Roll No. .....

# 67104-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-22 Examination – December, 2024

### COMPUTER VISION ELECTIVE 1 (i)

**Paper : 21MCA23DA1**

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** (a) How do active contours contribute to shape modelling and recognition ? $8 \times 2 = 16$

(b) What are thresholding techniques and how are they used to segment images ?

(c) What is the Generalized Hough Transform (GHT) and how does it differ from the standard Hough Transform ?

(d) Provide examples of real-world applications where the Hough Transform is used for image analysis.

(e) What is motion in the context of computer vision ?

(f) Explain the triangulation method used in motion estimation.

(g) Explain some applications of computer vision in agriculture and environmental monitoring.

(h) How is computer vision applied in surveillance systems ?

## UNIT – I

2. (a) What are edge detection techniques and how are they used to identify object boundaries in images ? 8

   (b) How are size filtering techniques applied to extract objects of interest from images ? 8

3. Explain the process of skeletonization in image processing. How does thinning help in extracting the essential features of shapes ? Discuss algorithms for skeletonization and their applications. 16



## UNIT – II

4. Give examples of real-world applications where Hough Transform is used for object detection and recognition. How does Hough Transform contribute to solving practical problems ? 16

5. Describe the speed problem associated with traditional Hough Transform for circle detection. How does it affect the efficiency of circle detection algorithms ? 16

## UNIT – III

6. Discuss methods for 3D object recognition in computer vision. How do techniques like feature matching and geometric hashing identify objects in 3D scenes ? 16

7. (a) Discuss spline-based motion representation techniques. How do spline curves model smooth and continuous motion trajectories ? 8

   (b) Describe different projection schemes used in 3D vision systems. How do techniques like perspective projection and orthographic projection represent 3D scenes ? 8

## UNIT – IV

8. Discuss the role of computer Vision in in-vehicle vision systems. How do such systems locate roadways, road markings, road signs and pedestrians ? 16

9. (a) Discuss the Chamfer matching technique for object tracking and recognition. 8

(b) Explain how computer vision is used in creating a photo album application. 8

---

Roll No. .....

# 67103-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2020-21 Examination – December, 2024

### ANDROID MOBILE APPLICATION DEVELOPMENT

Paper : 21MCA23C3

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note :* Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. *Compulsory Questions* : $8 \times 2 = 16$

(a) What is Content Provider ?

(b) What is DDLs ?

(c) What is ADK ?

(d) What is Intent ?

(e) What is a Map Activity ?

(f) What is Map View ?

(g) What is an Android Shadow ?

(h) What is a Serialization ?

## UNIT – I

2. (a) How Android Operating System is important ? What are different types of Android Application ? Explain with example. 10

(b) How Infrastructure and Managing Resources are works ? Explain with example. 6

3. Explain the following with example : $4 \times 4 = 16$

(a) Application Model

(b) Concurrency and Resource Management

(c) Mobile Device Profiles

(d) Mobile Software Engineering

## UNIT – II

4. (a) What is Android Application Architecture ? How it works ? Explain with example. 8

(b) What is role of Android Framework ? Explain GUI and MVC Architecture with example. 8

5. Explain with example : $4 \times 4 = 16$

(a) Packaging and deployment

(b) Applications with multiple screens



(c) Location based services

(d) Traditional programming model

## UNIT – III

6. (a) What is purpose of a content provider in Android and provide an example of a scenario where it might be used ? 8

(b) What is Life Cycle for an application ? Explain Blank Ul, Folding and Unfolding a scalable UI with example. 8

7. Explain the following with example : $4 \times 4 = 16$

(a) Map View and Map Activity

(b) Sensors and Near Field Communication

(c) Building Client Server Applications

(d) Google Maps Activity

## UNIT – IV

8. (a) What do you know the process of publishing an Android app to the Google Play Store ? Explain the steps involved and any requirements that developers need to meet. 10

(b) What is Flutter ? Explain the Android features and UI with example. 6

9. (a) What is Bluetooth ? How Camera and Sensor integration with Bluetooth ? Explain Sending SMS, Phone Calls and Runtime Environment for Applications with example. 10

(b) What are Callbacks ? Explain Concurrency, Serialization and Application Signing with example. 6

---

*Roll No.* .....

# 67107-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-2022 Examination – December, 2024

### NETWORK PROGRAMMING ELECTIVE-II (i)

**Paper : 21MCA23DB1**

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** (a) How to change the password in UNIX OPERATING SYSTEM ? $8 \times 2 = 16$

(b) How many types of files are there in UNIX ?

(c) How to display the contents of a file ?

(d) What is the role of server ?

(e) What are the basic operations of Server Socket ?

