14801

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14801

MCA 1 - Sem. (Main) Exam., Dec. - 2018

MCA – 101 Discrete Mathematics

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 32

Instructions to Candidates:

*Attempt **all questions,** Marks of question are indicated against each question.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

Q.1 Answer the following questions in one line: [10 ×1=10]

(a) Define symmetric difference of two sets.

(b) Define Identity Relation.

(c) Define Mapping.

(d) Define Combinations.

(e) Define Lattices.

(f) Define Principle of Duality.

(g) Define Coset.

(h) Define Path.

(i) Define Permutation Group.

(j) Define Eulerian Path.

Q.2 Answer each part in maximum 50 words: [5×3=15]

(a) Define Equivalence Relation.

(b) Use truth table, prove the De Morgan's Law.

$\sim (p \wedge q) \equiv \sim p \vee \sim q$

(c) Define Eigen Values and Eigen Vectors.

(d) Explain principle of Inclusion and Exclusion.

(e) Define Regular and Complete graph.

Q.3 Answer each part in maximum 150 words: [5×4=20]

(a) Let A, B and C are arbitrary sets. Show that

(i) $(A - B) - C = A - (B \cup C)$

(ii) $(A - B) - C = (A - C) - B$

(b) If for any element a in a group G, $a^2 = e$, then prove that G is an abelian group.

(c) Show that –

$$P(n): 1^2 + 2^2 \ldots\ldots + n^2 = \frac{n(n+1)(2n+1)}{6}, n \geq 1$$

By mathematical induction.

(d) Let V = {a, b, c, d, e} and

E = {(a, b), (a, c), (a, d) (b, c), (b, c), (c, d), (c, e)}

Draw the diagram of the graph and find the degree of each of the vertex.

(e) If f: A → B be a one – one onto mapping from A to B and g : B → A be the inverse of f then, prove that :

$$gof = I_A \text{ and } fog = I_B$$

Q.4 (a) Show that the set Q^+ of the positive rational numbers form an abelian group for the operation * define as: $a * b = \frac{ab}{2}, \forall\ a,b \in Q^+$ [2×10=20]

(b) In the set of natural numbers N = {1, 2, 3, ...}

Show that the relation R defined as

$$a\ R\ b \Leftrightarrow a = b^k$$

for a, b, K ∈ N, is a partial order relation.

Q.5 A simple graph (having no self-loop and no multiple edges) with n vertices and K components can have at the most $\frac{(n-k)(n-k+1)}{2}$ edges. [15]

OR

Q.5 State and Prove Cayley Hamilton theorem. [15]

14802

Roll No. _____ Total No of Pages: 2

14802

MCA I - Sem. (Main) Exam., Dec. - 2018

MCA – 102 Programming in C & C++

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 32

Instructions to Candidates:

*Attempt **all questions,** Marks of question are indicated against each question.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

Q.1 Answer the following questions in 1-2 lines. [1×10=10]

(a) What is a flowchart?

(b) Define Array.

(c) What is the main difference between a Structure and a Union?

(d) What is the use of feof()?

(e) What is the use of typedef?

(f) What is a default constructor?

(g) What is inheritance?

(h) What is the difference between new/delete and malloc/free?

(i) What happens when a function throws an exception that was not specified by an exception specification for this function?

(j) Is there anything you can do in C++ but not in C?

Q.2 Answer the following questions in 50 words: [5×3=15]

(a) Explain primitive data types in C.

(b) List any 3 file modes in C?

(c) What is "this" pointer? Explain how it is used.

(d) What is pure virtual function? Why and when is it used?

(e) Explain public, private and protected access specifiers in C++.

Q.3 Answer the following questions in approximately 150 words each: [4×5=20]

(a) Give a programming example that overloads == operator with its use.

(b) What is a friend function? Give an example and also mention the merits and demerits of using a friend function.

(c) Explain command line argument in C with an example.

