about the Foundation of AI.
OR
b. Explain the concept of Agent based systems.
- 12 a. Elucidate the Problem solving agent.
OR
b. Explain in detailed about Genetic Algorithms.
- 13 a. Write in detailed notes on Knowledge based agent.
OR
b. Analyze the Hidden Markov Models.
- 14 a. Elucidate the concept on Semantic Bayesian Networks.
OR
b. Explain the concept of Inference in Temporal Models.
- 15 a. Analyze the concept of Sequential decision problems.
OR
b. Explain in detailed about Value & Policy iterations.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch –SOFTWARE SYSTEMS (Five Years Integrated)

SOFTWARE ENGINEERING AND TESTING

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

- 1 During the requirements modeling phase, what is created to visually represent system functions and data flow?
(i) Class diagrams (ii) Use case diagrams
(iii) Database schema (iv) Source code
- 2 Which of the following is an example of a specialized process model?
(i) Waterfall model (ii) Spiral model
(iii) Agile model (iv) V-model
- 3 Which of the following is a part of the strategic approach to software testing?
(i) Code writing (ii) Defining test cases early
(iii) Customer training (iv) Final product review
- 4 What is the primary focus of component-level testing?
(i) Testing individual software components
(ii) Testing integrated modules
(iii) System-wide testing
(iv) User interface testing
- 5 In UML modeling, which diagram best illustrates how objects interact to fulfill a use case?
(i) State diagram (ii) Class diagram
(iii) Collaboration diagram (iv) Component diagram

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a Explain about Negotiating and Validating Requirements.
OR
b Discuss about the Behavioral Model.
- 7 a Classify the Elements of Software Quality Assurance.
OR
b Analyze in detail about Deployment-Level design Elements.
- 8 a Explain White-Box Testing.
OR
b Organize the Software Testing Fundamentals.

Cont...

- 9 a Evaluate the Database Testing in detail.
OR
b Show about the Partition Testing at the class level.
- 10 a Sketch the Use Case diagram in UML with example.
OR
b Illustrate the Design Workflow in UML.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a Justify the Class-Responsibility-Collaborator (CRC) Modeling.
OR
b Construct the Flow-oriented Modeling.
- 12 a Summarize the various Design concepts.
OR
b Analyze about the Specialized Process Model.
- 13 a Enumerate the Control Structure testing.
OR
b Explain the System Testing.
- 14 a Criticize about the Object-oriented Testing Strategies.
OR
b Explain the Performance Testing.
- 15 a Classify the UML Component and Object Diagrams.
OR
b Predict and create the Requirements Workflow in UML.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

MAJOR ELECTIVE COURSE- I: DESIGN AND ANALYSIS OF ALGORITHMS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Which of the following best describes space complexity?
(i) The amount of time an algorithm takes to run
(ii) The amount of memory an algorithm requires to execute
(iii) The number of inputs an algorithm can handle
(iv) The number of times an algorithm loops
- 2 What is a splay operation?
(i) moving parent node to down of child (ii) moving a node to root
(iii) moving root to leaf (iv) removing leaf node
- 3 Which of the following algorithms is the best approach for solving Huffman codes?
(i) greedy algorithm (ii) exhaustive search
(iii) divide and conquer algorithm (iv) brute force algorithm
- 4 Which of the following is/are property/properties of a dynamic programming problem?
(i) Optimal substructure
(ii) Overlapping subproblems
(iii) Greedy approach
(iv) Both optimal substructure and overlapping subproblems
- 5 Identify, backtracking can be used to solve
(i) Numerical problems (ii) Exhaustive search
(iii) Combinatorial problems (iv) Graph coloring problems

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Explain different Characteristics of an Algorithm.
OR
b Explain how rotations work in AVL trees to maintain balance.
- 7 a Illustrate searching in splay trees.
OR
b State the properties of a multiway search tree.
- 8 a Explain an algorithm for Iterative binary search.
OR
b Explain the greedy method and how it works.

Cont...

