

**End Semester Examination, Dec. 2023**  
**BCA - Third Semester**  
**OBJECT ORIENTED PROGRAMMING USING C++**  
**(BCA-DS-301/BCA-302A (CB))**

Time: 3 hrs.

Max Marks: **100**

*No. of pages: 1*

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) What is the purpose of a compiler in program execution? [CO-3] [L-1]
- b) Differentiate between 'class and object'. [CO-2] [L-2]
- c) What is dynamic initialization of variables? [CO-5] [L-2]
- d) What is an inline function? [CO-3] [L-2]
- e) Name the three access specifiers in C++. [CO-2] [L-1]
- f) Can you pass object as a function argument in C++? [CO-3] [L-2]
- g) What is the purpose of a destructor in C++? [CO-3] [L-1]
- h) Which type of access specifier is used in inheritance? [CO-2] [L-2]
- i) What is a virtual function I C++? [CO-2] [L-1]
- j) What are formatted console I/O operations? [CO-5] [L-1] **2x10**

**PART-A**

- Q.2 a) Give the comparison of procedural programming and object-oriented programming. [CO-2] [L-2] **5**
- b) Differentiate between compiler and interpreter. [CO-2] [L-2] **5**
- c) Write down specific features of object-oriented programming [CO-2] [L-1] **10**
- Q.3 a) What are the different looping statements in C++? Explain in detail. [CO-2] [L-2] **10**
- b) Write down the operators used in C++ in detail. [CO-3] [L-2] **10**
- Q.4 a) Define array. Write a C++ code to search an element in an array. [CO-3] [L-3] **10**
- b) What do you understand by an array of objects? Explain with an example. [CO-2] [L-2] **10**

**PART-B**

- Q.5 a) What is a constructor? Why constructor is preferred? Also, by what way we can destroy the constructor? [CO-3] [L-2] **10**
- b) Write a C++ code to print the sum of 5 elements using constructor. [CO3][L3] **10**
- Q.6 a) What is polymorphism? Write down C++ code to justify this concept. [CO-2] [L-2] **12**
- b) Explain memory management in C++ specifying new and delete operator. [CO-3] [L-2] **8**
- Q.7 a) What is exception? What is the mechanism to handle the exceptions in C++? [CO-5] [L-2] **10**

b) Differentiate between unformatted and formatted console I/O operations  
[CO-4] [L-3] **10**

**End Semester Examination, Dec. 2023**  
 BCA – First Semester  
**ELEMENTS OF MATHEMATICS**  
**(BCA-DS-101/BCA-102A (CB)/BCA-102(CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 a) If  $A = \begin{bmatrix} -2 & 8 \\ 3 & 6 \end{bmatrix}$  and  $B = \begin{bmatrix} -3 & 1 \\ 4 & 3 \end{bmatrix}$  find A-B [CO3][L2]
- b) Define Triangular matrix. [CO2][L2]
- c) If  $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$  then the value of x \_\_\_ [CO4][L2]
- d) Value of  $\tan 45^\circ / \cot 45^\circ$  is: [CO3][L2]  
 i)  $1/\sqrt{2}$                       ii)  $1/\sqrt{3}$                       iii)  $\sqrt{3}$                       iv) 1
- e) Evaluate  $30!/28!$  [CO2][L2]  
 i) 970                      ii) 870                      iii) 770                      iv) 670
- f) In how many words can be formed by using all letters of the word NUMBERS [CO3][L2]  
 i) 4200                      ii) 5200                      iii) 5040                      iv) 7200
- g)  $(\tan 45^\circ + \cos 30^\circ) - (\cos 30^\circ + \cot 45^\circ)$  [CO4][L2]  
 i) -1                      ii) 0                      iii) 1                      iv) 2
- h) The fourth term in the expansion  $(x - 2y)^{12}$  is. [CO3][L2]  
 i)  $-1670 x^9 \times y^3$     ii)  $-7160 x^9 \times y^3$     iii)  $-1760 x^9 \times y^3$     iv)  $-1607 x^9 \times y^3$
- i) Construct  $3 \times 3$  matrix whose elements are given by  $a_{ij} = [i-j]$  [CO3][L1]
- j) If  $A = \begin{bmatrix} -3 & 7 \\ 3 & 5 \end{bmatrix}$ . Find  $A^{-1}$  [CO2][L2] **2×10**

