

**FIFTH SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2020**

M.C.A.

MCA 10 505 (A)—DATA MINING AND DATA WAREHOUSING

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) What do you mean by Data Mining ? Explain the architecture of a typical data mining system. (10 marks)
- (b) Write brief notes on :
 - (i) Characterization and Discrimination.
 - (ii) Classification and Prediction.
 - (iii) Cluster Analysis.
 - (iv) Outlier Analysis.(10 marks)
2. (a) What do you mean by Data Warehousing ? Explain the three tier data warehouse architecture in detail. (10 marks)
- (b) What is meant by Data Cleaning ? What are the different methods for Data Cleaning ? Explain. (10 marks)
3. (a) Explain the following coupling schemas for integrating a data mining system with a DB/DW system.
 - (i) No Coupling. (ii) Loose Coupling.
 - (iii) Semitight Coupling. (iv) Tight Coupling.(10 marks)
- (b) Explain the importance of establishing a standardized Data Mining Query Language. What are the benefits and challenges involved in this task ? (10 marks)
4. What is meant by Data Generalisation ? Explain how the same can be done by means of Attribute Oriented Induction. (20 marks)

Turn over

5. (a) What is Classification ? Explain the steps involved in Classification. (8 marks)
- (b) Give detailed notes on the following types of classification.
- (i) Decision Trees. (ii) Bayesian Classification. (12 marks)
6. (a) Write notes on the following classification methods :
- (i) k-nearest neighbour classification
- (ii) Genetic Algorithms.
- (iii) Rough Set Approach. (12 marks)
- (b) What is meant by Clustering ? What are the requirements of Clustering in Data Mining ? Explain. (8 marks)
7. (a) What is meant by Data Warehouse ? What are the key features of a data warehouse ? Explain. (8 marks)
- (b) What is meant by OLAP and OTAP ? Explain the distinguishing features between OLTP and OLAP in detail. (12 marks)
- [5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2020**

M.C.A.

MCA 10 504.B—COMPUTER ARCHITECTURE

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

Answer any five questions.

Each full question carries 20 marks.

1. (a) Explain the Flynn's classification in detail. (10 marks)
(b) What do you mean by the term Instruction Format ? Explain the different instruction formats in detail. (10 marks)
2. (a) Describe the quantitative principles of Computer Design. (10 marks)
(b) What do you mean by Pipelining ? What are its benefits ? Explain how the same is implemented in DLX. (10 marks)
3. (a) Describe the different hazards in pipelining. (10 marks)
(b) With suitable illustrative examples, explain a pipeline with multicycle operations. (10 marks)
4. (a) What do you mean by Instruction level parallelism ? How does it differ from data level parallelism and thread level parallelism ? Explain the different challenges in implementing Instruction Level Parallelism. (14 marks)
(b) Give brief notes on Vector Length and Stride. (6 marks)
5. (a) Explain the concept of Virtual Memory. How does it differ from Cache Memory ? Explain how the virtual to physical address translation is done. (15 marks)
(b) Write notes on Cache Coherence problem. (5 marks)
6. (a) Explain the terms Writeback Cache and Write Through Cache. (8 marks)
(b) Explain the practical issues occurring in connecting several computers together. (12 marks)
7. (a) Compare and contrast between Centralised Shared Memory and Distributed Shared Memory architectures. (10 marks)
(b) Explain the different models of consistency. (10 marks)

[5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2020**

M.C.A.

MCA 10 504.A—ELECTRONIC COMMERCE

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

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

1. Explain the different Marketplace technologies in detail. (20 marks)
2. (a) Write notes on :
 - (i) Online Web Selling ; (ii) Virtual Malls. (10 marks)
 - (b) What do you mean by the terms *Passive Threats* and *Active Threats* ? Explain the different types of passive attacks and active attacks. (10 marks)
3. (a) Describe, how secure electronic message transmission can be done with public key encryption. (10 marks)
 - (b) Explain any five specific Intruder approaches to security threats in detail. (10 marks)
4. (a) What are E-Payment systems ? What are its key features ? Explain the different types of E-Payment systems in detail. (10 marks)
 - (b) Explain the action of E-Cash in detail. (10 marks)
5. (a) Explain the different risks involved in E-payment systems. (10 marks)
 - (b) Describe the different strategies for Marketing on Web. (10 marks)
6. What is *Supply Chain Management* ? What are the characteristic features of supply chain management ? Give a supply chain management model and explain its elements in detail. (20 marks)
7. (a) What is meant by *Web Auction* ? Explain the different methods for it. (10 marks)
 - (b) Give a detailed note on Planning and Managing E-Commerce projects. (10 marks)