- 9 a Show the general procedure for dynamic programming.
OR
b What is computational intractability, and how does it relate to NP-hard problems?
- 10 a Explain backtracking general method.
OR
b Discuss the 0/1 Knapsack problem.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Analyze the recursive algorithm with an example.
OR
b Explain AVL tree insertion.
- 12 a Analyze the amortized time complexity of splay trees, and how is it calculated?
OR
b Elucidate B tree insertion operation.
- 13 a Develop Quick Sort Algorithm and Explain it with example.
OR
b Develop Prim's algorithm to solve minimum cost spanning trees.
- 14 a Elucidate travelling salesman problem using dynamic programming.
OR
b Compare NP-hard and NP-complete problems.
- 15 a Elucidate N-Queens problem using backtracking.
OR
b Create 0/1 Knapsack problem using Branch and Bound method.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch – SOFTWARE SYSTEMS (Five years Integrated)

DISCIPLINE SPECIFIC ELECTIVE- IV : SOFTWARE METRICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 Software engineering focuses on implementing the software in a controlled and
(i) Scientific way (ii) Metrics
(iii) Measures (iv) Technology
- 2 There are on average --- faults in every -----lines of software code.
(i) 53 - 1001 (ii) 55- 1001
(iii) 55 - 1000 (iv) 53 -1000
- 3 What is the full form of the "COCOMO" model?
(i) Cost Constructive Estimation Model (ii) Constructive Cost Estimation Model
(iii) Constructive Case Estimation Model (iv) Constructive Cost Estimating Model
- 4 Size and Complexity are a part of
(i) Product Metrics (ii) Process Metrics
(iii) Project Metrics (iv) All of the mentioned
- 5 Attributes of good software is _____.
(i) Development (ii) Maintainability & functionality
(iii) Functionality (iv) Maintainability
- 6 Number of errors found per person hours expended is an example of a
(i) Measurement (ii) Measure
(iii) Metric (iv) All of the mentioned
- 7 Which of the following is an indirect measure of product?
(i) Quality (ii) Complexity
(iii) Reliability (iv) All of the Mentioned
- 8 In size-oriented metrics, metrics are developed based on the _____.
(i) Number of Functions (ii) Number of user inputs
(iii) Number of lines of code (iv) Amount of memory usage
- 9 How is reliability and failure intensity related to each other?
(i) Direct relation (ii) Inverse relation
(iii) No relation (iv) None of the mentioned
- 10 Statement and branch coverage metrics are part of
(i) Analysis Model (ii) Testing
(iii) Design Model (iv) Source Code

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a Classify the measurement in software engineering.
OR
b Discuss the software measurement validation.
- 12 a Explain the applications of size measures.
OR
b Evaluate the aspects of structural measures.
- 13 a Discuss the Littlewood–Verrall Model.
OR
b Determine the Jelinski–Moranda Model.
- 14 a Analyze the good estimate.
OR
b Interpret the importance of making process prediction in resource measurement.
- 15 a Justify the measurement program.
OR
b Explain the role of analysts.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

Question No. 16 is Compulsory

- 16 Analyze the scope of software metrics.
- 17 a Explain about modeling software quality.
OR
b Analyze the security measures.
- 18 a Justify the recalibration of software reliability growth predictions.
OR
b Evaluate the parametric reliability growth models.
- 19 a Explain how to deal with problems of current estimation methods.
OR
b Elaborate the models of effort and cost in resource management.
- 20 a Categorize the measurement tools.
OR
b Invent the measurement in practice.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch – SOFTWARE SYSTEMS (Five year Integrated)

PROGRAMMING IN C

Time: Three Hours

Maximum: 75 Marks

SECTION - A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 X 1 = 10)

1. Which is the pictorial representation for solving the problem?
a) Algorithm b) Flowchart c) Program d) Process
2. How much number of bytes does a float variable occupies in the memory?
a) 1 b) 2 c) 4 d) 8
3. Which statement is branching statement?
a) if b) for c) switch d) break
4. What is the return type of a function in default?
a) void b) int c) char d) float
5. What is a collection of related data of same data type?
a) structure b) array c) pointer d) functions
6. The name of an array, is actually a pointer to the _____ element of the array.
a) last b) first c) second d) random
7. Which operator is used to access the structure member using pointer?
a) * b) & c) -> d) ;
8. The highest memory location is shared by all the members in the group, the members are in the _____.
a) Array b) Structure c) function d) Union
9. The second argument in fopen() function is _____.
a) file name b) file mode c) file size d) file attribute
10. rewind() moves the file position to
a) beginning of the file b) move 4 bytes in forward
c) end of the file d) move 4 bytes in backward

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 X 5 = 25)

11. a) What is an Algorithm? Write the characteristics of an algorithm.
OR
b) Write a short note on programming languages.
12. a) Make use of if ..else and Nested if control structures in problem solving.
OR
b) Construct a C program to perform arithmetic operations.
13. a) Apply the declaration and initialization of one-dimensional array.
OR
b) Develop the functions by passing arguments as values and address.

