

Examination:	November-December 2018	Date:	19-11-18
Branch:	Computer Engineering	Subject:	AM-IV
Class/SEM:	SE/IV	Paper Code:	40558
Examination:	November-December 2018	Date:	27-11-18
Branch:	Computer Engineering	Subject:	AOA
Class/SEM:	SE/IV	Paper Code:	54765
Examination:	November-December 2018	Date:	27-11-18
Branch:	Computer Engineering	Subject:	AOA
Class/SEM:	SE/IV	Paper Code:	55800
Examination:	November-December 2018	Date:	3/12/2011
Branch:	Computer Engineering	Subject:	COA
Class/SEM:	SE/IV	Paper Code:	57916
Examination:	November-December 2018	Date:	3/12/2018
Branch:	Computer Engineering	Subject:	COA
Class/SEM:	SE/IV	Paper Code:	23693
Examination:	November-December 2018	Date:	10/12/2018
Branch:	Computer Engineering	Subject:	CG
Class/SEM:	SE/IV	Paper Code:	60317
Examination:	November-December 2018	Date:	10/12/2018
Branch:	Computer Engineering	Subject:	DMS
Class/SEM:	SE/IV	Paper Code:	22552
Examination:	November-December 2018	Date:	14-12-18
Branch:	Computer Engineering	Subject:	OS
Class/SEM:	SE/IV	Paper Code:	55382
Examination:	November-December 2018	Date:	20-12-18
Branch:	Computer Engineering	Subject:	CG
Class/SEM:	SE/IV	Paper Code:	58401
Examination:	November-December 2018	Date:	21-12-18
Branch:	Computer Engineering	Subject:	OOPM
Class/SEM:	SE/IV	Paper Code:	26233

camp / smiv / CBCAs / AM 1v / 19/11/2018

Paper / Subject Code: 40501 / Applied Mathematics-IV

QP CODE: 40558

(3 hours)

Max. Marks: 80



N.B. (1) Question No. 1 is compulsory.

- (2) Answer any three questions from Q.2 to Q.6.
- (3) Use of Statistical Tables permitted.
- (4) Figures to the right indicate full marks.

Q.1

- (a) Find all the basic solutions to the following problem:
Maximize $z = x_1 + x_2 + 3x_3$ subject to

$$\begin{aligned} x_1 + 2x_2 + 3x_3 &= 9 \\ 3x_1 + 2x_2 + 2x_3 &= 15 \end{aligned}$$

05

- (b) Evaluate $\oint z \, dz$ from $z = 0$ to $z = 1 + i$ along the curve $z = t^2 + it$.

05

- (c) A sample of 100 students is taken from a large population. The mean height of the students in this sample is 160 cm. Can it be reasonably regarded that in the population, the mean height is 165 cm, and the standard deviation is 10 cm?

05

- (d) The sum of the Eigen values of a 3×3 matrix is 6 and the product of the Eigen values is also 6. If one of the Eigen value is one, find the other two Eigen values.

05

Q.2

- (a) Evaluate $\oint \frac{\sin^2 z}{(z - \pi/6)^n} \, dz$ where c is the circle $|z| = 1$ for $n = 1, n = 3$

06

- (b) The following data is collected on two characters. Based on this, can you say that there is no relation between smoking and literacy? Use Chi-square test at 5% Level of significance.

06

	Smokers	Non-smokers
Literates	83	57
Illiterates	45	68

- (c) Solve the following LPP using Simplex Method

$$\text{Maximize } z = 3x_1 + 5x_2$$

subject to

$$3x_1 + 2x_2 \leq 18,$$

08

$$\begin{aligned} x_1 &\leq 4, \\ x_2 &\leq 6, \\ x_1, x_2 &\geq 0 \end{aligned}$$

Q.3

- (a) Find the Eigen values and Eigen vectors of the following matrix.

06

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

- (b) The incomes of a group of 10,000 persons were found to be normally distributed with mean of Rs. 750 and Standard deviation of Rs. 50. What is the lowest income of richest 250?

06

- (c) Expand $\frac{z^2 - 1}{z^2 + 5z + 6}$ around $z = 0$.

08

Turn over

- Q.4 (a) The mean breaking strength of cables supplied by a manufacturer is 1800 with S.D 100. By a new technique in the manufacturing process it is claimed that the breaking strength of the cable has increased. In order to test the claim a sample of 50 cables are tested. It is found that the mean breaking strength is 1850. Can we support the claim at 1% LOS. 06

- (b) Using the Residue theorem, Evaluate $\int_0^{2\pi} \frac{d\theta}{5-3\cos\theta}$ 06

- (c) (i) Out of 1000 families with 4 children each, how many would you expect to have (I) at least one boy, (II) at most 2 girls. 04+04
(ii) Find the Moment Generating Function of Poisson distribution and hence find its mean.

