

**SECOND SEMESTER M.C.A. DEGREE (SPECIAL) [SUPPLEMENTARY]
EXAMINATION, SEPTEMBER 2017**

M.C.A.

(2000 Syllabus Year)

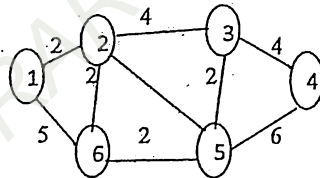
MCA 2K 202—GRAPH THEORY AND COMBINATORICS

Time : Three Hours

Maximum : 100 Marks

*Answer any five questions.
All questions carry equal marks.*

1. (a) Define the adjacency matrix, incidence matrix with suitable examples.
(b) Prove : If B is a circuit matrix of a connected graph G with e edges and n vertices, rank of $B = e - n + 1$.
2. (a) Explain the PRIM'S algorithm to find an optimal tree in a connected weighted graph.
(b) Prove : Every connected graph has atleast one spanning tree.
3. (a) Prove : if $n \neq 1$ is a positive odd integer, then the complete graph K_n contains $\frac{(n-1)}{2}$ edge-disjoint Hamiltonian cycles.
(b) Prove : Any connected graph with n vertices and $(n - 1)$ edges is a tree.
4. (a) Apply Dijkstra's algorithm to the weighted graph shown below to find the minimum distance.



- (b) Prove : Let T be a full binary tree with n vertices. Then the number of leaves in T is $\frac{(n+1)}{2}$.
5. (a) How many positive integers less than 10,00,000 have the sum of their digits equals to 19 ?
(b) State and prove the principle of inclusion-exclusion .

Turn over

6. (a) Prove : Let $A = \{a_1, a_2, a_3, \dots, a_n\}$ be a finite set with n elements, $n \geq 2$. There are $(n!/2)$ even permutations and $(n!/2)$ odd permutations.

(b) Find the co-efficient of x^6 in the expansion of $\left(ax^2 + \frac{1}{bx^2}\right)^{11}$.

7. (a) If $P(k) - 6P(k-1) + 5P(k-2) = 0$; $P(0) = 2, P(1) = 2$. What is the generating function of P ?

(b) Write the recurrence relation for Fibonacci numbers and solve it.

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. (SPECIAL) SUPPLEMENTARY DEGREE
EXAMINATION, SEPTEMBER 2017**

MCA 2K 201—NUMBER THEORY AND CRYPTOGRAPHY

(2000 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (a) Prove that if a prime p does not divide a , then $\gcd(p, a) = 1$. (6 marks)
(b) State Fermat Theorem. Test whether 97 is Prime or not by applying Fermat test. (7 marks)
(c) Let m be a positive integer. If $a \equiv b \pmod{m}$ and $c \equiv d \pmod{m}$, then prove that $ac \equiv bd \pmod{m}$. (7 marks)
2. (a) Find the remainder of $97!$ when divided by 101. (8 marks)
(b) Find all quadratic residues modulo 11. Also show that number of quadratic residues and non-residues are exactly equal to $(p-1)/2$. (8 marks)
(c) Solve $15X + 27Y = 1$. (4 marks)
3. (a) Apply Naive algorithm to test whether 29 is prime. (6 marks)
(b) Define Modular Arithmetic. Explain the role of modular arithmetic in Cryptography. (7 marks)
(c) Briefly explain identified cryptanalysis in DES. (7 marks)
4. (a) With a neat sketch, explain Cipher Feedback Mode. (10 marks)
(b) Write a note on Steganography. Compare Steganography with Cryptography. (10 marks)
5. (a) Define Elliptic Curve. Generate all points on the Elliptic curve $E_{11}(1, 6)$. (10 marks)
(b) What are one way trap functions ? What is their importance in cryptography ? (10 marks)

6. (a) Give an overview of IDEA. (7 marks)