**PART-A**

- Q.2 a) Solve by Cramer's Rule  $\begin{cases} 2x - y - 4z = 8 \\ 3x + 2y = 1 \\ x + y = 1 \end{cases}$  [CO3][L3] **10**
- b) If  $A = \begin{bmatrix} 0 & 1 & 2 \\ -1 & 3 & 2 \\ 2 & 8 & 3 \end{bmatrix}$ . Find  $A^{-1}$  [CO2][L3] **10**
- Q.3 a) Out of 6 boys and 4 girls, a committee of 6 is to be formed. In how many ways this can be done if the committee contains [CO2][L3] **10**  
 i) Exactly 3 girls  
 ii) At least two girls
- b) Find the middle terms in the expansion of  $\left(x^2 - \frac{2}{x}\right)^9$  [CO3][L3] **10**
- Q.4 a) Find the value of  $\frac{\log \sqrt{27} + \log \sqrt{8} - \log \sqrt{125}}{\log 6 - \log 5} = \frac{3}{2}$  [CO2][L3] **10**

b) Show that  $\frac{3 \cdot 2^{n+1} + 2^n}{2^{n+2} - 2^{n-1}} = 2$  [CO2][L3] **10**

**PART-B**

Q.5 a) Prove that  $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$  [CO4][L3] **10**

b) Prove that  $\frac{\sin(A-B)}{\cos A \cos B} + \frac{\sin(B-C)}{\cos B \cos C} + \frac{\sin(C-A)}{\cos C \cos A} = 0$  [CO4][L3] **10**

Q.6 a) If  $y = x + \frac{1}{\sqrt{x}}$ , show that  $2x \frac{dy}{dx} + y = 2\sqrt{x}$  [CO4][L3] **10**

b) Differentiate w.r.t x  $\frac{2x+3}{x^2-5}$  [CO4][L3] **10**

Q.7 Expand  $\sin x$  and  $\cos x$  in powers of  $x$  by maclaurin's theorem. [CO5][L3] **20**

**End Semester Examination, Dec. 2023**  
**BCA – First Semester**  
**HARDWARE INTERFACES (BCA-DS-102 / BCA-103A (CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: **1**

*Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.*

Q.1 Answer in brief:

- |                     |                        |
|---------------------|------------------------|
| a) Bot.             | [CO-4][L1]             |
| b) Over clocking.   | [CO-5][L1]             |
| c) Need of adaptor. | [CO-1][L1]             |
| d) Antivirus.       | [CO-1][L1]             |
| e) Virus.           | [CO-5][L1]             |
| f) L1 cache.        | [CO-5][L1]             |
| g) Expansion Card.  | [CO-1][L1]             |
| h) DMP.             | [CO-1][L1]             |
| i) Mini Computer.   | [CO-1][L1]             |
| j) SSD.             | [CO-1][L1] <b>2×10</b> |

**PART-A**

Q.2 What is the role of motherboard in a computer? List the different components embedded on motherboard and their role. [CO2 L1] **20**

Q.3 a) Differentiate between the serial port and parallel port. [CO1 L4] **7**

b) Differentiate between the super controller and keyboard controller. [CO1 L4] **7**

c) Explain the working of daisy-wheel printer. [CO1 L2] **6**

Q.4 a) Explain the data storage principles of HDD, SSD, compact disk. [CO4 L2] **10**

b) What is the usefulness of cache memory in computer and how many types of cache memory is there in computer? [CO4 L1] **10**

**PART-B**

Q.5 a) Explain the POST sequence and also give list of different beeps and meaning of Beeps during POST. [CO2 L2] **15**

b) What do you mean by an SMPS in computer? [CO1 L1] **5**

- Q.6 a) "The PCI is faster than ISA". Justify the given statement with the help of a relevant examples. [CO1 L5] **10**  
b) Explain the usefulness of SCSI. [CO1 L1] **10**
- Q.7 What are the different types of malware? Why ransomware has become a prominent threat these days? Explain the working of ransomware in detail along with examples. [CO5 L1] **20**

**End Semester Examination, Dec. 2023**  
BCA – First Semester  
**INTRODUCTION TO IT AND PROGRAMMING IN C**  
**(BCA-DS-104/ BCA-106(CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