- Q.5 (a) Check whether the following matrix is Derogatory or Non-Derogatory:

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & -3 & 3 \end{bmatrix}$$

- (b) The means of two random samples of sizes 9 and 7 are 196 and 199 respectively. The sum of the squares of the deviations from the mean is 27 and 19 respectively. Can the samples be regarded to have been drawn from the same normal population? 06

- (c) Use the dual simplex method to solve the following L.P.P.
Minimise $z = 6x_1 + 3x_2 + 4x_3$
subject to

$$x_1 + 6x_2 + x_3 = 10$$

$$2x_1 + 3x_2 + x_3 = 15$$

$$x_1, x_2, x_3 \geq 0$$

- Q.6 (a) Show that the matrix A satisfies Cayley-Hamilton theorem and hence find A^{-1} .

$$\text{Where } A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$$

- (b) The Probability Distribution of a random variable X is given by

$$\begin{array}{cccccc} X : & -2 & -1 & 0 & 1 & 2 & 3 \\ P(X=x): & 0.1 & k & 0.2 & 2k & 0.3 & k \end{array}$$

Find k, mean and variance. 06

- (c) Using Kuhn-Tucker conditions, solve the following NLPP

$$\text{Maximize } z = x_1^2 + x_2^2$$

subject to

$$x_1 + x_2 - 4 \leq 0$$

$$2x_1 + x_2 - 5 \leq 0$$

$$x_1, x_2 \geq 0$$

08



Camp / CBS QS. / IV / AOA / 27/11/18
Paper / Subject Code: 38902 / ANALYSIS OF ALGORITHM

(3 Hours)

Total Marks: 80

- N.B: (1) Question No.1 is compulsory
(2) Attempt any three questions of the remaining five questions
(3) Figures to the right indicate full marks
(4) Make suitable assumptions wherever necessary with proper justifications

- Q.1 (a) Explain asymptotic notations. (5)
(b) Explain Randomized algorithms. (5)
(c) Write an Algorithm for Merge sort and derive its best case and worst case complexity. (10)
- Q.2 (a) Explain Master's Theorem to find the complexity of a recurrence relation (10)
(b) Explain Naïve string matching algorithm with example. (10)
- Q.3 (a) Explain Single source shortest path algorithm using Dynamic programming with suitable example. (10)
(b) Write an Algorithm for Graph Coloring problem. Also derive its complexity. (10)
- Q.4 (a) Write an Algorithm for knapsack problem using Greedy method. (10)
Also derive its complexity
(b) Explain the using Travelling Salesman Problem using Branch and Bound (10)
- Q.5. (a) Explain Flow shop scheduling technique. (10)
(b) Write an Algorithm to find minimum cost spanning tree. Also derive its complexity. (10)
- Q.6. Write Short notes on (any two) (20)
(a) Strassen's matrix multiplication
(b) Job- Sequencing with deadlines.
(c) Multistage Graphs



Time Duration: 03Hrs

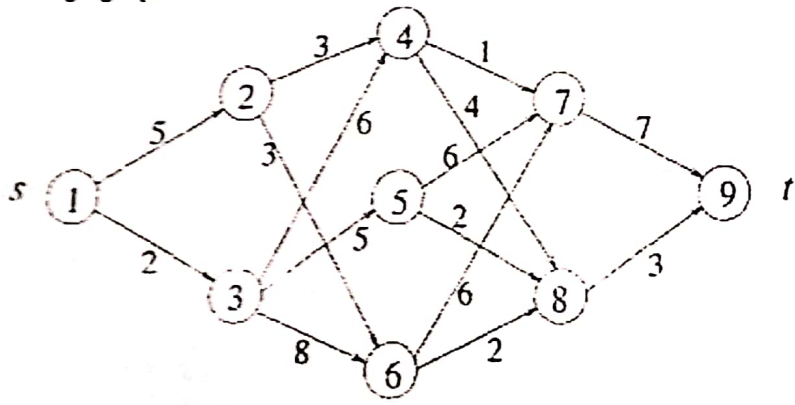
Marks: 80

Note: Question 1 is compulsory.

Attempt any three out of remaining five questions.

Make suitable assumptions whenever necessary.