(b) Generate an 8 bit random number for polynomial function :

$$x_{n+1} = 3x_n + 5 \pmod{31} \quad n \geq 1, \text{ and } x_0 = 2.$$

(6 marks)

(c) Briefly explain the methods for secure secret key exchange. (7 marks)

7. (a) Explain SHA - 512. (10 marks)

(b) Explain Digital Signature Scheme with confidentiality, Integrity and Authentication. (10 marks)

[5 × 20 = 100 marks]

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**SECOND SEMESTER M.C.A. DEGREE [SUPPLEMENTARY]
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 18 205—JAVA PROGRAMMING

(2018 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer five full questions.
Each question carries 20 marks.*

1. What is an Array ? How arrays are handled in classes ? Explain with an example to sort a list of elements.
2. What are Interfaces ? How it is different from packages ? Explain the use of interfaces in inheritance with an example.
3. What do you mean by event handling ? Explain.
4. What is Multiple Inheritance ? Explain diagrammatically ? What is the ambiguity involved in multiple inheritance ? How is it solved ?
5. Write a program in Java, which will read a text and count all occurrences of a particular word.
6. What is Multi-threading ? How is multithreading different from multi-tasking ? Write a class Point, which has two data members X and Y. Write a constructor for initializing these and a method for displaying the points. Using this class, create point objects. Also demonstrate the use of threads with these objects by displaying the points after every 2 seconds, one after another.
7. What are the various looping statements available in Java ? Discuss with suitable examples.

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. DEGREE [SUPPLEMENTARY]
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 18 204—COMPUTER NETWORKS

(2018 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer five full questions.

Each question carries 20 marks.

1. Explain OSI layers and TCP/IP layer ? Compare and contrast OSI layers and TCP/IP layer.
2. Briefly explain the key communication components in network evolution.
3. Explain error detection and correction methods.
4. Briefly explain multicast routing.
5. Explain in detail :
 - (a) ICMP ;
 - (b) IGMP ; and
 - (c) ARP.
6. Explain in details the functionalities of transport layer in detail ?
7. Define all guided transmission media with its application.

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY)
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 18 203—DATA STRUCTURES

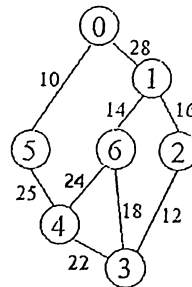
(2018 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer five full questions.
Each question carries 20 marks.*

1. (a) Define space complexity of an algorithm with examples. (10 marks)
(b) Explain in detail about representation of multidimensional arrays in memory. (10 marks)
2. (a) What are circular queues ? Write algorithm for insertion and deletion of elements from a circular queue. (10 marks)
(b) Write an algorithm to implement polynomial addition. Use linked list representation of polynomials. (10 marks)
3. (a) What is a Huffman tree ? Explain the steps for construction of a Huffman tree with an example. (10 marks)
(b) What is a binary tree? How post order traversal is done in a binary tree ? Explain with an example. (10 marks)
4. (a) With suitable examples list the steps for deletion of a node from a binary search tree. (10 marks)
(b) Write notes on AVL trees. (10 marks)
5. (a) What is a minimum spanning tree ? Write Prim's algorithm to find minimum spanning tree. Find the minimum spanning tree of the below given graph using Prim's algorithm. (10 marks)



(10 marks)

Turn over

- (b) Explain with an example the concept of Quadratic probing. (10 marks)
6. (a) With an example explain the steps in Quick sort. (10 marks)
- (b) Explain the concept of binary search with an example. (10 marks)
7. (a) Write notes on Shell Sorting. (5 marks)
- (b) Sort the list given below using insertion sorting (show each step). What is the complexity of insertion sort. List the advantages of insertion sorting.

A = {39, 9, 45, 63, 18, 81, 108, 54, 72, 36}.

