

## MCA (SEM-IV) Minor EXAMINATIONS, 2019

CS1612 Artificial Intelligence

Time: 1 Hour Maximum Marks: 5

Date: February 23, 2019

- o Attempt all questions.
1. Whether the admissibility property of a heuristic implies monotonicity? Give explanation for your answer. (2)
  2. Explain the advantages of modelling AI problems as search. Solve the "wolf-goat-cabbage problem" using state space graph search. Description: You are on left bank of a river with a boat, a cabbage, a goat, and a wolf. Your task is to get everything to the other side. Formulate it using initial state, goal state, and operators etc. Suggest a heuristic for solving it using Greedy search by using your heuristic. Restrictions:
    - only you can handle the boat
    - when you're in the boat, there is only space for one more item
    - you can't leave the goat alone with the wolf, nor with the cabbage (as something will be eaten).Find a path from the initial state to the final state. (4)
  3. Draw two levels of game tree for Tic-Tac-Toe starting with empty board configuration. Suggest an evaluation function and optimal strategy to play. (4)
  4. Compare the following search strategies: Uniform Cost Search, IDA\* (2)
  5. Consider a game tree which is complete binary tree of depth 3 with leaf scores from left to right: 0, 5, 3, -3, 2, -5, 7, 4. Determine the optimal strategy using Mini-Max method. What is the drawback of Mini-Max method and how it is overcome by Alpha-Beta cut-off method? Which nodes will be cut-off using Alpha-Beta search method? What do you mean by optimal ordering of leaf nodes? If the leaf nodes are optimally ordered, how many nodes will be needed to be evaluated using Alpha-Beta search? (3)

Computer Science, Jamia Millia Islamia

Internal Assessment Test (IIst) of B.T.U. 4<sup>th</sup> February, 2019

Sub: Software Project Management (C31248), Date: 26-02-2019, Time: 10:30-11:30

Time: 1 hr

Max Marks: 15

Note: Attempt all the questions.

Q1. Attempt any three of the followings:-

<3X3=9>

- What is Project management cycle? Explain.
- What is Management Spectrum? Explain.
- What is SPM Framework? Explain.
- Explain COCOMO; discuss how to calculate Effort and Cost

Q2a. Explain Work Breakdown Structure (WBS) with the help of suitable example or case study. <3>

b. Draw Gantt chart of the given data

<3>

Task Identifier	Task Description	Predecessor Task(s)	Time (days)
1	Establish project		2
2	Establish customer requirements	1	3
3	Produce software specification documents	2	4
4	Write test plans	3	1
5	Write code	3	2
6	Developer testing	5	2
7	System testing	4, 6	4
8	Write customer documentation	3	3

*Department of Computer Science,  
Jamia Millia Islamia  
B.Sc. SEM IV - Cryptography*

Date : 27-2-2019

All questions are compulsory.

Duration : 1 hour

Total Marks : 15

- 
1. What is the difference between passive and active security threats? 5 marks  
List and briefly define categories of passive and active security attacks.
  
  2. Construct a Playfair matrix with the key - occurrence. Make 5 marks reasonable assumptions about how to treat redundant letters in the key. Using the matrix encrypt the following: Encrypt to show how Playfair rates.
  
  3. Using the Vigenere cipher, encrypt the word cryptography, using the 5 marks key house.

M.C.A.(SEM-I-V) / Mid Term / 2019

CSC612: Big Data and Cloud Computing

Time: 60 minutes

Maximum Marks:15

Attempt any two questions. Each question carries equal marks.

1. (a) What is big data problem? Explain various Big Data Categories.  
(b) What are various sources of big data? Explain Common Big Data Customer Scenarios
2. (a) What is Hadoop? Explain Hadoop Architecture.  
(b) What are various Cluster mode of Hadoop? Explain fully distributed mode.
3. (a) What are Goals of HDFS? Explain Data Loading Techniques and Data Analysis  
(b) What is MapReduce? How does MapReduce Work? Explain it with a suitable example.

DEPARTMENT OF COMPUTER SCIENCE  
Janata Millia Islamia

Subject: CSE541 (J2EE)  
(Even Semester, 2018-19)

Course: MCA (Semester - IV)  
Duration: 01 Hour

Subject: CSE541 (J2EE)  
Max. Marks: 15

ATTEMPT ALL THE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS. RESTRICT TO THE RELEVANT ANSWERS ONLY.