- Q.1 [a] Explain the Strassen's matrix multiplication concept with an example. [10]
 Derive it's time complexity.
- [b] Apply the quick sort algorithm to sort the list. E,X,A,M,P,L,E in alphabetical order. Analyze the best case, worst case and average case complexities of quick sort. [10]
- Q.2 [a] Solve following problem of sum of subset and draw portion of state space tree. [10]
 $w = (5, 7, 10, 12, 15, 18, 20)$ and $m = 35$.
 Find all possible subsets of w that sum to m .
- [b] What is single source shortest path algorithm. Write an algorithm to find single source shortest path using greedy methods [10]
- Q.3 [a] Prove that vertex cover problem is NP complete. [10]
 [b] Explain various string matching algorithms. [10]
- Q.4 [a] Find the minimum cost path from s to t in the following figure using multistage graph. [10]



- [b] Describe the Travelling sales person problem and discuss how to solve it using dynamic programming with example. [10]
- [a] What is longest common subsequence problem? Find the LCS for the following problem. [10]
- [b] Write a short note on 8 queen problem, Write an algorithm for the same. [10]
- Write a short note on (Any two)
1. Branch and Bound Strategy. [10]
 2. Algorithms to find minimum spanning tree. [10]
 3. Recurrences.

Camp | sem IV | CBCGS | COA | 3/12/2018.

Paper / Subject Code: 40503 / Computer Organization and Architecture

(3Hrs)

Max Marks: 80

IB: 1. Question No.1 Compulsory.

2. Solve any THREE from Q.2 to Q.6

3. Assume suitable data whenever necessary with justification.



Q1. Answer any four questions

- (A) Explain Instruction and Instruction Cycle. (05)
- (B) Explain Booths algorithm with an example (05)
- (C) Give different instruction formats. (05)
- (D) Describe the memory hierarchy in the computer system (05)
- (E) Explain Superscalar Architecture. (05)

- Q2. (A) Explain Branch Predication Logic and delayed branch. (10)
- (B) List and explain various data dependencies, data and branch hazards that occur in the computer system. (10)

- Q3. (A) A program having 10 instructions (without Branch and Call instructions) is executed on non-pipeline and pipeline processors. All instructions are of same length and having 4 pipeline stages and time required to each stage is 1nsec. (10)

i) Calculate time required to execute the program on Non-pipeline and Pipeline processor.

ii) Calculate Speedup

- (B) What is Microprogram? Write microprogram for following operations. (10)

i) ADD R1, M, Register R1 and Memory location M are added and result store at Register R1.

ii) MUL R1, R2 Register R1 and Register R2 are multiplied and result store at Register R1.

- Q4. (A) Explain Bus Contention and different method to resolve it. (10)
- (B) Describe memory segmentation in detail. Explain how address translation is performed in virtual memory. (10)

- Q5. (A) State the various types of data transfer techniques. Explain DMA in detail. (10)
- (B) Consider a cache memory of 16 words. Each block consists of 4 words. Size of the main memory is 256 bytes. Draw associative mapping and calculate TAG, and WORD size. (10)

- Q6. (A) Write short note on Performance measures (10)
- (B) Draw and explain floating point addition subtraction algorithm. (10)

mp | CBS GS | sem IV | CBS GS | 3/12/18 .

Paper / Subject Code: 38903 / COMPUTER ORGANIZATION AND ARCHITECTURE

Q.P. Code :23693

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question.No.1 is compulsory.
 2. Solve any three question out of remaining five question.
 3. Assume suitable data if necessary.
 4. Figures to right indicate marks.

1. Solve any four out of five 20
- a) Write a note on scanner
 - b) Draw and explain the flowchart of Add & shift method of integer multiplication
 - c) Briefly explain Flynn's classification
 - d) With the help of diagram, explain Von- Neumann's architecture
 - e) What are the major functions of I/O module? 10
2. a) Divide 6 by 2 using restoring division algorithms 10
- b) Discuss various pipeline hazards with example
3. a) Multiply (-2) and (2) using Booth's Algorithm. 10
- b) Consider the string 9,4,2,3,2,9,5,9,4,2,6,7,5,3,4,2,3,2,4,
Find the page faults for 3 frames using FIFO, Optimal & LRU page replacement policies 10
4. a) Explain various cache mapping function 10
- b) Draw and explain instruction cycle with interrupt execution 10
5. a) Explain the various characteristics of memory 10
- b) Describe the register organization within the CPU 10
6. a) What is bus arbitration? Explain its techniques 10
- b) What is the need of DMA? Explain its various techniques of data transfer 10



Comp / CB C.G.S / sem IV / C.G. / 10/12/18

Paper / Subject Code: 40504 / Computer Graphics

Duration: 3 Hrs

Total Marks : 80

- 3.: 1) Question No. 1 is Compulsory.
2) Attempt any three questions, from remaining five questions.
3) Figure to the right indicates full marks