(15 marks)

[5 × 20 = 100 marks]

**SECOND SEMESTER M.C.A. DEGREE [SUPPLEMENTARY]
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 18 202—COMPUTER ORGANIZATION AND ARCHITECTURE

(2018 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer full five questions.
Each question carries 20 marks.*

1. I Explain the various generations of Computer.
II Explain Software interface.
2. I Write in detail about various addressing modes.
II Explain the floating point addition and subtraction.
3. I Explain in detail about nano-programming.
II Explain the concept of hardwired control unit.
4. I Define the Static RAM (SRAM). Explain the working of SRAM cell with a neat diagram.
II Illustrate the characteristics of some common memory technologies.
5. I Describe the data transfer method using DMA.
II Explain the working of PCI interface.
6. I Explain the multiple bus organization in detail.
II Explain pipeline processing with example.
7. Explain in detail about the following :
 - a) Influence on instruction set.
 - b) Data path considerations.

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2021**

M.C.A.

MCA 18 201—OPERATING SYSTEM

(2018 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer full five questions.
Each question carries 20 marks.*

1. Describe about the process attributes and process states in an Operating system in detail.
(20 marks)
2. What is a monitor ? Explain how monitors used to solve dining philosopher's problem.
(5 + 15 = 20 marks)
3. With a neat sketch explain Paging.
(20 marks)
4. Using FIFO,OPT and LRU page replacement algorithms, find out the number of page faults for the reference string 3, 1, 4, 6, 1, 0, 5, 4, 3, 5, 0, 1, 6 by considering initially the number of available free frames as four and suggest the best replacement algorithm among the three. Further explain Belady's anomaly.
(15 + 5 = 20 marks)
5. What is process synchronization in OS ? Explain with Critical Section Problem and solutions to critical section problem.
(20 marks)
6. What are the major activities of an operating system with regard to file management ? Explain them briefly with their supporting system calls.
(20 marks)
7. Explain the domain and goals of protection.
(20 marks)

SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY)
EXAMINATION, DECEMBER 2021

M.C.A.

MCA 10 205—DATA STRUCTURES

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five questions.
Each full question carries 20 marks.*

1. (a) Write a recursive algorithm to find the n^{th} term of the fibonacci series. Use it to generate the first m terms of the series.
(10 marks)
- (b) What are Time Complexity and Space Complexity of an algorithm ? How are these parameters calculated for a given algorithm ? Illustrate with suitable examples.
(10 marks)
2. (a) What is Big Oh notation. Prove that $1 + 2 + 3 + \dots + n = O(n^2)$
(10 marks)
- (b) Define the Stack data structure. Explain how it can be implemented using arrays.
(10 marks)
3. What are Queues ? Explain how queues can be implemented via arrays and linked lists ?
Express the time complexity of the queue operations in each implementation in Big Oh notation.
(20 marks)
4. (a) What are binary trees ? How are such trees implemented using Linked List ? Explain.
(10 marks)
- (b) What are directed graphs ? How are such graphs implemented using arrays and linked lists ?
Explain with the help of examples. (10 marks)

Turn over

5. (a) How the union, intersection, difference and Complementation operations of sets can be implemented using bit strings ? Explain.
(10 marks)
- (b) Write the sequential search algorithm to search whether a given key elements is present in a given array or not.
(10 marks)
6. (a) What are Binary Search Trees ? Explain how searching a given key element can be done in a binary search trees.
(10 marks)
- (b) What is Hashing ? Explain any *three* hashing functions in detail.
(10 marks)
7. (a) Explain the Insertion Sort algorithm with an illustrative example.
(10 marks)
- (b) Explain the Quick Sort algorithm with an illustrative example.
(10 marks)

[5 × 20 = 100 marks]

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2021**

M.C.A.