(d) Explain the following bitwise operators:

(i) Bitwise AND

(ii) Bitwise OR

(iii) Bitwise Left Shift

(iv) Bitwise Right Shift

Q.4 (a) What is the difference between a calling function and a called function? Also explain the difference between call by value and call by reference with the help of a suitable example. [10]

(b) Define Object-Oriented Programming and explain the features of Object-Oriented Programming. How is it different from Procedure-Oriented Programming? [10]

Q.5 Write a C function isprime(num) that accepts an integer argument and returns 1 if the argument is prime, 0 otherwise. Write a C program that invokes this function to generate prime numbers between the given ranges. [15]

OR

What do you understand by polymorphism? Write a program in C++ to demonstrate the use of function overloading. [15]

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MCA I - Sem. (Main) Exam., Dec. - 2018

MCA – 103 Operating System

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 32

Instructions to Candidates:

*Attempt **all questions,** Marks of question are indicated against each question.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

Q.1 Answer the following questions in one line. [10×1=10]

(a) What is real time system?

(b) What is meant by context switch?

(c) What is cooperative process?

(d) What is the use of Inter Process Communication?

(e) When does thrashing occurs?

(f) What is system program?

(g) What is preemptive multitasking?

(h) State the advantages of multiprocessor system?

(i) What is virtual memory?

(j) What is semaphore?

Q.2 Answer each part in 50 words: [5×3=15]

(a) What are the activities of the operating system with regard to process management?

(b) What are the mechanisms to prevent occurrence of deadlock?

(c) Explain directory implementation in operating system.

(d) Write a short note on Process Control Block (PCB).

(e) Write a short note on system calls.

Q.3 Answer each part in maximum 150 words: [4×5=20]

(a) What questions arise about revocation of access rights? Discuss schemes to implement revocation of access rights.

(b) Explain LRU page replacement algorithm with an example reference string as given below –

7	0	1	2	0	3	0	4	2	3	0	3	2	1	2	0	1	7	0	1

Consider the page frame size as three.

(c) With the help of diagrams, explain the concept of demand paging and demand segmentation?

(d) List all types of program threats in operating system. Explain each briefly with suitable example.

Q.4 (a) Explain the FCFS and Round Robin (time slice = 2) scheduling algorithm with Gantt chart for the four processes given below. Compare their average turnaround and waiting time. [10]

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

(b) Explain Banker's algorithm and its use in deadlock avoidance using a suitable example. [10]

Q.5 (a) Why thread is called a light weight process? Differentiate between a process and a thread. [8]

(b) What is the difference between security policy and security model? Explain the access matrix model. [7]

OR

Q.5 What is understood by logical and physical address space? Why Translation Look-aside Buffers (TLB) are important in paging. Explain with example. [15]

14804

Roll No. _____ Total No of Pages: 2

14804

MCA I - Sem. (Main) Exam., Dec. - 2018

MCA – 104 Computer Architecture

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 32

Instructions to Candidates:

*Attempt **all questions,** Marks of question are indicated against each question.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

Q.1 Answer the following in 1-2 lines: [10×1=10]

(a) What is don't care condition?

(b) What are the limitations of D flip-flops.

(c) Differentiate Registers and Counters.

(d) What do you understand by DMA.

(e) What is multiprocessing?

(f) Differentiate distributed and multi computing.

(g) What is assembler?

(h) Difference between RAM and ROM.

(i) Define page hit ratio.

(j) Convert the following member-

$(56.225)_{10} = (?)_2$

Q.2 Answer the following questions in 50 words: [5×3=15]

(a) Define Von-Neumann computers with block diagram.

(b) Differentiate linking and loading.

(c) Explain the construction of 2×1 multiplexer by the logical diagram.

(d) Simplify the following Boolean function in sum of products form.

$F(A, B, C, D) = \Sigma (0, 1, 2, 5, 8, 9, 10)$

(e) Write advantages of shared memory.

Q.3 Answer the following questions in 150 words each- [4×5=20]

(a) Difference between RISC and CISC.