(f) Distinguish between absolute URL and relative URL.

(g) What is retransmission in networking ?

(h) What is difference between IPv4 & IPv6 ?

## UNIT – I

2. (a) What is OSI model and how it communicates data in networks ? 8

(b) What are the functions of a transport layer in networking ? How it provides logical communication between application processes running on different hosts ? 8

3. (a) Describe the OSI reference model and UNIX Standards. 8

(b) Write briefly about the TCP and UDP connection establishment, format and Buffer sizes. 8

## UNIT – II

4. (a) Explain with diagrams the following I/O models provided by UNIX : 16

(i) Blocking I/O model

(ii) Non Blocking I/O model

(iii) Signal driven I/O

5. (a) How do I open a socket ? 8

(b) What is a DLL and what their usages and advantages ? 8



## UNIT – III

6. (a) What are the different layers of WAP architecture ? 8

(b) What is a firewall ? How do you set it up ? 4

(c) Difference between RMI and CORBA. 4

7. (a) Define in brief, "Wireless Application Environment (WAE)". 8

(b) Explain in detail the various aspects of security. 8

## UNIT – IV

8. (a) Consider the TCP Echo Server and TCP Echo Client application and discuss what happens to the client when the server process crashes ? 8

(b) What is the difference between client-side and server-side programming language ? 8

9. (a) Describe the getaddr info function as applicable to IPV6. Write briefly about IPV4 socket options. 8

(b) Explain the purpose and syntax of select system call. What conditions cause select to return "ready" for sockets ? 8

---

*Roll No.* .....

# 67108-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-22 Examination – December, 2024

### NATURAL LANGUAGE PROCESSING & SPEECH RECOGNITION ELECTIVE II (ii)

**Paper : 21MCA23DB2**

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** ***Compulsory Question :***

(a) Elaborate five phases of NLP.

(b) What are advantages of automata ?

(c) What is minimum edit distance ?

(d) What is prosody in TTS ?

(e) Define human speech recognition.

(f) What is the use of symbol table in context-free grammar ?

(g) Discuss the principles of compositionality in semantic.

(h) Where is matrix factorization used ?

## UNIT – I

2. What is lexicon ? How lexicon free finite state transducers processing is done ?

3. How terms are extracted from token ? Explain the concept in context of raw text extraction and tokenization.

## UNIT – II

4. What are latent semantics ? How latent semantics are analyzed ? Discuss.

5. What is phenome ? Discuss various phonological rules and how text to phones mapping is done for TTS.

## UNIT – III

6. What is tagging ? Explain stochastic part-of speech tagging and transformation based tagging with appropriate example.

7. Explain rules and tree formation for context free grammar. How sentence level construction is specified ? Discuss.



## UNIT – IV

8. What is parsing in context-free grammar ? Explain the concept of feature structures, their unification and feature structures in grammar.

9. What is syntax-driven semantic analysis ? How semantic analysis is integrated into the earley parser ?

---

Roll No. .....

# 67101-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-2022 Examination – December, 2024

### DATA MINING & BIG DATA ANALYSIS

Paper : 21MCA23C1

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** (a) Define Data Mining Systems along with its core components.

(b) State Apriori principle followed in Association mining.

(c) Define supervised and unsupervised learning ? Give ***one*** example for each.

(d) List down any ***four*** desirable characteristics of clustering methods.

(e) Explain the variety and veracity characteristics of Big data.

(f) Differentiate between Hadoop environment and Hadoop ecosystem.

(g) Briefly explain the working of YARN, as a heart of complete Hadoop ecosystem.

(h) Write down any *four* features of Big R making it most appropriate choice for handling big data.

## UNIT – I

**2.** (a) How orientation, focus, type of users, schema used, size of query and data operations differs OLTP from OLAP ?

(b) Define Data Objects. Differentiate between different types of data objects along with *two* examples for each.

**3.** (a) Elaborate the concept of Candidate set generation (Apriori algorithm). Performance evaluators and frequent sequential patterns related to Association mining.

(b) What do you mean by association rules ? Explain different types of association rules generated after implementing Pattern mining.



## UNIT – II

**4.** (a) Elaborate the working of Decision Tree Induction algorithm, making it greedy and non back tracking classifier.

(b) Explain how different classifiers can be evaluated by using accuracy and specificity by using Confusion matrix.

**5.** (a) Describe how K Mean (Partitioning) Clustering detects the outliers and create clusters.

(b) Differentiate between DIANA and AGNES techniques following hierarchical concepts to generate clusters with the help of labeled diagrams.

## UNIT – III

**6.** (a) Explain how Structured, Semi structured and Unstructured data along with their respective characteristics and examples (*One* for each type).