MCA 10 204—OPERATING SYSTEMS

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

1. Explain the different functions of an Operating System in detail. (20 marks)
2. (a) What is meant by Buffering ? Explain the Double Buffering technique in detail. (10 marks)
(b) What are deadlocks ? What are the necessary conditions for deadlock to occur in an OS ? Explain. (10 marks)
3. (a) Explain how semaphores can be used to implement Process Synchronisation. (10 marks)
(b) Explain the Banker's algorithm for deadlock avoidance in detail. (10 marks)
4. (a) What is meant by Page replacement ? Explain the following Page replacement algorithms in detail. (12 marks)
 - (i) FIFO Replacement algorithm.
 - (ii) LFU Replacement algorithm.
 - (iii) LRU Replacement algorithm.
- (b) Distinguish between Internal Fragmentation and External Fragmentation. (8 marks)
5. (a) Differentiate between Paging and Segmentation. (10 marks)
(b) Explain the different File Access methods. (10 marks)
6. (a) Explain the implementation of a 2- level directory. (10 marks)
(b) Write notes on the following file organisation methods. (10 marks)
 - (i) Random Access File.
 - (ii) Indexed Sequential File.
7. (a) Explain how Access Matrix can be used to implement protection state. (10 marks)
(b) Give a note on the UNIX File protection mechanisms. (10 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY)
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 10 203—DATABASE MANAGEMENT SYSTEMS

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each full question carries 20 marks.

1. Explain the architecture of a typical Database Management System.
(20 marks)

2. (a) Write short notes on :
 - (i) Strong Entities and Weak Entities.
 - (ii) Specialisation and Aggregation.(12 marks)

- (b) Explain the different hashing techniques.
(8 marks)

3. What do you mean by Multilevel Indexing ? What are its advantages over single level indexing ?
With illustrative example, explain how multilevel indexing works.
(20 marks)

4. (a) What is meant by Normalisation ? Why is it essential in designing database for various real time applications ?
(8 marks)

- (b) Write short notes on :
 - (i) Functional Dependency ;
 - (ii) Multivalued Dependency ; and
 - (iii) Join Dependency.(12 marks)

Turn over

5. (a) Explain the First, Second and the Third Normal Forms with illustrative examples.
(10 marks)
- (b) What are Transactions ? Explain the desirable properties of Transactions.
(10 marks)
6. What is meant by Concurrency Control ? Explain the different locking techniques for concurrency control in detail.
(20 marks)
7. (a) Explain the Shadow Paging Technique in detail.
(10 marks)
- (b) Write a note on the ARIES recovery algorithm.
(10 marks)

**SECOND SEMESTER M.C.A. DEGREE [SUPPLEMENTARY]
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 10 202—COMPUTER ORGANIZATION

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer full five questions.
Each question carries 20 marks.*

1. (a) Explain the organisation of a digital computer specifying the classic components.
(15 marks)
- (b) Write note on MIPS.
(5 marks)
2. (a) What are the different types of operands in typical machine instructions. Give examples.
(12 marks)
- (b) Explain how instructions are represented in Digital Computers.
(8 marks)
3. (a) Explain the Multiplication Hardware, giving the multiplication algorithm.
(10 marks)
- (b) Explain the different schemes for representing floating point numbers.
(10 marks)
4. What is Multicycle implementation ? What are its advantages over Single Cycle implementation ?
Explain a multicycle data path for MIPS to handle basic instructions.
(20 marks)

Turn over

5. (a) Explain the following types of mapping techniques with respect to cache memory :

- (i) Direct Mapping ;
- (ii) Associative Mapping ; and
- (iii) Set Associative Mapping ;

(15 marks)

(b) Distinguish between Temporal Locality and Spatial Locality.

(5 marks)

6. (a) What is Page Fault ? Explain the actions taken when a page fault occurs.

(15 marks)

(b) Write notes on TLB.

(5 marks)

7. (a) Write notes on :

- (i) MTTF ;
- (ii) MTTR ;
- (iii) AFR ; and
- (iv) MTBF ;

(12 marks)

(b) What do you mean by Bus ? Explain the terms Processor-Memory Bus, I/O Bus and Backplane bus in detail.