[5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. (SUPPLEMENTARY) DEGREE EXAMINATION
DECEMBER 2020**

MCA

MCA 10 503—WIRELESS COMMUNICATION

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) What is meant by Multiplexing ? Explain the different Multiplexing techniques in typical signal transmission in detail. (15 marks)
- (b) Give a short note on CDMA. (5 marks)
2. (a) Explain the different problems in signal propagation and transmission. (10 marks)
- (b) Write a detailed note on Digital Video Broadcasting. (10 marks)
3. (a) Explain the GEO, LEO and MEO satellites highlighting the respective merits and demerits. (15 marks)
- (b) Write a short note on GSM. (5 marks)
4. (a) What is meant by *Mobile IP* ? What are its goals and requirements ? Explain. (10 marks)
- (b) What is *Indirect TCP* ? What are its advantages and disadvantages ? Explain. (10 marks)
5. (a) Explain the Dynamic Host Configuration Protocol in detail. (10 marks)
- (b) Compare the relative merits and demerits of Infrared transmission and radio transmission. (10 marks)
6. Explain the IEEE 802.11 Wireless LAN and Bluetooth Personal area networks in detail. (20 marks)
7. (a) What is WAP ? Explain the architecture of WAP in detail. (10 marks)
- (b) Give a detailed note on Wireless Datagram Protocol. (10 marks)

**FIFTH SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2020**

M.C.A.

MCA 10 502—COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Distinguish between Raster Scan Systems and Random Scan Systems. (5 marks)
- (b) Explain the Mid-point Circle Algorithm. Illustrate how the algorithm works by means showing the first 3 iterations of the algorithm for drawing a circle with center at the origin and radius 5. (15 marks)
2. (a) Explain the different 2-D Transformations in detail. For each transformation, give the corresponding transformation equation, in matrix form using homogeneous co-ordinates. (15 marks)
- (b) What are homogeneous Co-ordinates ? What is the need for such transformations ? (5 marks)
3. Explain the parallel projection and perspective projection in 3-D in detail. (20 marks)
4. (a) Explain the different properties of Multimedia Systems. (10 marks)
- (b) How MIDI differs from Digital Audio ? Explain. (10 marks)
5. (a) Give a detailed account different Multimedia Tools. (10 marks)
- (b) What is Computer Animation ? Explain the different steps in creating an animation. (10 marks)
6. (a) How video signals are processed and stored in Digital Computer ? Explain. (10 marks)
- (b) Give a detailed account on MPEG Compression. (10 marks)
7. Explain the JPEG Compression technique in detail. (20 marks)

[5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. DEGREE (SUPPLEMENTARY) EXAMINATION
DECEMBER 2020**

M.C.A.

MCA 10 501—OBJECT ORIENTED MODELING AND DESIGN

(2010 Syllabus Year)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Differentiate between Classes and Objects with illustrative examples. (10 marks)
- (b) What is meant by Inheritance ? Illustrate with examples. (10 marks)
2. (a) With suitable examples, bring out the concept of Encapsulation. (10 marks)
- (b) What is meant by Association ? What are the different types of Association ? Explain the notation of each in UML. (10 marks)
3. (a) What is Collaboration Diagram ? Illustrate with examples. (10 marks)
- (b) With examples, differentiate between composition and aggregation. (10 marks)
4. (a) What are Window Layout and Window Navigation Diagrams ? Explain with examples. (10 marks)
- (b) Write a detailed note on Deployment Diagrams. (10 marks)
5. (a) Explain the principle of closed behaviour and principle of type conformance in detail. (10 marks)
- (b) Describe any two Connasence abuses in Object Oriented Design. (10 marks)
6. (a) What do you mean by State Space of a Class ? With suitable examples, illustrate the relations between state space of a class and state space of its subclass. (10 marks)
- (b) What is Polymorphism ? Explain the dangers while using polymorphism in OO design. (10 marks)
7. (a) How can inheritance be misused in OO design ? Explain with examples. (10 marks)
- (b) Explain the different ways in which an OO designer may build up classes so as to support or not to support behaviour correctly. (10 marks)

**FIFTH SEMESTER M.C.A. (REGULAR/SUPPLEMENTARY) DEGREE
EXAMINATION, APRIL 2020**

M.C.A.

MCA 10 505-A—DATA MINING AND DATA WAREHOUSING

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Explain different data mining steps in the process of knowledge discovery with suitable diagram. (10 marks)
(b) Differentiate between OLAP and OLTP. (10 marks)
2. (a) Give an account on Data Mining Query Language (DMQL). (10 marks)
(b) Explain association rule mining with examples. (10 marks)
3. (a) What is clustering ? Briefly describe the partitioning and hierarchical clustering methods with example. (10 marks)
(b) Explain the differences between classification and regression. (5 marks)
(c) Write a note on Gain Ratio and Gini Index. (5 marks)
4. (a) Describe the architecture of OLAP servers. (10 marks)
(b) Explain different data mining applications in industry. (10 marks)
5. (a) What are rough sets ? How are they used for classification ? (10 marks)
(b) Discuss data integration and data transformation in detail. (10 marks)
6. (a) Explain the various data reduction techniques in the pre-processing step of data mining. (10 marks)
(b) With neat diagram, explain the different components of data warehouse. (10 marks)
7. (a) Explain Bayesian classification with suitable example. (10 marks)
(b) Write down the Apriori algorithm for discovering frequent item sets by Confined Candidate Generation. (10 marks)

**FIFTH SEMESTER M.C.A. (REGULAR/SUPPLEMENTARY) DEGREE
EXAMINATION, APRIL 2020**

M.C.A.