(b) Elaborate different phases of Big data analytics life cycle, making it appropriate for batch as well as stream processing.

**7.** (a) Differentiate between data analytics performed by using Hadoop and different Unix tools.

(b) Elaborate how data compression and serialization plays a vital role in big data analytics with appropriate examples.

## UNIT – IV

8. (a) Describe the following concepts : Job scheduling and shuffling with respect to Map Reduce with their respective importance in processing big data.

   (b) Why Pig is considered as an integral component of Hadoop ecosystem ? Explain the same in terms of its architecture.

9. (a) Elaborate the architecture of HBase and what important role does Region servers play in it.

   (b) Define collaborative filtering and explain its types. How it enhance the data analytics process ?

---

*Roll No.* .....

# 67105-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-22 Examination – December, 2024

### SOFTWARE TESTING & QUALITY ASSURANCE ELECTIVE 1 (II)

Paper : 21MCA23DA2

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*.

**1.** Explain the following in brief :

(a) Test drivers

(b) Testing tools

(c) Regression testing

(d) Capability maturity models

(e) Quality management

(f) Database testing

(g) Goals of software quality assurance

(h) FTR

## UNIT – I

2. (a) What is Software testing ? How is testing important in software life cycle ? Discuss the objectives of software testing in detail.

   (b) Explain the following in detail :

   (i) Software testing guidelines

   (ii) Customizing the software testing process

3. What is White box testing and Black box testing ? Explain the main techniques for performing black box testing.

## UNIT – II

4. (a) What is Software Testing Strategy ? Explain the characteristics of a good software testing strategy in detail.

   (b) Explain the following in detail :

   (i) Test data generator

   (ii) Debuggers



5. (a) What is Software Metrics ? Enumerate the qualities of good software metrics. How the software metrics can help in software management ? Explain in detail.

   (b) Explain integration, System, Alpha and Beta testing in detail.

## UNIT – III

6. Explain the following in detail :

   (a) Testing Web Application

   (b) Rational Rose and its Features

7. What is object oriented testing ? Explain the various object-oriented testing strategies and issues in detail. Also explain path testing and class testing.

## UNIT – IV

8. What is Software Quality Assurance (SQA) ? Explain the components, importance and essence of SQA in detail.

9. (a) What are ISO quality standards ? Explain ISO 9000 certification and their relevance in detail.

   (b) What is Software Quality ? What are the important software quality attributes ? Also explain the software quality challenges in detail.

---

*Roll No.* .....

# 67102-N

## MCA 3rd Semester (MCA 2 Year Programme) w.e.f. 2021-2022 Examination – December, 2024

### ARTIFICIAL INTELLIGENCE & COMPUTATIONAL INTELLIGENCE

Paper : 21MCA23C2

*Time : Three hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** *Compulsory Questions* :

(a) How problem can be defined as state space ?

(b) How candidate analysis is done in expert system ?

(c) What is skolemization ?

(d) How reasoning is done with semantic network ?

(e) What is content addressable memory ?

(f) Why GA is used rather than traditional search methods ?

(g) Define hedge with example.

(h) How learning can be applied in pattern recognition ?

## UNIT – I

2. What is heuristic function ? Discuss how heuristic function helps during search procedure ? On the basis of heuristic function, how best first and A* algorithms are different from each other. Explain with example.

3. What is prototype ? Discuss the purpose of prototyping ? How a prototype is constructed in expert system ? List out the steps of prototype construction in detail.

## UNIT – II

4. (a) What is knowledge engineering ? Explain the activities and views related to knowledge engineering ? Also discuss the role of knowledge acquisition in KE.

   (b) What is conflict resolution ? Discuss various strategies for conflict resolution.



5. (a) What is truth Maintenance System ? Compare justification based, assumption based and logic based truth maintenance system with each other.

   (b) What is probabilistic reasoning ? How probability can be determined with uncertain knowledge ? Discuss.

## UNIT – III

6. (a) Discuss the working principle and architecture of McCulloch-Pitts neural network with diagrammatic notation and appropriate example.

   (b) What is selection in Genetic algorithm ? Describe various selection methods used in GA.

7. (a) What is perceptron ? Discuss the operational characteristics, elements and training algorithm for single output unit of perceptron.

   (b) What is optimization ? How optimized result can be achieved on the basis of Ant Colony optimization method ?

## UNIT – IV

8. (a) What is fuzzy logic ? Explain component architecture of fuzzy logic with diagrammatic representation ?

   (b) What is fuzzy inference system ? Discuss the construction, working and methods of FIS.

9. (a) Discuss the architecture, components and steps of design of Fuzzy control system.

(b) What is Information retrieval ? How computational intelligence is used in IR ?

---