(8 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY)
EXAMINATION, DECEMBER 2021**

M.C.A.

MCA 10 201—GRAPH THEORY AND COMBINATORICS

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five full questions.
Each full question carries 20 marks.*

1. (a) Let $G = (V, E)$ be a connected planar graph and F be the set of regions formed by a planar embedding of G . Then show that $|V| - |E| + |F| = 2$.
(15 marks)
- (b) Let G be a loopfree undirected graph with n vertices. If G has 56 edges and the complementary graph \bar{G} has 80 edges, what is the value of n ?
(5 marks)
2. (a) Describe how rooted trees can be used to represent Arithmetic Expressions. (10 marks)
- (b) Using Huffman's algorithm, construct an optimal prefix code for the symbols a, o, q, u, y and z that occur in a given sample with frequencies 20, 28, 4, 17, 12 and 7 respectively.
(10 marks)
3. What do you mean by the term Minimum Cost Spanning Tree? Explain the Kruskal's algorithm to compute the minimum cost spanning tree of an undirected connected graph. Use it to find the minimum cost spanning tree for the graph shown in figure 1.

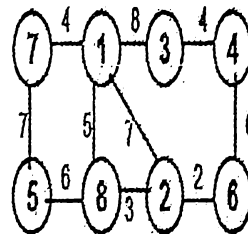


Figure 1

(20 marks)

Turn over

4. State and prove the Hall's Theorem for Complete Matching in Bipartite Graphs. Use it to prove that the graph shown in Figure 2 does not have a complete matching.

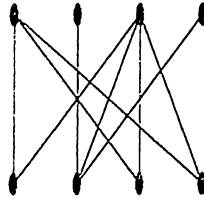


Figure 2

(20 marks)

5. (a) State and prove Binomial Theorem. (10 marks)
- (b) A message is made up of 12 different symbols and is to be transmitted through a communication channel. In addition to the 12 symbols, the transmitter will also send total of 45 blank spaces between these symbols, with at least 3 spaces between each pair of consecutive symbols. In how many ways, can the transmitter send such a message ?

(10 marks)

6. (a) Determine the number of integers n where $1 \leq n \leq 100$ and n is not divisible by 2, 3 or 5. (10 marks)
- (b) In how many ways, can a police captain distribute 24 rifle shells to 4 police officers so that each officer gets at least 3 shells but not more than 8. (10 marks)
7. (a) Solve the Recurrence Relation $a_n - 4a_{n-1} + 3a_{n-2} = 0$ subject to the conditions $a_0 = 1$ and $a_1 = 2$. (10 marks)
- (b) Using Generating Functions, solve the Recurrence Relation $a_k = 3a_{k-1}$ subject to the condition $a_0 = 2$. (10 marks)

(10 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 205E—SOFTWARE TESTING AND QUALITY ASSURANCE

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five full questions.
Each question carries 20 marks.*

1. (A) Define Software Quality ? Discuss about the Software Quality Triangle.
(B) Elaborate on Prototyping model with a neat diagram and explain its various stages in detail.
2. (A) What is the importance of having a Testing approach ? Explain the Testing approaches in detail.
(B) Write short notes on the following :
 - (i) White Box Testing ; and
 - (ii) Black Box Testing.
3. (A) What do you mean by Alpha Testing ? Elaborate on the various aspects that are addressed during Alpha Testing.
(B) Write short notes on the following software Testing Tools :
 - (i) Win Runner ; and
 - (ii) Silk Test.
4. (A) Write short notes on :
 - (i) Product Quality.
 - (ii) Process Quality.
(B) Define Software Metrics ? Describe the various metrics that you are aware with example.
5. (A) What do you mean by process improvement model ? Explain any two models that you know.
(B) What do you understand by CMM Level 4 companies ? Explain the various types of CMMs that are available.