MCA 10 504-A—ELECTRONIC COMMERCE

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Discuss about Web Server hardware and software. (10 marks)
(b) What are the different modes of e-commerce ? (10 marks)
2. (a) Discuss security strategies and tools for e-commerce. (10 marks)
(b) How does one protect e-commerce assets ? (10 marks)
3. (a) Write about the design of e-payment systems. (10 marks)
(b) What is an electronic cash ? Write a detailed note on it. (10 marks)
4. (a) How do you create web presence ? (10 marks)
(b) What are the various strategies for purchasing and support of facilities ? (10 marks)
5. (a) Discuss International and legal issues in e-commerce. (10 marks)
(b) Discuss web auctions and strategies for e-commerce. (10 marks)
6. (a) What are the web-based tools for e-commerce ? (10 marks)
(b) How does one protect e-commerce assets ? (10 marks)
7. (a) Write a note on identifying and reaching customers. (10 marks)
(b) What is an intruder ? Explain the different intruder approaches. (10 marks)

**FIFTH SEMESTER M.C.A. (REGULAR/SUPPLEMENTARY) DEGREE
EXAMINATION, APRIL 2020**

M.C.A.

MCA 10 503—WIRELESS COMMUNICATION

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Is a directional antenna useful for mobile phones ? Give reasons. How can the gain of an antenna be improved ? (6 marks)
- (b) How are guard spaces realized between users in CDMA ? (4 marks)
- (c) Briefly explain FDMA, TDMA and SDMA and also mention their relevance. (10 marks)
2. (a) Name some key features of the GSM, DECT, TERA and UMTS systems. Which features do the system have in common ? (10 marks)
- (b) What multiplexing schemes are used in GSM and for what purpose ? Think of other layers apart from the physical layer. (10 marks)
3. (a) What are the insights which led to the development of I-TCP ? State the advantages and disadvantages of I-TCP. (10 marks)
- (b) What is the significance of encapsulation ? Explain IP-in-IP encapsulation. (10 marks)
4. (a) Compare IEEE 802.11, Hiper LAN2 and Bluetooth with regard to their ad-hoc capabilities. Explain how these technologies are focused in each cases. (10 marks)
- (b) What is flat ad-hoc routing ? Explain Proactive protocols and reactive protocols with their advantages and disadvantages. (10 marks)
5. (a) What is the main idea behind Wireless Application Environment (WAE) ? Explain WAE logical model with the help of a neat diagram. (10 marks)
- (b) Wriet a note on Wireless Session Protocol and also explain the general features needed for content exchange between co-operating clients and servers. (10 marks)

Turn over

6. (a) What is the problem with basic Aloha ? How CSMA schemes solve this problem ? Explain different CSMA systems. (10 marks)
- (b) Discuss the concept of handover regarding satellite communication system. (10 marks)
7. (a) What is GSM ? Explain its architecture with a neat diagram. (10 marks)
- (b) Explain the wireless diagram protocol. (10 marks)

**FIFTH SEMESTER M.C.A. (REGULAR/SUPPLEMENTARY) DEGREE
EXAMINATION, APRIL 2020**

M.C.A.

MCA 10 502—COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

Time : Three Hours

Maximum : 100 Marks

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

1. (a) How do you scan convert a circle? Briefly explain eight way symmetry in a circle.
(b) Explain the input and output pipeline of SRGP with a diagram.
(10 + 10 = 20 marks)
2. (a) Explain the process of 3D viewing with a diagram.
(b) What are the different levels of interaction devices? Write short note on any two interaction devices.
(10 + 10 = 20 marks)
3. (a) How is the media divided with respect to time in their representation space? Explain.
(b) Explain the different components of a MIDI synthesizer.
(10 + 10 = 20 marks)
4. (a) Write a short note on Image format.
(b) What are the different measures needed for Visual representation of an image? Explain.
(10 + 10 = 20 marks)
5. (a) Explain the major steps of data compression.
(b) Explain the process of Quantization.
(10 + 10 = 20 marks)
6. (a) What are the basic steps of audio encoding in MPEG? Explain with a diagram.
(b) What are the different Input devices used as Graphics hardware? Briefly explain each.
(10 + 10 = 20 marks)
7. (a) Explain Midpoint circle scan conversion algorithm.
(b) Write a short note on MIDI devices. What are the four modes of reception for MIDI devices?
(10 + 10 = 20 marks)
[5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. (REGULAR/SUPPLEMENTARY) DEGREE
EXAMINATION, APRIL 2020**

M.C.A.

MCA 10 501—OBJECT ORIENTED MODELLING AND DESIGN

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Write a note on Polymorphism.
(b) How messages are passed in Object Oriented System? Explain in detail.
(10 + 10 = 20 marks)
2. (a) Explain the following concepts :
(i) Overloaded operations.
(ii) Multiple inheritance.
(iii) Asynchronous messages with priority.
(b) Differentiate between :
(i) Specialization/Generalization.
(ii) Aggregation/Composition.
(10 + 10 = 20 marks)
3. (a) Mention any *two* diagrams used for capturing the software and hardware aspects of system architecture. Explain.
(b) Explain window-layout diagrams with example.
(10 + 10 = 20 marks)
4. (a) Write a note on domains of object classes.
(b) Explain the connascence? Explain different varieties of connascence.
(10 + 10 = 20 marks)
5. (a) Explain the concept of mix-in classes.
(b) What do you understand by class invariants? Explain.
(10 + 10 = 20 marks)
6. (a) What are the benefits of Object-Oriented Methodology?
(b) What is meant by support of states and behavior of a class? Explain.
(10 + 10 = 20 marks)
7. Write a note on :
(i) Design of a component.
(ii) Principle of closed behaviour.
(10 + 10 = 20 marks)
[5 × 20 = 100 marks]