Cont...

14. a) Write about pointer declaration in C with example.

OR

- b) Analyze the difference between structure and union.

15. a) Explain random access file operations.

OR

- b) List the preprocessor directives and explain with examples.

SECTION – C (40 Marks)

Answer ALL Questions

ALL questions carry EQUAL Marks

(5 x 8 = 40)

Question No. 16 is Compulsory

16. List and explain Arithmetic, Relational, Logical, Increment and Decrement Operators.

17. a) Illustrate switch control structures in C with proper example.

OR

- b) Explain looping statements in C.

18. a) Classify the functions in C based on return type and arguments.

OR

- b) Explain arrays in C with example.

19. a) How to access the array elements using pointers? Explain with example.

OR

- b) Develop a C program to print student mark statement using structures.

20. a) Explain sequential file operations in C programming.

OR

- b) Assess command line arguments in C.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch – SOFTWARE SYSTEMS(Five Years Integrated)

CALCULUS AND ITS APPLICATIONS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 Find $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$
(i) 0 (ii) 2 (iii) 4 (iv) 3
- 2 What is the value of definite integral $\int_0^2 (2x + 1) dx$
(i) 4 (ii) 5 (iii) 6 (iv) 7
- 3 Which of the following is the correct value of series : $\sum_{n=0}^{\infty} \frac{4}{2^n}$
(i) 2 (ii) 4 (iii) 8 (iv) diverges
- 4 Identify the series $\sum_{n=1}^{\infty} \frac{2^n}{n!}$ does this series converge?
(i) Yes, by the ratio test (ii) No, by the ratio test
(iii) Yes, by the root test (iv) No, by the root test
- 5 What is $\frac{dy}{dx}$ if $y = \cos(4x^2 + 3)$ using chain rule
(i) $-8x \sin(4x^2 + 3)$ (ii) $8x \sin(4x^2 + 3)$
(iii) $4x \sin(4x^2 + 3)$ (iv) $-4x \sin(4x^2 + 3)$
- 6 When the function $f(x, y) = x^3 + y^3 - 12x - 3y + 20$. Determine the nature of the critical point at (6, -1)
(i) local maximum (ii) local minimum
(iii) saddle point (iv) cannot be determined
- 7 Find the general solution of $xy' = 2y + x^3 e^x$
(i) $y = Ce^{2x} + \frac{x^3 e^x}{x^2}$ (ii) $y = Ce^{2x} + x^2 e^x - x^2$
(iii) $y = Ce^{2x} + x^3 e^x$ (iv) $y = Cx^2 + e^x$
- 8 Identify the given ODE $(D^5 + 2D^3 + D)y = 0$
(i) $y(x) = C_1 + C_2 e^x + C_3 e^x$ (ii) $y(x) = C_1 + C_2 \cos(x) + C_3 \sin(x)$
(iii) $y(x) = C_1 + C_2 x + C_3 x^2$ (iv) $y(x) = C_1 e^{ix} + C_2 e^{ix} + C_3$
- 9 Choose whether function $f(x) = x \cot(x)$ is an even function, odd function or neither
(i) Even function (ii) Odd function
(iii) Neither even nor odd (iv) Both even and odd
- 10 What is the fundamental period of the function $f(x) = \cos(x)$
(i) π (ii) 2π (iii) 4π (iv) $\frac{2\pi}{3}$

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a Evaluate if $f(x) = x + 5$ and $g(x) = x^2 - 3$, find the following
(i) $f(g(0))$ (ii) $f(f(x))$ (iii) $g(f(x))$
OR
- b Solve $\lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 100} - 10}{x^2}$
- 12 a State and prove the monotonic sequence theorem.
OR

Cont...