1. Write down any two differences between a desktop-based application and Web-based applications. What is the need of Web-application architecture? Explain J2EE application architecture with a neat diagram [1+1+3].
2. Write down any two advantages of SAX parser over DOM parser. What is DTD? Write down DTD for the following xml file: [1+1+3]

```
<vehicle>
    <two-wheeler>
        <bike>Pulsar 220</bike>
        <scooter>Aprilia</scooter>
    </two-wheeler>
    <four-wheeler>
        <car>Honda City</car>
    </four-wheeler>
    <heavy-vehicle>
        <truck> Truck 1 </truck>
        <bus> Bus</bus>
    </heavy-vehicle>
</vehicle>
```

3. Answer the following in one/two sentence(s) (1x5 = 5):
  - What is the purpose of org.w3c.dom package in Java?
  - What are factory classes?
  - What is the purpose of PEP and HTTPs protocols?
  - Write down any one advantage of Connection pooling.
  - Write HTML code to design the following Web form:

Name  Password

## 2<sup>nd</sup> Sessional Test 4/2/1

1. What is group cohesiveness. What are the basis of group cohesiveness? What are the benefits of group cohesiveness?
2. Explain in details the Physiological, Psychological and Behavioral symptoms of stress. What a person can do if he finds these symptoms in himself/herself or in any other person of the group.
3. Explain in detail as to why group can make higher quality decisions than individuals. Give Examples?
4. What Social Media communication strategy you will suggest for a person who just started a successful business venture a few years ago? And have become an inspirational figure for young entrepreneurs and for his employees.
5. Compare American, Indian and Japanese Organizational Cultures. Is Indian Organizational culture closer to Japan? Or Is it closer to American Organizational Culture? Explain with example.
6. Explain the concept of organizational change and resistance to change. What management can do to overcome such resistance?
7. What is organizational effectiveness? What approaches can be used to measure the organizational effectiveness.
8. Write a detailed note on organizational power and politics

Code: CBOS41

**Set C**

**CBOS for PG Programme (SEM-IV) EXAMINATIONS, 2019**

**LAB: Web Based Development using J2EE**

**Time: 2 Hours**

**Max Marks: 25**

- \* Attempt ANY ONE of the following questions:

1. Write a JSP program to capture user-inputs using Java Bean. The user inputs are First name, last name, Email, mobile and salary. The captured inputs should be stored to a database table.
2. Write a JSP program to define user-defined tag to print Current Time on the Server.

Write a JDBC program to take user inputs using swing GUI. The user

MCA (SEM-IV) THIRD EXAMINATIONS, 2010

CCC4042: Artificial Intelligence

Time: 1 Hour

Maximum Marks: 5

Date: April 8, 2010

- Attempt all questions.

1. (i)

$p(X) :- q(X).$   
 $p(X) :- b(X), c(X), d(X), e(X).$   
 $p(X) :- f(X).$

$a(1), b(1), \dots, e(1), f(1), d(2), e(2), f(3)$

Consider the above prolog program and answer this query for a cut-free program and the above program with cut.

?-  $p(X).$

✓ 2.

Without using cut, write a predicate split/3 that splits a list of integers into two lists: one containing the positive ones (and zero), the other containing the negative ones. For example: split([1,4,-5,1,0,4,-9],P,N) should return: P = [1,4,0,4] and N = [-5,1,-9].

Then improve this program, without changing its meaning, with the help of cut.

3. Represent the following sentences using Semantic net and Conceptual dependency.

(3)

(i) John gave a rose to Mary.  
 (ii) John is engineer and Mary is fair.  
 (iii) John ate icecream with spoon.

4. What is the need for knowledge representation methods? Define and compare the following methods:  
 Frame, Script, Ontology

(4)

M.C.A.(SEM-IV) Mid Term -II, 2019

CSC613: Big Data and Cloud Computing

Time: 60 minutes

Maximum Marks:15

Attempt any two questions. Each question carries equal marks.

1. What is virtualization? Are Cloud Computing and Virtualization Same?
2. What is Virtualization Architecture? How many Types of Virtualization, explain any one.
3. What is Hypervisor? Discuss Hypervisor-based Products and Emulation-based Products

Set I  
WCA - Semester IV Practical Examination (2019)

Maximum Marks : 10

Time: 2 Hours

Select Any Two Questions

1. Calculate the frequency of occurrence of each word.

Example:

Sample File :-

This is summer I am xyz

I am xyz

This is summer

Output for the given file:

This	2
is	2
summer	2
I	2
am	2
xyz	2

2. Take any sample text file and write a Pig script to count the number of words in the file.

3. Using Hive, create 2 tables, which should be as follows:

Table 1: employee\_data that contains employee\_id, employee\_name and employee\_gender.