- a) What is the output of this statement "printf("%d", (a++))"? [CO1] [L1]  
i) The value of (a + 1)                      ii) The current value of a  
iii) Error message                              iv) Garbage
- b) Why is a macro used in place of a function? [CO2][L2]  
i) It reduces execution time.                      ii) It reduces code size.  
iii) It increases execution time.                      iv) It increases code size.
- c) What will the result of num1 variable after execution of the following statements? [CO2][L2]  
int j = 1, num1 = 4;  
while (++j <= 10)  
{  
    num1++;  
}  
i) 11                      ii) 12                      iii) 13                      iv) 14
- d) To access the members of structure which symbol is used? [CO-4][L-1]  
i) \*                      ii) .                      iii) ,                      iv) None of these
- e) The 2's complement of a binary no. is obtained by adding.....to its 1's complement. [CO-2][L-2]  
i) 0                      ii) 1                      iii) 10                      iv) 12
- f) \_\_\_\_\_ keyword can be used for coming out of recursion [CO-1][L-1]  
i) break                      ii) return  
iii) exit                      iv) both break and return
- g) Suppose that cPtr is a character pointer, and its current content is 300. What will be the new value in cPtr after the following assignment? [CO2][L2]  
cPtr = cPtr + 5;  
i) 305                      ii) 310                      iii) 320                      iv) 340
- h) The format identifier '%i' is also used for \_\_\_\_\_ data type. [CO-4][L-2]  
i) char                      ii) int                      iii) float                      iv) double
- i) What will be the output of the following C code? [CO-5][L-1]  
#include <stdio.h>  
int x = 0;  
void main()  
{ int \*ptr = &x;  
  printf("%p\n", ptr);  
  x++;  
  printf("%p\n ", ptr);}  
i) Same address                      ii) Different address  
iii) Compile time error                      iv) Varies
- j) The keyword 'break' cannot be simply used within \_\_\_\_\_  
i) do-while                      ii) if-else                      iii) for                      iv) while

**P. T. O**

**PART-A**

- Q.2 Write short notes on:
- Input devices.
  - Social media tools.
  - Interpreter.
  - Characteristics of computers. [CO-2][L-2] 5×4
- Q.3
- Explain the different types of preprocessor directives with suitable example. [CO-1][L-2] 10
  - Explain the various type of data types used in C language. Illustrate with the use of suitable example [CO-1][L-2] 10
- Q.4
- Differentiate between for and do-while loop. [CO-5][L-3] 5
  - Write a program to find the factorial of a number entered by the user. [CO-5][L-3] 5
  - What is the role of the switch Statement? Write a program to determine the weekday corresponding to the number entered by the user using a switch-case. [CO-4][L-3s] 10

**PART-B**

- Q.5
- What is a two-dimensional array? Create a program for the multiplication of two matrices. [CO-4][L-6] 10
  - C supports a large number of String handling functions. Define the most commonly used string manipulation function and illustrate their use with the help of suitable program. [CO-1][L-1] 10
- Q.6 Write short notes on:
- Call-by-value.
  - Call-by-reference.
  - Recursion.
  - Sharing variables between functions. [CO-4][L-2] 5×4
- Q.7
- Illustrate the use of 'pointers' in C. List out there the advantages. [CO-1,5][L-2] 4
  - What is the requirement of structure? Create a structure of a student which is having student id, student name, address, and phone no as the member function. Write a program to display the details of five students. [CO5][L-2] 10
  - Write short notes on:
    - Passing entire structure to function.
    - Structure within structure. [CO-4][L-2] 6



# End Semester Examination, Dec. 2023

BCA – First Semester

## DATABASE MANAGEMENT SYSTEM (BCA-DS-105/ BCA-204A (CB))

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1
- a) Compare relational algebra and relational calculus. [CO1][L2]
  - b) Give the full form of SQL. [CO4][L1]
  - c) What do you understand by redundancy? [CO1][L2]
  - d) Write two disadvantages of DBMS. [CO1][L1]
  - e) What is full form of RDBMS? [CO1][L1]
  - f) What is meant by DBA? [CO2][L1]
  - g) What is data model? [CO1][L1]
  - h) What is entity? [CO1][L1]
  - i) What is functional dependency? [CO5][L1]
  - j) What is not null constraint? [CO1][L1] **2×10**