Q.no 12 Cont....

- b Define ratio test. Discuss the convergence of the series $\sum_{n=0}^{\infty} \frac{2^{n+5}}{3^n}$

- 13 a Analyze $\lim_{(x,y) \rightarrow (0,0)} \frac{4xy^2}{x^2+y^2}$ if it exists.

OR

- b Determine the linearization of $L(x, y, z)$ of $f(x, y, z) = x^2 - xy + 3\sin z$ at the point $(x_0, y_0, z_0) = (2, 1, 0)$. Find an upper bound for the error incurred in replacing f by L on the rectangular region
 $R: |x - 2| \leq 0.01, |y - 1| \leq 0.02, |z| \leq 0.01$.

- 14 a Evaluate an integrating factor and solve the initial value problem
 $(e^{x+y} + ye^y)dx + (xe^y - 1)dy = 0, y(0) = -1$

OR

- b Solve: $2xyy' = y^2 - x^2$

- 15 a Illustrate the Fourier series of the function

$$f(x) = \begin{cases} -k, & \text{if } -2 < x < 0 \\ k, & \text{if } 0 < x < 2 \end{cases} \quad p = 2L = 4, L = 2.$$

OR

- b Discuss: i) periodic function ii) Even function of period 2π

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

- 16 a Evaluate that $\lim_{x \rightarrow c} f(x) = L$ and $\lim_{x \rightarrow c} g(x) = M$, prove that

$$\lim_{x \rightarrow c} (f(x) + g(x)) = L + M$$

OR

- b Determine the limiting value of lower sum approximations to the area of the region R of $y = 1 - x^2$ and above the interval $[0, 1]$ on the x -axis using equal-width rectangles whose widths approaches zero and whose number approaches infinity.

- 17 a Justify the sequence whose n^{th} term is $a_n = \left(\frac{n+1}{n-1}\right)^n$ converge?
 If so, find $\lim_{n \rightarrow \infty} a_n$

OR

- b Enumerate that the Taylor series generated by $f(x) = e^x$ at $x = 0$ converges to $f(x)$ for every real value of x .

- 18 a (i) Solve the derivative of $f(x, y, z) = x^3 - xy^2 - z$ at $P_0(1, 1, 0)$ in the direction of
 $v = 2i - 3j + 6k$.

(ii) In what directions does f change most rapidly at P_0 and what are the rates of change in these directions?

OR

- b Evaluate the point $p(x, y, z)$ on the plane $2x + y - z - 5 = 0$ that is closest to the origin.

- 19 a Analyze that y is a solution of the ODE. Determine from y particular solution of the IVP
 $y' + 4y = 1.4, y = ce^{-4x} + 0.35, y(0) = 2$

OR

- b Solve the IVP on any open interval I on the positive x -axis containing $x = 1$
 $x^3y''' - 3x^2y'' + 6xy' - 6y = 0, y(1) = 2, y'(1) = 1, y''(1) = -4$

- 20 a Develop the two half-range expansions of the function

$$f(x) = \begin{cases} \frac{2k}{L}x, & \text{if } 0 < x < \frac{L}{2} \\ \frac{2k}{L}(L - x), & \text{if } \frac{L}{2} < x < L \end{cases}$$

OR

- b Enumerate that $f = \text{const}$ is periodic with any period but has no fundamental period.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – SOFTWARE SYSTEMS (Five year Integrated)

DESIGN AND ANALYSIS OF ALGORITHMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