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A. (2018 Syllabus)

MCA 18 505 (F)—MACHINE LEARNING

Time : Three Hours

Maximum : 100 Marks

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

1. (a) What is machine learning? Explain with specific examples.
(b) Explain with suitable examples, different types of learning.
(c) Differentiate between training, validation and testing.
(6 + 8 + 6 = 20 marks)
2. (a) Compare Classification with regression with an example.
(b) Distinguish between overfitting and underfitting. How it can affect model generalization?
(c) What are the applications of machine learning? Explain any four.
(6 + 6 + 8 = 20 marks)
3. (a) What are the benefits of pruning in decision tree induction? Explain different approaches to tree pruning.
(b) Explain Naïve Bayes Classifier with an example.
(10 + 10 = 20 marks)
4. (a) Compare Feature Extraction and Feature Selection techniques. Explain how dimensionality can be reduced using subset selection procedure.
(b) Explain DBSCAN algorithm for density based clustering. List out its advantages compared to K-means.
(10 + 10 = 20 marks)
5. (a) What is backpropagation? Explain the backpropagation training algorithm of a one hidden layer feed forward network.
(b) What are the different types of neural networks? Explain.
(10 + 10 = 20 marks)
6. (a) Difference between Deep and Shallow Network.
(b) What is deep learning? Explain its uses, application and history.
(c) Explain about Generative Adversarial Networks.
(4 + 8 + 8 = 20 marks)
7. (a) Draw and explain the architecture of convolutional network.
(b) Explain LSTM (Long Short Term Memory) networks.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A. (2018 Syllabus)

MCA 18 505 (E)—BIOINFORMATICS

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Differentiate between prokaryotic and eukaryotic cells.
(b) Illustrate the structure of DNA.
2. (a) Enumerate various exhaustive search methods in computational biology.
(b) List out applications of various exhaustive search methods.
3. (a) Write a note on BLAST, explaining the basic algorithm and options.
(b) Describe the applications and variants of BLAST.
4. (a) Explain the concept of scoring matrices for aligning amino acid sequences.
(b) Briefly explain how PAM is derived.
5. (a) Outline the steps for multiple sequence alignment.
(b) Explain the working procedure of MUSCLE algorithm.
6. (a) Briefly describe the topology of a phylogenetic tree.
(b) List out the steps involved in phylogenetic tree construction.
7. (a) Give an account on nucleic acid sequence and genome databases.
(b) What are different file formats (sequence and structure) in bioinformatics?

(5 × 20 = 100 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 505 D—NATURAL LANGUAGE PROCESSING

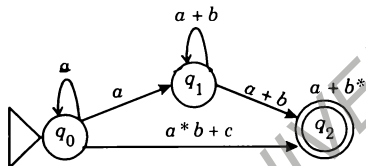
(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (A) Give a Deterministic Finite Automata for the language $L = \{ab^4wb^2 : w \in \{a, b\}^*\}$.
- (B) Find regular expression for the language accepted by the following automata :



2. (A) Explain in detail about Chomsky Hierarchy.
- (B) What do you mean by Morphology ? What is the basic difference between inflectional and derivational morphology ?
3. (A) Find context-free grammars for the following languages ($n \geq 0, m \geq 0, k \geq 0$).
 - (i) $L = \{a^n b^m : n \text{ (not =) } m - 1\}$.
 - (ii) $L = \{w \in \{a, b\}^* : n_a(v) \geq n_b(v), \text{ where } v \text{ is any prefix of } w\}$.
- (B) With an example explain about Earley parser.

Turn over

4. (A) Write down the steps for conversion of a Context Free Grammar to Chomsky Normal Form. Convert the following grammar into Chomsky Normal Form. (Show each steps) :

$$S \rightarrow ASB$$

$$A \rightarrow aAS \mid a \mid \epsilon$$

$$B \rightarrow SbS \mid A \mid bb.$$

- (B) Explain with an example CYK algorithm.

5. (A) What do you mean by parts of speech tagging ? How POS tagging is done with Hidden Markov Model ?

- (B) How is HMM used in Viterbi algorithm ? Explain.

6. (A) Explain the concept of Pruning and Beam search.

- (B) What is a Max Entropy Classifier ? List some application of Max Entropy classifier.

7. (A) Why smoothing is important in information retrieval ? What is Dirichlet smoothing ?

- (B) Explain about various Machine learning methods for coreference resolution.