Table 2: employee\_emailIDs that contains employee\_name and employee\_email  
Perform inner join, left outer join and right outer join on the created tables.

## CBCS for PG Programme (SEM-IV) EXAMINATIONS, 2019

## Web Based Development using J2EE

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
  - Attempt ALL questions by selecting any TWO parts from each question. Marks are indicated against each question.
1. (a) Write down the advantages of multi-tier Web application architecture. Explain the role of HTTP on the Web. 7.5
  - (b) Explain the following protocols with regard to its application on the Web: 7.5
    - i) HTTPPs ii) SMTP iii) POP
  - (c) What is J2EE? Explain any three J2EE best practices for user-interface design. 7.5
  2. (a) What is JDBC? Give a brief account of pure Java JDBC driver. 7.5
  - (b) Differentiate between DOM parser and SAX parser. Explain the working of DOM parser with an example. 7.5
  - (c) Suppose that Examination Branch of a university is planning to offer grade of a semester online. The necessary information related to examination such as student's enrolment, name, programme, semester, paper codes and their marks are stored in a database table. Write a Java program that accepts student's enrolment, connect to a database, and display Exam Result in a tabular form. Make necessary assumptions about database driver and assume that table schema with information already exists. 7.5
  3. (a) Explain the life cycle of the servlet with a neat diagram. Also write the benefits of Java servlets. 7.5
  - (b) What is Servlet Context? How servlets collaborate? 7.5
  - (c) What are cookies? Explain the working of cookie with a code example. 7.5
  4. (a) What are different basic constructs of JSP? Explain, how form data can be handled using Java Beans? 7.5
  - (b) What is Java Standard Tag Library (JSTL)? How would you create custom JSP tags? Explain with code example. 7.5
  - (c) Write a server-side web-application using JSP to calculate monthly electricity bill of a customer. The inputs are taken using HTML form such as consumer\_number, and number\_of\_units. The application calculates the total payable amount. The charges per unit are as per the following slab:  

Unit	Charges per unit
Upto 200	Rs 4.00
201-400	Rs 6.00
>400	Rs 8.00
  5. (a) Explain the architecture of Apache Tomcat Server? What is the role of deployment descriptor file in web-app? 7.5
  - (b) What is Enterprise Bean? Explain the types of Enterprise Beans. 7.5
  - (c) What is JAR utility? Write a short note on EJB interfaces. 7.5



**M.C.A. (SEM IV) EXAMINATIONS- 2019**  
**Artificial Intelligence and Prolog Programming**

**Time: 2 Hours****Max Marks: 75**

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.

1. (a) Explain the essence of statement "Today's A.I. systems sorely lack the essence of human intelligence: understanding the situations we experience, being able to grasp their meaning.". Express your views either against or for this statement with your justification.  
(b) Why the Turing Award is known as the most prestigious award in the field of computer science? To whom it is awarded for the year 2018 and for which contribution?  
(c) Differentiate between the ideologies supported by strong AI and weak AI. Briefly describe any fiction supporting strong AI.
2. (a) What is the importance of heuristics in the Best first search? Suggest a heuristic for solving Water-jug puzzle and evaluate it against admissibility, monotonicity, and informedness.  
(b) Explain essence of MiniMax algorithm for playing two-player games. Suggest evaluation functions for following games: Tic-Tac-Toe and Chess. Consider a game tree with depth 3 and branching factor 3 with leaf node evaluation scores as following from left to right: 8, 7, 2, 9, 1, 6, 2, 4, 1, 1, 3, 5, 3, 9, 2, 6, 5, 2, 1, 2, 3, 9, 7, 2, 16, 6, 4. Suggest the best strategy using MiniMax method. Is your strategy dependent on the order of scores? What will be best strategy if you reverse the order of score of leaf nodes?  
(c) Compare the following search strategies: Bidirectional search and A\* search, for optimality, completeness, time and space complexity.
3. (a) What is an expert system shell? Explain with 2 examples at least. Compare forward and backward chaining methods in terms of algorithm, size of knowledgebase, and usefulness.  
(b) What is semantic network? How inferencing takes place using semantic nets? Draw a semantic network for the information given below:  
 Bird is animal. Moving method of bird is to fly and it is active at day light. Kiwi is a bird. Moving method of kiwi is to walk, its color is brown and its active at night. Kim is a kiwi.  
 Represent this network using Prolog program and explain how your program will answer query:  
`?-moving_method(kiwi,Method).`  
(c) Explain the knowledge representation method for semantic web with at least 2 examples.
4. (a) Apply operator-precedence parsing to show how these expressions are valid as per declarations given below:  
`:- op (800,fx,if).`  
`:- op (700, xfx, then).`  
`:- op (300, xfy, and).`  
`:- op (200, xfy, or).`  
(i) if cond1 and cond2 then cond3.  
(ii) if cond1 or cond2 and cond3 then cond4.  
(b) Write a prolog program to do the following:  
`-print individual elements of List`  
`-split a list of numbers into 2 lists, one containing odd numbers and the other containing zero or even numbers.`  
(c) Explain the use of following operators in Prolog: cut, fail, true, unification (=). Write a prolog program using cut to find maximum out of 2 numbers.
5. (a) Compare monotonic reasoning with non-monotonic reasoning. Explain how these following methods handle reasoning under uncertainty: Unless operator, Default logic,  
(b) Show how a JTMS could be used in medical diagnosis. Consider rules such as: "If you have a runny nose, assume you have a cold unless it is allergy season."  
-Show the same medical reasoning problem with an LTMS.  
-How do the two methods JTMS and LTMS differ?  
(c) How does Bayesian rule support measure of belief? In manufacturing a product, 83% of the products that are produced are not defective. Out of the products inspected, 11% of the good ones are seen as defective and not shipped whereas only 6% of the defective products are approved and shipped. If a product is shipped, what is the probability that it is defective?