- 1 The Complexity of Binary Search algorithm is
(i) $O(n)$ (ii) $O(\log n)$
(iii) $O(n^2)$ (iv) $O(n \log n)$
- 2 Why we need a binary tree which is height balanced?
(i) avoid skewing (ii) quick operation
(iii) save memory (iv) simplify access
- 3 Splay trees are preferable for
(i) easy programming (ii) efficient memory
(iii) quick searching (iv) easy program and fast access recent items
- 4 Identify the correct statement in B+ Trees which allows?
(i) Rapid random access (ii) Rapid sequential access
(iii) Both (i) and (ii) (iv) None of these
- 5 The technique followed in Strassens Matrix multiplication is
(i) Greedy method (ii) Divide and Conquer
(iii) Backtracking (iv) Linear search
- 6 The travelling sales man problem can be solved by
(i) spanning tree (ii) Bellman Ford Algorithm
(iii) Minimum spanning tree (iv) DFS traversal
- 7 The problem solved by dynamic programming.
(i) Merge sort (ii) Longest common subsequence
(iii) Binary search (iv) Quick sort
- 8 If the Backtracking reaches complete solution then
(i) Backtrack to root (ii) continue to other possibility
(iii) Traverses from different root (iv) All of these
- 9 Identify which is not a branch and bound to generate branches?
(i) LIFO Branch & Bound (ii) FIFO Branch & Bound
(iii) Lower cost Branch & Bound (iv) Higher Cost Branch & Bound
- 10 The Worst case efficiency of problem solving in polynomial time is
(i) $O(P(n))$ (ii) $O(P(n \log n))$
(iii) $O(P(m \log n))$ (iv) $O(P(n^2))$

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 5 = 25)

- 11 a Solve the following recurrence relation using Master's theorem-
 $T(n) = 3T(n/2) + n^2$.

OR

- b Develop steps need to searching on element in on AVL Tree.

Cont...

- 12 a List out the steps to create a Splay tree.
OR
b Make a note about B+ tree with example.
- 13 a Perform Merge sort using Divide and Conquer method.
OR
b Compute topological sorting using Greedy method.
- 14 a Provide what are steps in dynamic programming solution?
OR
b Illustrate Backtracking method for 4 Queen problem.
- 15 a How to solve 0/1 Knapsack problem in Branch and bound method.
OR
b Discuss about Non deterministic algorithm problems.

SECTION -C (40 Marks)

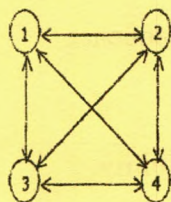
Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 8 = 40)

Question No. 16 is Compulsory

- 16 Summarize analysis of algorithms on simple data structures.
- 17 a Enumerate Potential method of Amortizes analysis.
OR
b Illustrate Indexed sequential access with example.
- 18 a Evaluate Quick sort in the following numbers: 12,98,67,53,22,66,30,20.
OR
b Develop a minimum cost Spanning tree using Prim's algorithm.
- 19 a For the following graph find minimum cost tour for the traveling salesperson problem:



The cost adjacency matrix =

0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

- OR
- b Summarize the terminologies used in Backtracking method.
- 20 a Solve the following 0/1 knapsack problem in branch and bound.
Consider the instance: $M = 15$, $n = 4$, $(P_1, P_2, P_3, P_4) = (10, 10, 12, 18)$ and $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$.
OR
b Compare the classes of NP-Hard and NP-Complete with diagram.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – SOFTWARE SYSTEMS (Five Year Integrated)

DISCIPLINE SPECIFIC ELECTIVE – I DATA MINING

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 _____ can be mined from many different kinds of databases.
(i) Data pattern (ii) Data mind
(iii) Data set (iv) Data predict
- 2 Outliers may be detected by _____.
(i) sampling (ii) cleaning
(iii) clustering (iv) reduction
- 3 _____ can be used as a data reduction techniques since it allows a large data set.
(i) reduction (ii) Sampling
(iii) Cluster (iv) cleaning
- 4 How many forms of data analysis and predication involve data cleaning?
(i) four (ii) one
(iii) three (iv) two
- 5 The _____ contain a rich and dynamic collection of hyperlink information and web page.
(i) Link (ii) Server
(iii) web (iv) Client

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a What is data mining?
OR
b Write short notes on clustering.
- 7 a Describe the graph displays of basic statistical class.
OR
b How to design GUI based on a data mining query language?
- 8 a Explain the apriori algorithm to find frequent item sets using candidate generation.
OR
b What is linear and multiple regression?
- 9 a How does the k-means algorithm work?
OR
b Explain in detail about the text data analysis and information retrieval.

Cont...