### **PART-A**

- Q.2 What do you understand by Entity? Design an ER Diagram for a Hospital with a set of patients and a set of medical Doctors. Associate with each patient, a log of various tests and examinations conducted. [CO1][L4] **20**
- Q.3 What is DBMS? Discuss the features and architecture of a DBMS. [CO2][L2] **20**
- Q.4 Write the syntax, purpose and example of the following:
- a) Delete
  - b) Like
  - c) Joins
  - d) Alter
  - e) Update
- [CO4][L2] **4×5**

### **PART-B**

- Q.5 What is Normalization? Outline the objectives of Normalization. Describe 1NF, 2NF and 3NF with suitable example. [CO5][L3] **20**
- Q.6 Write short note on the following:
- a) Data base recovery.
  - b) Distributed databases.
- [CO3][L2] **10×2**
- Q.7 Discuss the concurrency and summarize the various possible problems associated with it in DBMS. Discuss various concurrency control techniques through suitable examples. [CO6][L3] **20**

**End Semester Examination, Dec. 2023**  
 BCA - First Semester  
**BUSINESS COMMUNICATION (BCA-DS-106)**

Time: 2 hrs.

Max Marks: **50**  
 No. of pages: 5

**Please read the instructions carefully**

Note: All questions are **compulsory**. Each question has **FOUR** options with **ONE** correct answer. Select the correct answer. All questions are of **ONE** mark each. There is no **NEGATIVE** marking. Mention the correct option for each question in the blank answer key given herein below. Calculator is not permitted. Use only black or blue pen.

Answer Table:

Q.1	Q.2.	Q.3.	Q.4.	Q.5.	Q.6.	Q.7.	Q.8.	Q.9.	Q.10.
Q.11.	Q.12.	Q.13.	Q.14.	Q.15.	Q.16.	Q.17.	Q.18.	Q.19.	Q.20.
Q.21.	Q.22.	Q.23.	Q.24.	Q.25.	Q.26.	Q.27.	Q.28.	Q.29.	Q.30.
Q.31.	Q.32.	Q.33.	Q.34.	Q.35.	Q.36.	Q.37.	Q.38.	Q.39.	Q.40.
Q.41.	Q.42.	Q.43.	Q.44.	Q.45.	Q.46.	Q.47.	Q.48.	Q.49.	Q.50.

- Q.1 Simplify:  $23 \times 4 + 2(20 + 15) / 10$   
 A] 99                                      B] 80                                      C] 100                                      D] 80
- Q.2 For what minimum value of x, the number 725x59259 is divisible by 11?  
 A] 0    B] 1    C] 2    D] 3
- Q.3 The average of runs of a cricket player of 15 innings was 32. How many runs must he make in his next 2 innings combined together so as to increase his average of runs by 4?  
 A] 146    B] 173    C] 182    D] 132
- Q.4 What is the remainder for the following expression:  $3^{58}/28$   
 A] 14    B] 17    C] 25    D] 11
- Q.5 There are 5 students A, B, C, D and E whose marks are in an increasing AP. The ratio of 4<sup>th</sup> highest marks to the lowest is 5:2 and ratio of 4<sup>th</sup> highest marks to middle term of AP is 5:4. Find the highest marks.  
 A] 50    B] 60    C] 40    D] 55
- Q.6 The average of 10 consecutive numbers is 15.5 then the largest of these numbers is:  
 A] 21    B] 22    C] 23    D] 20
- Q.7 What is the remainder for the following expression:  $2^{30}/6$ ?  
 A] 2    B] 4    C] 1    D] 5
- Q.8 Sahil travels 10 km towards east and then 6km towards her right. Then, he turns towards east direction and travels 2 km. Finally, he travels 6 km towards north. How far is he from the starting point?  
 A] 10 km    B] 12 km    C] 14 km    D] 15 km