**MCA (SEM-IV) EXAMINATIONS – 2019**  
**Software Project Management With Minor Project**

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.

- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.

1. (a) How to calculate Project Cost and Time using COCOMO Model? Explain the COCOMO model with the help of examples.  
 (b) Discuss SPM framework and Objectives.  
 (c) What is Management spectrum? Explain.
2. (a) Explain PERT chart and its different terminologies.  
 (b) Explain Work Breakdown Structure (WBS) with the help of suitable examples.  
 (c) Give an example of Gantt chart and discuss.
3. (a) Explain the different types of review.  
 (b) Explain the following terms with the help of suitable examples:
  - (i) Cost Variance
  - (ii) Schedule variance
  - (iii) Cost Performance Index
 (c) Explain about the earned value analysis.
4. (a) Explain the following:
  - (i) Test Plan
  - (ii) Test Objective
  - (iii) Test Cases.
 (b) Explain the following:
  - (i) Software Quality Metrics
  - (ii) Software Quality Attributes
  - (iii) SQA Approaches.
 (c) Discuss about the proof of correctness.
5. (a) Explain the following:
  - (i) Version control
  - (ii) Change control
  - (iii) Risk break down structure
 (b) Explain about the following:
  - (i) Risk Planning
  - (ii) Risk identification
  - (iii) Risk Analysis.
 (c) Explain about the MS-Project.

## MCA (SEM-IV) EXAMINATIONS - 2019

CSCC44: Big Data Analytics and Cloud Computing

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt all questions by selecting any two parts. All questions carry equal marks.

1.  (a) What is Big Data and Big Data Problem? Discuss Various Challenges of Big Data.  
 (b) What are various characteristics of Big data? Discuss Common Big Data Customer Scenario.  
 (c) What are applications of Big Data Analytics? How does Big Data Analytics work?
2. (a) What are various types of Big Data Analytics? Explain climate change from Big Data Perspective and Climate Change specific Big Data Issues.  
 (b) What are differences between HBase and RDBMs? Describe the benefits of Big Data Analytics.  
 (c) What do you mean by Big Data Talent Gap? Discuss Getting data into the big data platform.
3.  (a) Are Cloud Computing and Virtualization same? Explain benefits of Virtualization and Virtualization in Cloud Computing  
 (b) What is virtual Machine? Discuss various types of virtualization.  
 (c) What is shared kernel? Explain Xen Virtualization Architecture, Threat Model and Virtualization Security Requirements.
4.  (a) What are various service models of Cloud Computing? Discuss Platform as a Service with suitable examples.  
 (b) What are various types of cloud deployment models? Discuss Private Cloud.  
 (c) What is Amazon Elastic Compute Cloud (EC2)? How can you create key pair and Generate a key pair with Amazon EC2.
5.  (a) How can you calculate the Availability of resources in cloud? Explain it with a suitable example.  
 (b) What is Security Policy? Discuss Tools to Document Data Security.  
 (c) What are security attacks? Discuss Scaling A cloud Infrastructure: Capacity Planning and Cloud Scale.