(5 × 20 = 100 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A. (2018 Syllabus)

MCA 18 505 (C)— PATTERN RECOGNITION

Time : Three Hours

Maximum : 100 Marks

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

1. (A) Define pattern recognition and explain its different phases. Discuss the examples of pattern recognition tasks.
(B) Explain the concept of feature extraction in a pattern recognition system with examples.
2. (A) Assuming a Gaussian distribution of the features, explain the general principle of the maximum likelihood estimation for the following cases :
 - (i) Unknown mean and known covariance matrix.
 - (ii) Unknown mean and unknown covariance matrix.(B) Explain, why the maximum likelihood estimation is not working uniformly distributed training sets?
3. (A) Define unsupervised learning? Explain any 2 clustering algorithms.
(B) Apply K-means clustering algorithm on given data for $K=3$. Use $C_1(2)$, $C_2(16)$, $C_3(38)$ as initial cluster centers.
Data : 2, 4, 6, 3, 31, 12, 15, 16, 38, 35, 14, 21, 23, 25, 30.
4. (A) What is a feed-forward neural network? Explain its working.
(B) Describe the architecture and learning algorithm of backpropagation networks. List its limitations.
5. (A) What is a Self-Organizing Neural Network? Explain the architecture.
(B) Explain the Hopfield network.
6. (A) How can we calculate the performance of a classifier? Explain any 2 metrics used for the same.
(B) Explain Nonparametric Parzen classifiers.
7. (A) How can ANN be trained using unsupervised learning?
(B) Explain Competitive Learning in ANN.

(5 × 20 = 100 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A. (2018 Syllabus)

MCA 18 505 (B)—ADVANCED JAVA MOBILE PROGRAMMING

Time : Three Hours

Maximum : 100 Marks

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

1. Explain the concept of following technologies.
 - (a) Microwave Technology.
 - (b) Satellite Networks.
 - (c) Mobile Radio Networks.

(7 + 7 + 6 = 20 marks)
2. Explain the following :
 - (a) J2ME architecture.
 - (b) Small computing device requirements.
 - (c) User Interfaces in MIDlet.
 - (d) Device data in MIDlet.

(5 + 5 + 5 + 5 = 20 marks)
3. Explain the best practices and patterns in J2ME.

(20 marks)
4. Explain ItemClass and ItemListener with an example program.

(20 marks)
5.
 - (a) Explain the steps required to write and read string based records.
 - (b) Explain various JDBC driver types.

(12 + 8 = 20 marks)
6. Explain with an example program how to do the following :
 - (a) Insert a row to a table.
 - (b) Select all data from a table.
 - (c) Request multiple columns from a table.

(7 + 7 + 6 = 20 marks)
7. Explain J2ME MIDlets and Web Services.

(10 + 10 = 20 marks)
(5 × 20 = 100 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 505 (A)—INTERNET OF THINGS

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) With a neat diagram explain the architecture of IoT.
(b) Briefly explain some of the IoT applications.
(10 + 10 = 20 marks)
2. (a) How middleware plays a crucial role in IoT? Explain.
(b) Explain about security in IoT devices.
(10 + 10 = 20 marks)
3. (a) Explain in detail about M2M and WSN Protocols.
(b) List some issues with IoT Standardization.
(10 + 10 = 20 marks)
4. (a) What are the layers of ZigBee protocol architecture? Explain.
(b) How does BACnet protocol work?
(10 + 10 = 20 marks)
5. (a) What is main purpose of WoT in the lot? Briefly explain Unified Multitier WoT architecture.
(b) List some applications of mobile cloud computing.
(10 + 10 = 20 marks)
6. (a) What is an information cascade? Explain with a proper example.
(b) With an example explain about cascading behavior in networks.
(10 + 10 = 20 marks)
7. (a) Explain the role of clustering, synchronization and software agents in IoT Resource Management.
(b) Explain the role of the Internet of Things for increased autonomy and agility in collaborative production environments.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A. (2018 Syllabus)

MCA 18 504 (E)—INTRODUCTION TO SOFT COMPUTING TECHNIQUES

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Compare feed forward and feedback networks.
(b) Distinguish between fuzzy and probability with example.
(c) Define soft computing. Mention the applications of soft computing.

(5 + 5 + 10 = 20 marks)
2. (a) With the help of a neat diagram, explain the features of membership function.
(b) Justify the statement : "Partial membership is allowed in fuzzy sets".

(10 + 10 = 20 marks)
3. (a) Explain in detail ANN architectures and various ANN models.
(b) Design logical AND using Perceptron network for bipolar inputs and targets.

(10 + 10 = 20 marks)
4. (a) With a suitable architecture, explain the various steps in back propagation learning algorithm.
(b) Explain different layers available in back propagation and explain the applications of ANN.

(10 + 10 = 20 marks)
5. (a) Mention the stopping condition for genetic algorithm flow.
(b) Differentiate between uniform and three parent cross over.
(c) Compare genetic learning of rule bases and knowledge bases.

(5 + 5 = 20 marks)
6. (a) Why McCulloch-Pitts neuron is widely used in logic functions? Explain the architecture of McCulloch-Pitts neuron.
(b) Explain the following fuzzy inference mechanism :
 (i) Sugeno Fuzzy Models.
 (ii) Tsukamoto Fuzzy Models.

(10 + 10 = 20 marks)
7. (a) Explain in detail about the various operation involved in genetic algorithm.
(b) With a neat flow chart, explain the operation of simple genetic algorithm.