- 10 a Describe the data mining applications for the telecommunication industry.
OR
b Is data mining merely manager's business or everyone's business? Explain

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a Explain the architecture of a typical data mining system.
OR
b Briefly explain about classification of data mining.
- 12 a Elucidate about data cleaning.
OR
b Explain about a multidimensional data model.
- 13 a Describe about FP tree.
OR
b Evaluating the accuracy of a classifier. Summarize.
- 14 a Explain categories of major clustering methods.
OR
b Briefly discuss about challenges in mining data streams.
- 15 a Briefly explain about the various applications of data mining.
OR
b Describe the data mining applications for the web mining.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2024
(Sixth Semester)

Branch – SOFTWARE SYSTEMS (Five Year Integrated)

ARTIFICIAL INTELLIGENCE

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Select three fundamental areas required in a level of mathematical formalization in a formal science.
(i) Logic, function and computation (ii) logic, computation, and probability
(iii) Algorithm, logic and function (iv) Input, computation and probability
- 2 Specify the range of values of set membership in Fuzzy logic.
(i) 0 to 1 (ii) -1 to 1
(iii) 0 and 1 only (iv) 0 to infinity
- 3 Identify that the Bayesian network is a
(i) Complete graph (ii) Euler graph
(iii) Undirected weighted graph (iv) Directed acyclic graph
- 4 Which policy yields highest expected utility?
(i) Expected utility policy (ii) High performance policy
(iii) Optimal policy (iv) Derived policy
- 5 Choose the unsupervised learning task
(i) Clustering (ii) Rewards or punishment
(iii) Input-output pairs (iv) All of these

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Determine which searching strategy followed in Breadth first search.
OR
b Show that the Backtracking search is used for depth first search.
- 7 a Distinguish general purpose ontologies from special purpose ontologies with two major characteristics.
OR
b Define Fuzzy Logic with an example.
- 8 a State that the uncertain reasoning through an example.
OR
b Develop a variable elimination algorithm for inference in Bayesian network.
- 9 a Derive the consequences of utility theory from axioms.
OR
b Define the Bellman equation for utilities with 4 X 3 world.
- 10 a Categorize the list of components to be learned by agents.
OR
b Differentiate feed-forward network over recurrent network.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a Illustrate Genetic algorithm for digit strings representing 8 queen states.
OR
b Apply Alpha-Beta pruning technique in Minimax tree.
- 12 a Examine first order predicate logic.
OR
b Elucidate the Fuzzy rules with example.
- 13 a Create a method for constructing Bayesian networks.
OR
b Describe Hidden Markov model example: Localization.
- 14 a Classify six constraints which address the primary issue of utility theory.
OR
b Demonstrate single move game's components and solution with example.
- 15 a Enumerate the types of feedback that determines the three types of learning.
OR
b Evaluate exploration of Active Reinforcement learning.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch – **SOFTWARE SYSTEMS** (Five years Integrated)

SOCIAL NETWORK ANALYSIS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 x 1 = 10)

- 1 _____ provides a simplified view of network traffic and helps with resource utilization.
 (i) Network visualization (ii) Continuous visualization
 (iii) Social visualization (iv) Discrete visualization
- 2 SNA expands _____.
 (i) Social Network Analysis (ii) Social number applications
 (iii) Social Network android (iv) Secondary Network applications
- 3 Edges are directed and paths can be traversed only along the direction of the edges is known as _____.
 (i) Undirected Graph (ii) Directed Graph
 (iii) Complete Graph (iv) Bipartite Graph
- 4 _____ assumes triads in networks to gravitate toward stable configurations.
 (i) Structurally instable (ii) Structural information
 (iii) Structural Balance (iv) Cultural instable
- 5 A field that studies economic phenomena by using network science tools and concepts is known as _____.
 (i) Network Science (ii) Science and Economics
 (iii) Network Economics (iv) Political economics
- 6 The process of spreading information through a social network is known as _____.
 (i) Information Destruction (ii) Information construction
 (iii) Intentional distraction (iv) Information Diffusion
- 7 _____ is a graph or a network with non-trivial topological features.
 (i) Simple network (ii) Social network
 (iii) Strucutral network (iv) complex network
- 8 Network analysis can help investigate non-traditional financial intermediation is known as _____.
 (i) Financial intermediation (ii) Domestic intermediation
 (iii) Ownership intermediation (iv) Business intermediation
- 9 _____ is a network in which one vertex is connected to all other vertices.
 (i) Directed graph (ii) Simple graph
 (iii) Complete graph (iv) Multigraph
- 10 _____ is a (sub)network consisting of three vertices.
 (i) Bipartite (ii) Triad
 (iii) Discrete (iv) Binary