**MCA (SEM-IV) EXAMINATIONS - 2019**  
**Leadership, Interpersonal Skills and Group Dynamics**

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.
- 

1. (a) How does the behavioral theory of leadership different from trait theory of leadership? Which theory is more applicable in a democratic society and why?  
(b) Draw out a leadership sketch of a charismatic corporate leader/CEO.  
(c) What is emotional intelligence? Why effective leaders have higher emotional intelligence Explain with some examples.
  
2. (a) What are the various characteristics associated with effective leadership? Which of these characteristics are more important than others and why?  
(b) Compare and contrast the three leadership styles. Under what situations would each style be effective? Explain with suitable examples.  
(c) Explain in detail the personal characteristics of leaders. Are some of these characteristics inherited? If so, identify these characteristics and explain why you consider these characteristics as inherited?
  
3. (a) Explain the concept of group cohesiveness. Why would some groups be more cohesive than others? Give reasons to support your answer.  
(b) Explain in details the Physiological, Psychological and Behavioral symptoms of stress. How one should respond to these symptoms if he/she sees these symptoms in himself or herself in other member of the group.  
(c) What are the structural and situational sources of power? What steps can be taken to ensure that such power is not misused?
  
4. (a) Explain in detail as to why group can make higher quality decisions than individuals. Give examples?  
(b) Write a note on "JOHARI WINDOW". Also discuss its effectiveness in the organizations.  
(c) What Social Media communication strategy you will suggest for a person who just started a successful business venture a few year ago? And have become an inspirational figure for young entrepreneurs and for its employees.
  
5. (a) Compare American, Indian and Japanese Organizational Culture. Is Indian Organizational culture closer to Japanese Or is it closer to American Organizational Culture? Explain with examples.  
(b) Explain the concept of organizational change and resistance to change. What management can do to overcome such resistance?  
(c) What is organizational effectiveness? What approaches can be used to measure the organizational effectiveness.



**Programme Name (SEM) EXAMINATIONS - 2019**  
**CRYPTOGRAPHY AND NETWORK SECURITY**

Time: 2 Hours

Max Marks: 75

- Write your Roll No. on the top immediately on receipt of the question paper.
- Attempt ALL questions by selecting any TWO parts. All questions carry equal marks.

1. (a) List and define five security services. Discuss some security mechanisms to provide these security services.  
 (b) Decrypt the following message which is encrypted using Playfair code, the key used is "her majesty": YSFKP RNLML VRKTL RKNJS TKEGS.  
 (c) Describe the role of Fiestel cipher in the DES encryption with appropriate diagram. Also explain Key Scheduling in DES using a diagram.
  
2. (a) State the Finite Field theorem. Define prime as well as extension fields respectively. Also define the prime field arithmetic scheme.  
 (b) Show polynomial arithmetic over GF(2<sup>3</sup>), for inputs (1,0,1) and (1,1,1) ∈ GF(2) respectively, given A(x) = a<sub>2</sub>x<sup>2</sup> + a<sub>1</sub>x + a<sub>0</sub>, use irreducible polynomial P(x) = x<sup>3</sup> + x + 1 where necessary.  
 (c) Define the Chinese Remainder Theorem. Use it to solve the following set of congruence relations:  

$$x \equiv 3 \pmod{5}; x \equiv 4 \pmod{7}; x \equiv 2 \pmod{3}$$
  
3. (a) How is key generation different in RSA than in Symmetric Algorithms? State the steps of key generation and describe the process of encryption and decryption in RSA.  
 (b) Explain the role of cyclic groups in building Diffie Hellman Key Exchange algorithm. Discuss why is it secure in terms of Discrete Logarithmic Problem.  
 (c) What is an Elliptic curve? Describe the group  $Z_p$  and the operations that can be performed on its elements to implement elliptic curve cryptography.
  
4. (a) Discuss the role of hash functions in security service scheme. Deliberate on functional requirements for building hash functions and discuss what security measure can be taken to avoid weak as well as strong collisions.  
 (b) What is Message Authentication Code? Discuss its properties.  
 (c) Describe underlying principles of Kerberos using example of how Alice can communicate with Bob over an unsecure channel.
  
5. (a) What are typical phases of operation of a virus or worm?  
 (b) What is a digital immune system approach?  
 (c) What is a DDoS?