Turn over

6. (A) What is the importance of having a Test Plan Format? Explain in detail with an example.
- (B) Write short notes on:
- (i) Equivalence class partitioning.
 - (ii) Boundary value analysis.
7. (A) “*Testing is the process to prove that the software works correctly*”. Validate the above statement in detail.
- (B) Narrate the importance of Verification and validation as part of the process of Testing ?

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 205 D—CLOUD COMPUTING

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (a) Describe layers and types of clouds available in Cloud Computing. (10 marks)
(b) Explain desired features in cloud computing and its significance with the current technology. (10 marks)
2. (a) Illustrate the SaaS integration ENIGMA with its constraints and implementation limitations. (10 marks)
(b) Explain Cloud supply chain process comparing with traditional and emerging ICT supply. (10 marks)
3. (a) With a diagram explain Image Management VMs in open nebula. (10 marks)
(b) Explain CaaS Service Design with its cluster attributes. (10 marks)
4. (a) Describe Aneka platform-as-a-service (PaaS) offered for enterprise cloud. (10 marks)
(b) Explain SAGA MapReduce framework architecture for cloud environment. (10 marks)
5. (a) Compare and contrast between “Classical” HPC and HPC in Cloud Environments.
(b) Describe and compare Aneka and Comet Cloud Models. (10 + 10 = 20 marks)

6. (a) Describe challenges faced in implementation of the cloud computing services. (10 marks)
- (b) Explain enterprise cloud technology and its market evolution significance. (10 marks)
7. (a) Illustrating cloud computing principle explain data processing procedure used in AWS.
- (b) Explain load balancing and admission control approaches in SLO management used for cloud computing services.

(10 + 10 = 20 marks)

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**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 205 C—MOBILE COMPUTING

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (a) Give an account on cellular architecture in detail. (10 marks)
(b) Explain the characteristics of mobile computing. (10 marks)
2. (a) Describe the various channel allocation schemes in mobile networks. (10 marks)
(b) Compare and contrast TDM and CDM. (10 marks)
3. (a) Discuss about different location management schemes in GSM. (10 marks)
(b) Explain the working of mobile IP and its topology with suitable diagram. (10 marks)
4. (a) Discuss the various mobile payment schemes with its security issues. (10 marks)
(b) Compare and contrast IPv4 and IPv6. (10 marks)
5. (a) Explain the working of wireless sensor network. (10 marks)
(b) Give a detailed account on sensor network routing protocols. (10 marks)
6. (a) What is UMTS ? Describe the function of HLR and VLR in call routing and roaming.
(b) Discuss the challenges and issues in implementing MANETs.
(10 + 10 = 20 marks)
7. (a) Discuss the salient features of J2ME for developing mobile computing applications.
(b) Explain the different types of mobility in mobile computing.
(c) Write a note on hidden terminal problem in Wireless LAN.
(10 + 5 + 5 marks)

SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021

M.C.A.

MCA 20 205 B—ANDROID APPLICATION PROGRAMMING

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (a) Briefly explain the application services which are the architectural cornerstones of all Android applications. (10 marks)
- (b) (i) Write a brief note on features of Android. (6 marks)
- (ii) Mention any four Android devices. (4 marks)
2. (a) (i) How do you configure Android SDK Manager ? (6 marks)
- (ii) What are Fragments and Intents ? (4 marks)
- (b) How do you link Activities with Intents ? Briefly explain the steps involved in this process. (10 marks)
3. (a) Discuss about *Linear Layout, Absolute Layout, Table Layout* and *Frame Layout*. (10 marks)
- (b) How do you create the user interface programmatically ? Explain the steps with appropriate code. (10 marks)
4. (a) Explain any five basic views that can use in the design of UI. (10 marks)
- (b) Explain *Time Picker View* and *Date Picker View* ? Also show the steps and code to use *TimePicker View* in Android application. (10 marks)