- | | |
|---|----|
| A) Compare Raster and Random Scan Techniques . | 5 |
| B) What are the disadvantages of DDA algorithm? | 5 |
| C) Explain inside outside test used in filling algorithm. | 5 |
| D) What are Aliasing & Antialiasing? Explain any one Antialiasing method. | 5 |
| | |
| A) Explain Liang Barsky line clipping algorithm. Apply this algorithm to the line with coordinates (35,60) and (80,25) against the window $(X_{min}, Y_{min}) = (10,10)$ and $(X_{max}, Y_{max}) = (50,50)$ | 10 |
| B) Derive the matrix for 2D rotation about an arbitrary point. | 10 |
| | |
| A) Explain the Cohen-Sutherland line clipping algorithm with suitable example. | 10 |
| B) What is meant by Parallel and Perspective Projections? Derive matrix for Perspective projection. | 10 |
| | |
| A) Specify midpoint circle algorithm, using the same, plot the circle whose radius is 8 units and center is at (10,10) | 10 |
| B) Explain any one Polygon clipping algorithm | 10 |
| | |
| A) Explain Bezier curve with its properties and construct | 10 |
| B) Explain Gouraud and Phong Shading along with their advantages and disadvantages. | 10 |
| | |
| Write Short Note on (Any four) | 20 |
| | |
| (a) Depth Buffer method | |
| (b) Halftone and Dithering techniques | |
| (c) Fractals | |
| (d) Koch Curve | |
| (e) Area Subdivision method | |



Comp / sem IV / CBSCS / DMS / 10/12/18

Paper / Subject Code: 38904 / DATABASE MANAGEMENT SYSTEMS

Q. P. Code:-22552

(3 Hours)

Total Marks: 80

N.B.: (1) Question No.1 is compulsory.

(2) Solve any **three** questions out of the remaining questions.

(3) Make **suitable** assumptions if needed.

1. (a). Explain ACID properties.

(b) Discuss Generalization and Specialization in EER model.

(c) Explain Aggregate Functions in SQL.

(d) Describe Triggers with example.

2. (a) Define Normalization. Discuss different Normalization Techniques with example. 10

(b) Consider the following database schema: 10

Employee(employee_name, street, city, date_of_join)

Works(employee_name, company_name, salary)

Company(company_name, city)

Manages(employee_name, manager_name)

Solve the following queries using SQL:

i. Give all employee of ABC Company a 25% rise.

ii. Find all employees who live in the same cities and on the same street as their manager.

iii. Find all employees who join in the month of April.

iv. Delete the employee Jennifer belonging to XYZ Company.

3. (a) Explain types of integrity constraints with example. 10

(b) Describe the overall architecture of DBMS with suitable diagram. 10

4. (a) Draw an ER Diagram and convert it into relational model for a Hospital with a set of patients and set of doctors. Associate with each patient a log of various tests and examinations conducted. 10

(b) Explain Security and Authorization in DBMS. 10

5. (a) Explain the following Relational Algebra Operations with example: 10

i. Cartesian Product iii. Generalized Projection

ii. Natural Join iv. Union

(b) Discuss conflict serializability and view serializability with examples. 10

6. Write Short notes on: 20

(a) Steps in Query Processing

(b) Role of Database Administrator

(c) Deadlocks

(d) Data Independence



Comp | Sem. IV | C B C GS | OS | 14/12/18

Paper / Subject Code: 40505 / Operating System

Duration: 3 hours

Marks: 80

- NB: (1) Question no. 1 is compulsory.
(2) Attempt any three out of remaining five questions.
(3) Assume data if required



Q-1 Attempt any FOUR

- a Explain the difference between monolithic kernel and micro kernel. 5
- b What is mutual exclusion? Explain its significance. 5
- c Discuss various types of scheduler. 5
- d Explain various process states with diagram. 5
- e What is the effect of page size on performance of operating systems? 5
- 2-a What is operating system? Explain various functions and objectives. 10
- b What is deadlock? Explain the necessary and sufficient condition for deadlock. 10
- 3-a Explain counting semaphore with examples. 10
- b Consider the processes P1, P2, P3, P4 given in the below table, arrives for execution in the same order, with Arrival Time 0, and given Burst Time. Draw the Gantt chart and find the average waiting time using the FCFS and SJF (Non-Pre-emptive) scheduling algorithm. 10

process	Burst time
P0	21
P1	3
P2	6
P3	2

- 4-a What is paging? Explain LRU, FIFO and Optimal page replacement policy for the following string. Page frame size is 4. Calculate the hit ratio for the same. 10
1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2
- b Explain data structures used in banker's algorithms with example. 10
- 5-a What is system call? Explain any five system call in details. 10
- b Explain virtual memory concept with respect to paging, segmentation and TLB. 10
- Q-6 Write short notes on: (any two): 20
- (a) Linux Virtual file system
- (b) Resource Allocation graph
- (c) Readers and writer problem using Semaphore
- (d) Compare disk scheduling algorithms.