(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 504 (D)—MOBILE COMPUTING

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Explain in detail the Mobile computing issues and challenges.
(b) Write short note on :
 - (i) Portable characteristics.
 - (ii) Mobility characteristics.

(10 + 10 = 20 marks)
2. (a) What is Multiplexing? Explain the types of multiplexing.
(b) Describe major Wireless Communication principles.

(10 + 10 = 20 marks)
3. (a) What are the different location management update principles? Explain.
(b) Briefly explain location management architecture and its types.

(10 + 10 = 20 marks)
4. (a) What are the different types of Individual mobility model? Explain.
(b) What is Information Dissemination? Explain in detail.

(10 + 10 = 20 marks)
5. (a) Write short notes on :
 - (i) J2ME.
 - (ii) Android.
 - (iii) Palm OS.
(b) Explain Wireless Sensor Network and its applications.

(10 + 10 = 20 marks)
6. (a) Describe in detail the registration procedure in Mobile IP.
(b) Differentiate IPv.4 and Ipv.6 protocols in detail.

(10 + 10 = 20 marks)
7. (a) Write about :
 - (i) Information management issues.
 - (ii) Trust management and anonymity issues.
(b) Explain cellular architecture in mobile computing.

(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 504 (C)—CYBER SECURITY

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Explain with examples some of the attacks threatening confidentiality and Integrity.
(b) Explain the architecture of Firewall. What are the various Characteristics of Firewall?
(10 + 10 = 20 marks)
2. (a) Explain the advanced technology in security.
(b) What is Adhoc network? Explain methods to provide security in Adhoc network.
(10 + 10 = 20 marks)
3. (a) Explain Ethical Hacking and its fundamentals.
(b) Define Web Application Penetration Testing in cyber security and explain its types.
(10 + 10 = 20 marks)
4. (a) What are the Web Application Technologies used in cloud security? Explain.
(b) Write a note on :
 - (i) Deployment models.
 - (ii) Cloud security design principles.
(10 + 10 = 20 marks)
5. (a) How to provide security using biometric technologies?
(b) Briefly explain the algorithms used for interpretation.
(10 + 10 = 20 marks)
6. (a) Give a note on biometric competing technologies.
(b) Explain about voice data acquisition.
(10 + 10 = 20 marks)
7. (a) What is session hijacking? Explain the steps to hijack a session and dangers posed.
(b) Why is session hijacking successful? What are the key session hijacking techniques? Explain.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 504 (B)—DIGITAL IMAGE PROCESSING

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Explain the fundamental steps in Digital Image processing.
(b) Explain Image Sampling and Quantization. Explain with an example.
2. (a) (i) Explain basic relationship between pixels.
(ii) What is resolution? Explain gray level and spatial resolution.
(b) Explain the gray level transformation – image negatives and log transformation.
3. (a) Briefly explain the model of Image Degradation/Restoration process with diagram.
(b) Write a short note on :
 - (i) Gaussian noise.
 - (ii) Rayleigh noise.
 - (iii) Erlang (Gamma) noise.
 - (iv) Exponential noise.
4. (a) What is image compression? Briefly explain Huffman coding compression algorithm and Run Length encoding algorithm.
(b) Explain fundamental operations of Morphological Image Processing.
5. (a) What are the derivative operators useful in image segmentation? Explain their role in Segmentation.
(b) Explain about Region based Segmentation.
6. (a) Explain Constrained least mean square filtering and Wiener filtering.
(b) Define Image Restoration. Compare image enhancement and restoration techniques.
7. (a) Explain on the basic steps for filtering used to enhance an image in frequency domain.
(b) Discuss how the spatial filters are used in Digital Image Enhancement ?

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 504 (A)—BIG DATA TECHNOLOGIES

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) What is big data? Explain the importance of big data and its dimensions.
(b) Define virtualization and explain the relevance of NoSQL. (10 + 10 = 20 marks)
2. (a) What is statistical analysis? Explain the tools used for text analytics.
(b) Elaborate advanced big data analytics techniques with suitable examples. (10 + 10 = 20 marks)
3. (a) Explain the following with R programs :
(i) Matrices.
(ii) Arrays.
(iii) Data Frames.
(b) Explain various data types in R programming. (10 + 10 = 20 marks)
4. (a) Explain how Hadoop Yarn improves high availability and scalability of Hadoop computing cluster.
(b) What are the importance of Hadoop framework in application development?
(c) Explain working of MapReduce framework with an example. (10 + 5 + 5 = 20 marks)
5. (a) Describe various visual analysis techniques used for data analysis.
(b) Illustrate and explain HBase architecture and Data Processing Operators in Fig. (10 + 10 = 20 marks)
6. (a) Draw a neat diagram of the Hadoop ecosystem and list the seven important tools in it.
(b) Exemplify Hadoop Ecosystem and explain the involvement of Hadoop elements at various stages of Data Processing. (10 + 10 = 20 marks)
7. (a) List any six features of NoSQL that enables it to be used for Big Data Storage.
(b) Explain the types of NoSQL storage devices.
(c) Explain volume, velocity and variety concepts of Big data. (10 + 5 + 5 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 503—WEB PROGRAMMING