Turn over

5. (a) How do you retrieve and modify Preferences ? Demonstrate it with the help of sample code. (10 marks)
- (b) (i) With the help of code demonstrate the way of adding contacts to a Table. (6 marks)
- (ii) Explain the various parts of URI that is used to query a content provider. (4 marks)
6. (a) Write sample code to illustrate the way of sending SMS messages. (10 marks)
- (b) (i) What are the five arguments used in *sendTextMessage ()* method ? (5 marks)
- (ii) Explain the process of receiving SMS Messages. (5 marks)
7. (a) Create an Android project for HTTP connection and to download all sorts of content.
- (b) (i) Write a note Socket Programming and its purpose.
- (ii) What is Threading ? Explain.

(10 + 5 + 5 = 20 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 205 A—INFORMATION RETRIEVAL

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (a) Differentiate between Information Retrieval and Data Retrieval. (10 marks)
(b) Explain single Link algorithm in detail. (10 marks)
2. (a) Discuss the Boolean model of Information Retrieval in detail. (10 marks)
(b) Write a short note on different search strategies in Information Retrieval systems. (10 marks)
3. (a) Compare Precision and Recall with the help of suitable examples. (10 marks)
(b) What is online IR System ? Explain its characteristics along with merits. (10 marks)
4. (a) What is Ontology ? Discuss Ontology life cycle. (10 marks)
(b) Compare distributed and parallel IR systems. (10 marks)
5. (a) What is Multimedia IR ? Explain the different techniques to represent audio and visual documents ? (10 marks)
(b) Explain generic multimedia indexing approach. (10 marks)
6. (a) What is meant by multimedia data ? Explain how it is effectively represented. (10 marks)
(b) Explain the process of Information Retrieval with suitable block diagram. (10 marks)
7. (a) What is signature file ? Explain its characteristics. (10 marks)
(b) Explain digital libraries. Discuss its architecture issues. (10 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 204—SOFTWARE ENGINEERING.

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five full questions.
Each question carries 20 marks.*

1. (A) Define Software Engineering. How do you explain the importance of Software Engineering ?
(B) Explain a waterfall model with a diagram. Why does this model sometimes fail ?
2. (A) What are the different types of requirements in Software Engineering ? Explain any two.
(B) Differentiate Context oriented and flow-oriented models with an example each.
3. (A) Discuss about object-oriented concept in Software Engineering.
(B) Describe component level design. Explain the steps involved in it.
4. (A) Briefly describe SQA and its activities. What are its advantages and disadvantages ?
(B) Discuss white box testing method with one of its techniques.
5. (A) What is Software Project Management ? How do you explain the need of the same ?
(B) Explain the factors affecting software cost estimation.
6. (A) Compare Agile development model with Scrum Framework. Mention the similarities and differences in both the models.
(B) What are deployment diagrams ? Explain the purpose of using these diagrams
7. (A) What are the functional and non-functional testing ? Explain each one
(B) What are the three software metrics ? Explain.

(5 × 20 = 100 marks)

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 203—WEB PROGRAMMING WITH PHYTHON

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five full questions.
Each question carries 20 marks.*

1. (A) Write the CSS rules for controlling the positions of elements in XHTML document. (10 marks)
- (B) Write and explain the HTML tag to create password field with its attributes. (5 marks)
- (C) Differentiate between HTML and DHTML. (5 marks)
2. (A) Explain the syntax and function of any two control flow structures in PHP with examples. (10 marks)
- (B) Write a PHP script to accept the name of any state from user and print the company name and all its branches in the state using the following relational tables :
Company (CNo, CName, Region, State) and Branch (Bcode, Bname, City, CNo,) (10 marks)
3. (A) Give an account on standard data type in python with illustration. (8 marks)
- (B) Explain the syntax and function of *try..finally* block in Python with example. (8 marks)
- (C) Differentiate between mutable and immutable objects in Python. (4 marks)
4. (A) Explain how exceptions are handled in Python using examples. (10 marks)
- (B) Explain the concept of class and object in python. Also describe the way of creating objects in python using class with an example. (10 marks)
5. (A) Give a detailed account on Python SQLite3 module API. (10 marks)
- (B) Explain the steps for creating table in SQLite using Python. Also write the query for inserting tuple into the table. (10 marks)