(3 Hours)

Total Marks: 80

Q1. Answer the following

20M

- a) State the properties of B-Spline Curves.
- b) Differentiate between Raster scan display and Random scan display.
- c) Write matrix to perform 3D reflection about xy, yz and xz planes
- d) Explain Homogenous co-ordinate system.

Q2 a) Explain drawback of the Sutherland Hodgman polygon clipping algorithm with 10M example.

- b) (i) Derive the steps required to perform 2-Dimension fixed point scaling with 10M the example.
(ii) Derive the matrix in 2D for reflection of an object about a line $y = mx + c$

Q3 a) Explain Flood fill algorithm using 8 connected method. What is its advantage 4M over boundary fill algorithm?

- b) Explain Cohen Sutherland line clipping algorithm. Apply the algorithm to clip 8M the line segment A(120,70) and B(190,80) against the window Co-ordinate $X_{wmin} = 80$, $X_{wmax} = 180$, $Y_{wmin} = 50$ and $Y_{wmax} = 120$.

Q4 a) Construct the Bezier curve of order 3 and with 4 polygon vertices 10M A(1,1), B(2,3), C(4,3) and D(6,4).

- b) Explain scan line hidden surface algorithm in detail. 10M

Q5 a) Derive the 3-D transformation for the rotation about an arbitrary axis. 10M

- b) Explain Parallel and Perspective projection? Derive the matrix for perspective 10M projection.

Q6 a) Write and explain the depth buffer algorithm for detecting visible surface. 10M

- b) Write short note on any two: 10M

(i) Scan line polygon filling algorithm.

(ii) Phong Shading algorithm.

(iii) Viewing Transformation



Comp / IM / CBSE / OUP / 23-12-18

Paper / Subject Code: 49306 / OBJECT ORIENTAED PROGRAMMING METHODOLOGY

Q. P. Code : 26233

(3 Hours)

Total Marks : 80

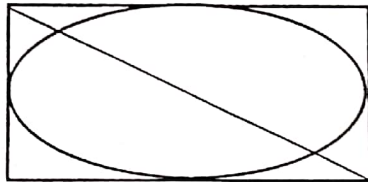
N.B 1) Question no. 1 is compulsory.

2) Attempt any three from remaining questions.

- Q. 1 a Explain any five features of JAVA language [5]
b Differentiate between abstract class and interface [5]
c Write a program to find the largest of three integers accepted from command line [5]
d Explain various access specifiers in JAVA. [5]
- Q. 2 a Explain different types of relationships among entities. [10]
Define the relationships among the objects of given sentences:
1) Employee works on project.
2) Customer places order.
3) WebOrder, TelephoneOrder is a kind of order. [10]
b What is the advantage of clause "finally"
List any 2 exceptions defined in Java. Explain use of try, catch and use of multiple catch block. [10]
- Q. 3 A Create class Student (roll number, name).
Class Test (mark1, mark2) inherit student class.
Create interface Sport with data member as sports_mark and method set_sportMark().
Create class Result which extends Test and implements Sport and has a method named calculate which finds total as (total=marks1+marks2+sports_mark) and method which display all the details.
Create an object of Result class and show result.
- b What role does "interface" play in multiple inheritance. Explain with example. [10]
Demonstrate use of interface to achieve polymorphism with example.



- Q. 4 a Write a JAVA program to count the number of upper case, lower case, blank [10]
 spaces and digits in a string.
- b Which are the two different ways to create a thread? Write a multithreaded [5]
 program to show inter-leaving of actions from 2 threads and display
 ABABABABABABAB
- c Write an applet program to display [5]



- Q. 5 a What is applet? Draw and explain lifecycle of an applet. [10]
- b Write a program to check if the year entered is leap or not. [5]
- c Compare Method Overloading and Method Overriding [5]
- Q. 6 a Explain Vectors and its operations (any four) with suitable example / [10]
 program.
- b Explain `System.arraycopy()` method with example. [5]
- c Write a program to implement bubble sorting algorithm for sorting numbers [5]
 in descending order.