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Compare static web pages with dynamic web pages and list any 6 form elements used in HTML along with its attributes.
(b) Explain HTTP request and response in detail.
(10 + 10 = 20 marks)
2. (a) Briefly explain how to establish a connection between PHP and MySQL database.
(b) Define PHP variables with suitable example and explain the process of passing form data between pages.
(10 + 10 = 20 marks)
3. (a) Explain `elif`, `for`, `while`, `break` and `continue` statements in python for examples with each.
(b) Explain difference between users defined and built in function and explain the scope of local and global variable.
(10 + 10 = 20 marks)
4. (a) Differentiate between Client side and Server side scripting languages and discuss about Apache web server.
(b) Explain developing Python Server Side Pages (PSP).
(10 + 10 = 20 marks)
5. (a) Explain sql commands and write a PHP Program to update a student mark from the mysql Database `stud` (`rno`, `name`, `mark`), based on the student roll number.
(b) Explain Python functions for SQLite operations.
(10 + 10 = 20 marks)
6. (a) What is hypertext? Explain its phases. Mention various methods and status codes of http.
(b) Explain HTTP request and response in detail and discuss the use of Cascading Style Sheets in web programming.
(10 + 10 = 20 marks)
7. (a) Explain server MVC design pattern using Django.
(b) Explain DDL, DML and DCL syntaxes with example.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 503—WEB PROGRAMMING

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

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(b) Explain HTTP request and response in detail.
(10 + 10 = 20 marks)
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(b) Explain DDL, DML and DCL syntaxes with example.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 502— WIRELESS COMMUNICATION

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Write a note on 1G, 2G, 3G and 4G wireless technologies.
(b) Give an overview of different types of antennas used for wireless transmission.
(10 + 10 = 20 marks)
2. Explain the system architecture of GSM in detail.
(20 marks)
3. (a) Explain the various entities in a mobile IP network.
(b) Explain the circumstances that led to the implementation of reverse tunnelling.
(10 + 10 = 20 marks)
4. (a) Compare IEEE 802. 11a and IEEE 802. 11b.
(b) Explain ad-hoc wireless networks. What are its advantages?
(5 + 15 = 20 marks)
5. (a) Explain the WAP client-server model.
(b) Explain the WAP protocol stack.
(8 + 12 = 20 marks)
6. (a) Write a short note on :
(i) IP-in-IP encapsulation.
(ii) Generic Routing Encapsulation.
(b) Provide an overview of various TCP mechanisms including the advantages and disadvantages of each.
(10 + 10 = 20 marks)
7. (a) Explain in detail :
(i) Frequency Division Multiplexing.
(ii) Time division Multiplexing.
(b) Write a short note on :
(i) Amplitude Shift Keying.
(ii) Frequency Shift Keying.
(10 + 10 = 20 marks)

**FIFTH SEMESTER M.C.A. DEGREE (REGULAR) EXAMINATION
APRIL 2021**

M.C.A.

MCA 18 501—COMPUTER GRAPHICS

(2018 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

1. (a) Explain Random Scan Systems.
(b) Write a note on Color CRT, LCD and DVST.
(5 + 15 = 20 marks)
2. Explain Midpoint Ellipse Algorithm with example.
(20 marks)
3. (a) Explain different basic transformation in detail.
(b) Explain Sutherland Hodgeman Polygon Clipping with example.
(10 + 10 = 20 marks)
4. (a) Distinguish between parallel projection and perspective projection.
(b) Explain Visible Surface Detection methods.
(10 + 10 = 20 marks)
5. (a) Explain the process of designing an animation sequence.
(b) Write a short note on computer animation languages.
(10 + 10 = 20 marks)
6. Explain the applications of computer graphics.
(20 marks)
7. (a) Write a note on Raster animations.
(b) Write a note on Morphing.
(10 + 10 = 20 marks)

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

M.C.A.

MCA 10 505 (A)—DATA MINING AND DATA WAREHOUSING

(2010 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

- I. (a) Describe various data mining task primitives in detail.
(b) Explain the significance of data transformation in data mining. Also explain the different data transformation strategies. (10 + 10 = 20 marks)
- II. (a) Write down the Apriori algorithm for discovering frequent item sets by Confined Candidate Generation.
(b) Describe the major issues in Data Mining. (10 + 10 = 20 marks)
- III. (a) Explain decision tree induction algorithm in detail.
(b) Explain, how rough sets are used in classification ? (10 + 10 = 20 marks)
- IV. (a) Compare and contrast OLTP and OLAP.
(b) Discuss the representation, schema and measures of a multi-dimensional model in a Data Warehouse. (10 + 10 = 20 marks)
- V. (a) Explain the various steps involved in data cleaning process.
(b) What do you mean by attribute in a data field? Explain the different types of attributes with suitable examples. (10 + 10 = 20 marks)
- VI. (a) What is PCA? Explain how it can be used for reduction of data dimension.
(b) Give an account on different data mining applications. (10 + 10 = 20 marks)
- VII. (a) What is Outlier Analysis? Explain the different types of Outliers.
(b) Explain K-means and K-medoid clustering algorithm with example. (10 + 10 = 20 marks)

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

M.C.A.