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 5 = 25)

- 11 a Explain the sources of network data.
OR
b Elaborate the basics of Graph theory.
- 12 a Determine the strength on twitter for sentimental analysis.
OR
b Illustrate the structural balance on networks.
- 13 a Recommend the connection methods to diffusion of Ideas and Behaviors.
OR
b Evaluate the role of basic properties of reproductive number.
- 14 a Discuss the experimental studies of power and exchange in social networks.
OR
b Apply the principles in 2 node and 3 node paths.
- 15 a Sketch the working methodology for finding betweenness.
OR
b Determine the applications of network link analysis.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 8 = 40)

Question No. 16 is Compulsory

- 16 Categorize the tools for network data.
- 17 a Classify the fundamental concepts in Network analysis.
OR
b Enumerate the principles of local bridges and weak ties.
- 18 a Elucidate the application of Information diffusion.
OR
b Criticize the SIS epidemic model in model for analysis.
- 19 a Determine the power in social networks.
OR
b Analyze the solution provided by Nash bargaining model.
- 20 a Categorize the importance of Social network graph.
OR
b Justify the spectral methods for mining graph is social media.

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch – **SOFTWARE SYSTEMS** (Five years Integrated)

MODERN DATABASE SYSTEMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 x 1 = 10)

- 1 Which of the following techniques is used in parallel query optimization?
(i) Data partitioning (ii) Transaction locking
(iii) Data replication (iv) Query caching
- 2 Which component is crucial for optimizing distributed queries?
(i) Indexing (ii) Query decomposition
(iii) Data compression (iv) Data replication
- 3 In data modeling for big data, a key focus is on:
(i) Relational integrity (ii) Fixed schema flexibility
(iii) Handling unstructured data (iv) Normalization of tables
- 4 What is the primary advantage of NoSQL databases for big data?
(i) Strong consistency (ii) Scalability
(iii) Limited schema flexibility (iv) High disk space usage
- 5 In Redis, data is primarily stored in:
(i) Disk-based tables (ii) Column families
(iii) In-memory data structures (iv) Distributed file systems
- 6 Which NoSQL model is most suited for time-series data?
(i) Key-value store (ii) Graph store
(iii) Column-oriented store (iv) Document store
- 7 In a graph database like Neo4j, relationships are represented as:
(i) Edges (ii) Documents
(iii) Columns (iv) Keys
- 8 Which of the following use cases is best suited for a graph database?
(i) Storing large documents (ii) Social network analysis
(iii) Financial transactions (iv) Simple key-value data storage
- 9 Which component in HDFS is responsible for managing metadata?
(i) DataNode (ii) Task Tracker
(iii) NameNode (iv) Job Tracker
- 10 Microsoft Azure is a platform primarily used for:
(i) Local database management (ii) Cloud computing and storage
(iii) Real-time analytics (iv) Graph database operations

Cont...

SECTION - B (25 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks

(5 x 5 = 25)

- 11 a Explain the Architecture of parallel databases.
OR
b Prepare and state the ANSI/SPARC Architecture.
- 12 a Determine the NoSQL data Models with example.
OR
b Classify the various types of NOSQL database.
- 13 a Evaluate the in-memory Key-value store in NoSQL.
OR
b Illustrate the Hbase Architecture.
- 14 a Justify in detail about the XML databases.
OR
b Explain about the MongoDB in detail.
- 15 a Sketch about the Data Warehouse Integration.
OR
b Evaluate in detail about the Big data Application.

SECTION -C (40 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks
Question No. 16 is Compulsory

(5 x 8 = 40)

- 16 Elucidate the Distributed Query Processing and Optimization.
- 17 a Justify the Data Model? Explain the various types of data models.
OR
b Develop the Basic Principles of NoSQL models.
- 18 a Explain in detail about Apache Cassandra.
OR
b Enumerate about the Amazon DynamoDB NoSQL database service.
- 19 a Explain` the Structure and features of Neo4j.
OR
b Criticize about the Concepts of Orient DB with example.
- 20 a Design the Microsoft Azure in detail.
OR
b Elucidate about the Apache Hadoop Architecture.

Z-Z-Z

END