(b) Explain Auxiliary, Associative and Virtual memory.

(c) What do you mean by handshaking? Explain with block diagram.

(d) What is hit ratio? Calculate an average access time in a system if cache access time is 100 ns, main memory access time is 1000 ns and a hit ratio is 0.6.

Q.4 (a) Explain half and full adder with its logic and block diagrams and truth table. [10]

(b) What are the different modes of transfer. Explain with suitable example? [10]

Q.5 Attempt any one of two: [15]

(a) Explain briefly pin diagram, architecture, addressing mode and instruction set of 8085.

OR

(b) What do you understand by page fault? Explain page replacement techniques. [15]

14805

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14805

MCA I - Sem. (Main) Exam., Dec. - 2018

MCA – 105 Accounting and Financial Management

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 32

Instructions to Candidates:

*Attempt **all questions,** Marks of question are indicated against each question.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

Q.1 Answer the following questions in one line: [10×1=10]

(a) What is Accounting Equation?

(b) What is the purpose for preparing Trail Balance?

(c) What do you mean by Marshalling of Assets?

(d) What is Balance Sheet?

(e) What is Acid – test Ratio?

(f) What is the formula of Debtor Turnover Ratio?

(g) Define Contribution.

(h) Mention any one purpose of Cost Accounting.

(i) What do you mean by Present Value?

(j) What do you know about Profit Maximization Objectives?

Q.2 Answer each part in maximum 50 words: [5×3=15]

(a) What do you know about Double Entry Accounting System?

(b) What do you understand by Final Accounts? What are its purpose?

(c) What are the limitations of Accounting Ratios?

(d) What is Marginal Costing? What are its purpose?

(e) How wealth maximization objective is superior then profit maximization objective? Mention any two.

Q.3 Answer each part in maximum 150 words: [5×4=20]

(a) What is accounting? What are its scope?

(b) How treatment of adjustment for 'outstanding expenses', 'accrued income', 'unearned income' and 'closing stock' is made?

(c) What is 'Creditor Turnover Ratio' and 'Operating Ratio'? How these ratios are helpful in business decision making?

(d) What is the definition of Cost Accounting? What are its advantages?

(e) What are the functions of Financial Management? Explain.

Q.4 Short notes:

(a) Different methods for preparing Trial Balance with imaginary data. [10]

(b) Different branches of accounting. [10]

Q.5 Roshi Corporation Ltd. has prepared the following budget estimates for the year 2017-18. [15]

Sales Units	15,000
Fixed Expenses	₹ 34,000
Sales value	₹ 1,50,000
Variable Costs	₹ 6 per unit

You are required to:

(i) Find the P/V ratio; break-even point and margin of safety.

(ii) Calculate the revised P/V ratio, break – even point and margin of safety in each of the following cases:

(a) Decrease of 10% in selling price;

(b) Increase of 10% variable costs;

(c) Increase of sales volume by 2000 units;

(d) Increase of ₹ 6,000 in fixed costs.

OR

Prepare Trading Account, Profit and Loss Account and Balance Sheet for the year ending on 31st March 2018 from the following balances; [15]

Particulars	Amount (in Rupees)
Capital	1,00,000
Drawings	17,600
Purchases	80,000
Sales	1,40,370
Purchases Returns	2,820
Stock (1- 4 - 2017)	11,460
Bad Debts	1,400
Bad Debts Reserve (1 – 4 - 2017)	3,240
Rates & Insurance	1,300
Discount received	190
Bills Receivable	1,240
Sales Returns	4,240
Wages	6,280
Buildings	25,000
Rent Received	2,100
Railway freight and other expenses on goods sold	16,940
Carriage Inwards	2,310
Office Expenses	1,340
Printing & Stationary	660
Postage & Telegrams	820
Sundry Debtors	62,070
Sundry Creditors	18,920
Cash at Bank	12,400
Cash in hand	2,210
Office Furniture	3,500
Salary & Commission	9,870
Addition to Building	7,000