Turn over

6. (A) What is content management system? Explain any two content management systems written in PHP. (10 marks)
- (B) What are the different types of constructors in Python? Explain each one with illustration. (10 marks)
7. (A) Discuss the role of Forms and Frames in HTML with examples. (10 marks)
- (B) Write a Python program to store N numbers in a list and sort the list in ascending order. (6 marks)
- (C) What are dictionaries ? Explain how it is created using Python. (4 marks)

[5 × 20 = 100 marks]

**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
APRIL 2021**

M.C.A.

MCA 20 202—MACHINE LEARNING

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

*Answer any five full questions.
Each question carries 20 marks.*

1. (A) Explain the different types of machine learning approaches with examples. (16 marks)
(B) What is inductive learning hypothesis in Machine Learning ? (4 marks)
2. (A) Explain the concept of a decision tree with the help of an example.
(B) Give an account on model selection and generalization in Machine Learning.
(C) What are features in Machine Learning ? Explain its importance.
(8 + 6 + 6 = 20 marks)
3. (A) Explain the concept of expectation maximization with the help of an algorithm.
(B) Explain the types of hierarchical clustering. (10 + 10 = 20 marks)
4. (A) Explain the working principle of back propagation neural networks with neat architecture diagram.
(10 marks)
(B) What is activation function ? Explain the different activation functions used in Artificial Neural Network.
(10 marks)
5. (A) Explain the architecture and working of Convolution Neural Network (CNN)
(B) What is LSTM ? Explain how it differs from RNN.
(12 + 8 = 20 marks)

Turn over

6. (A) Discuss Linear Discriminate Analysis algorithm with neat sketch. (12 marks)
(B) Compare and contrast biological and artificial neural neuron. (8 marks)
7. (A) Explain the Principal Component Analysis for dimension reduction (10 marks)
(B) Give an account on sequence modeling using Recurrent Nets. (10 marks)

[5 × 20 = 100 marks]

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**SECOND SEMESTER M.C.A. DEGREE (SUPPLEMENTARY)
EXAMINATION, APRIL 2021**

M.C.A.

MCA 20 201—COMPUTER ARCHITECTURE

(2020 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five full questions.

Each question carries 20 marks.

1. (A) Give any *four* parallel processing applications. (10 marks)
(B) Distinguish between :
 - (i) Uniprocessor systems versus multiprocessor systems. (5 marks)
 - (ii) Parallelism versus pipelining. (5 marks)
2. (A) With a neat sketch explain in detail about vector processing and its architecture.
(B) Compare the advantages and disadvantages of the three interleaved memory organizations for pipelined vector accessing.

(10 + 10 = 20 marks)
3. (A) Explain how matrix multiplication is performed in SIMD computer. (10 marks)
(B) Explain the practical issues to be considered for interconnection networks. (10 marks)
4. (A) Explain the different types of multiprocessor operating systems. (10 marks)
(B) Explain the distributed shared memory architecture in detail. (10 marks)
5. (A) Explain any *one* partitioned matrix algorithm implemented using VLSI technology.
(B) Compare data flow and control flow computers.

(10 + 10 = 20 marks)
6. (A) Distinguish between array computers and pipeline computers. (10 marks)
(B) Explain the principles of designing pipelined processors. (10 marks)
7. (A) Write a note on Interconnected networks. (10 marks)
(B) Explain the working vector supercomputers. (10 marks)

[5 × 20 = 100 marks]