MCA 10 504 (A)—ELECTRONIC COMMERCE

(2010 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

- I. (a) Discuss the pros and cons of the internet for e-commerce.
(b) Discuss different web technologies used for e-commerce. (10 + 10 = 20 marks)
- II. (a) Explain the Commercial Transaction Process in E-Commerce.
(b) List and briefly define three classes of intruders. (10 + 10 = 20 marks)
- III. (a) What is electronic fund transfer? What are the security issues involved in it?
(b) Elaborate Smart Cards and Electronic Payment Systems. (10 + 10 = 20 marks)
- IV. (a) Elaborate Low-Cost Ecommerce Marketing Strategies.
(b) Explain Four Positional E-strategic Directions. (10 + 10 = 20 marks)
- V. (a) Explain the Legal Issues of Internet Commerce.
(b) Explain about Business-to-Business Web Auctions. (10 + 10 = 20 marks)
- VI. (a) How should business strategic planners consider the internet and E-commerce? You may consider IS (Information Systems) strategies and/or ICT (Information's Communication Technology) planners?
(b) Explain disadvantages in using Internet and Web Technology in supply chain management. (10 + 10 = 20 marks)
- VII. (a) Explain various limitations of On-line Marketing.
(b) List the advantages and disadvantages of EDI. (10 + 10 = 20 marks)

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

M.C.A.

MCA 10 503—WIRELESS COMMUNICATION

(2010 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

- I. (A) What is CDMA? Explain.
(B) With neat diagrams explain Frequency Hoping Spread Spectrum. (10 + 10 = 20 marks)
- II. (A) Explain in detail about FDMA.
(B) What do you mean by the concept of polling? What are the advantages and disadvantages of the same? (10 + 10 = 20 marks)
- III. (A) With neat diagram explain about Bearer services and Tele services reference model.
(B) What is the need of Handover procedures in cellular systems? Which are the different possible handover scenarios in GSM? (10 + 10 = 20 marks)
- IV. (A) Explain in detail about GPRS.
(B) What is DAB? Explain the components of a DAB sender. (10 + 10 = 20 marks)
- V. (A) Which are the different ways in which registration of a mobile node can be done? Explain.
(B) What is triangular routing? How the route can be optimized? (10 + 10 = 20 marks)
- VI. (A) Explain about infrared and radio transmission. What are the advantages and disadvantages of the same?
(B) With neat diagram, explain the protocol architecture of 802.11. (10 + 10 = 20 marks)
- VII. (A) Explain the components in architecture of WAP.
(B) Discuss about Wireless transport layer security specification. (10 + 10 = 20 marks)

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

M.C.A.

MCA 10 502—COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

(2010 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

- I. (a) Explain 2D transformation briefly with neat diagram.
(b) Write down and explain the midpoint circle drawing algorithm. Assume 8 cm as the radius and co-ordinate origin as the centre of the circle?
(10 + 10 = 20 marks)
- II. (a) Discuss about Interaction Hardware Devices.
(b) Explain 3D transformation with neat diagram.
(10 + 10 = 20 marks)
- III. (a) List and explain the basic tools that are required for the multimedia.
(b) Explain different types of Audio File Formats.
(10 + 10 = 20 marks)
- IV. (a) Write about popular animation techniques.
(b) Explain Architecture of a raster display.
(10 + 10 = 20 marks)
- V. (a) Explain Huffman Coding.
(b) Explain Video Encoding.
(10 + 10 = 20 marks)
- VI. (a) Explain graphics used in different sector.
(b) Elaborate the Types of individual images in MPEG : I, B, and P frames.
(10 + 10 = 20 marks)
- VII. (a) Discuss about Lossless audio formats.
(b) Briefly describe the basic steps and principles involved with designing a multimedia Web site.
(10 + 10 = 20 marks)

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

M.C.A.

MCA 10 501—OBJECT ORIENTED MODELLING AND DESIGN

(2010 Syllabus)

Time : Three Hours

Maximum : 100 Marks

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

- I. (A) What do you mean by inheritance? Explain with an example.
(B) Differentiate between Structured programming and Object oriented programming.
(10 + 10 = 20 marks)
- II. (A) What is a sequence diagram? Explain the different parts of sequence diagram.
(B) Describe with an example the concept of state diagrams.
(10 + 10 = 20 marks)
- III. (A) What is a class diagram? What is the purpose of a class diagram? Which are the different types of relationships that exist between classes inside a class diagram? Explain.
(B) Explain in detail about activity diagrams. Draw the activity diagram for process of student enrolment in a university.
(10 + 10 = 20 marks)
- IV. (A) Describe in detail about package diagrams.
(B) Briefly explain the concept of window navigation diagrams.
(10 + 10 = 20 marks)
- V. (A) What do you mean by encumbrance? Explain.
(B) Explain the following with examples :
(i) Class invariant.
(ii) Precondition and post condition.
(5 × 2 = 10 marks)
- VI. (A) With an example explain the concept of mix in classes.
(B) What is a component? What are the principles of component based design?
(10 + 10 = 20 marks)
- VII. (A) Explain the concept of light weight and heavy weight components.
(B) Explain the uses and abuses of inheritance.
(10 + 10 = 20 marks)