- Q.9 After striking a floor, a ball bounces back to  $\frac{5}{8}$ th of its previous height, find the distance it travels before coming to rest. Initially the ball was dropped from a height of 300 m.  
 A] 1940 m                      B] 1360 m                      C] 1280 m                      D] 1300 m
- Q.10 What is the unit digit of the following expression:  $122^{96} \times 11^{101} \times 22^{104} \times 133^{200}$ .  
 A] 6                                  B] 3                                  C] 1                                  D] 2
- Q.11 What is the unit digit of the following expression:  $23^{24} \times 24^{25} \times 25^{26} \times 26^{27} \times 27^{28}$ .  
 A] 5                                  B] 0                                  C] 2                                  D] 3
- Q.12 Sahil travels a certain distance at an average speed of 60 km/h without any stoppage, and with stoppages he covers the same distance at an average speed of 45 km/h. How many minutes per hour does he stop?  
 A] 15 minutes                      B] 20 minutes                      C] 18 minutes                      D] 22 minutes
- Q.13 A is the brother of B. A is the brother of C. To find what is the relation between A and C. What minimum information from the following is necessary?  
 I. Gender of C                      II. Gender of B  
 A] Only [I]                              B] Only [II]                              C] Either [I] or [II]                      D] [I] and [II] both
- Q.14 K is 30 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K?  
 A] East                                  B] West                                  C] North-East                      D] South
- Q.15 A virus gives birth to three new viruses in each second and the life span of each virus is 5 seconds. The process of the reproduction is continuous until the death of the virus. Initially there is one newly born virus at time  $t = 0$ , then find the total number of live virus just after 10 seconds:  
 A]  $1023 \times 1024$                       B]  $1024 \times 1025$                       C]  $1023 (4^5 - 1)$                       D]  $1024 (4^6 - 1)$
- Q.16 There are 30 people in a team and their average weight is 54kg. 2 more people joined in the team and the average change is as follows. When the first person joined in, the average weight increased by 1 kg and when the 2<sup>nd</sup> person joined in the average weight again got increased by 1kg. What is the ratio of weight of the 2 people.  
 A] 85:87                                  B] 85:86                                  C] 83:85                                  D] 8:3
- Q.17 What is the number of trailing zeroes for  $323!$   
 A] 56                                  B] 53                                  C] 71                                  D] 78
- Q.18 The average of six numbers is 9.99. The average of two of them is 2.22, while the average of the other two is 4.44. What is the average of the remaining two numbers?  
 A] 23.61                                  B] 24.26                                  C] 26.25                                  D] 23.31
- Q.19 A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to D?  
 A] Father                                  B] Brother                                  C] Grandfather                      D] Uncle

- Q.20 What are the total number of factors for the number: 2970.  
 A] 46                      B] 42                      C] 48                      D] 44
- Q.21 Find the sum of first 20 terms of the AP 12,17,22,29.  
 A] 1140                      B] 1130                      C] 1120                      D] 1190
- Q.22 Three number are in the ratio of 6 : 7 : 8 and their L.C.M. is 672. Their H.C.F. is:  
 A] 4                      B] 8                      C] 7                      D] 3
- Q.23 Sahil receives Rs.1500 as salary for 1st week and 2<sup>nd</sup> week. He gets Rs50 more in 3<sup>rd</sup> and 4<sup>th</sup> week and again Rs50 more for 5<sup>th</sup> and 6<sup>th</sup> week and the trend continues. How much does he earn by the 20th week?  
 A] 34,500                      B] 35,500                      C] 36,500                      D] 31,900
- Q.24 A rectangular courtyard 4.20 meters long 5.60 meters wide is to be paved exactly with square tiles, all of the same size. What is the largest size of the tile which could be used for the purpose?  
 A] 140 cms                      B] 210 cms                      C] 420 cms                      D] None of these
- Q.25 The average temperature of the town in the first five days of a month was 60 degrees. The average for the second, third, fourth, fifth and sixth days was 64 degrees. If the temperatures of the first and sixth days were in the ratio 7 : 5, then what is the temperature on the sixth day ?  
 A] 52 degrees                      B] 54 degrees                      C] 50 degrees                      D] 56 degrees
- Q.26 If  $\log 2 = 0.4010$  and  $\log 3 = 0.5771$ , the values of  $\log_5 512$  is:  
 A] 6.875                      B] 6.02                      C] 6.875                      D] 6.875
- Q.27 The sum of the first 20 terms of an AP whose fifth term and sixth term are 30 and 35 respectively is:  
 A] 1150                      B] 1765                      C] 1640                      D] 1680
- Q.28 If  $\log 256 = 1.8061$ , then the value of  $\log 32$  will be (approx.)?  
 A] 1.1048                      B] 1.1040                      C] 1.1128                      D] 1.4521
- Q.29 In a row of boys, If A who is 20th from the left and B who is 10th from the right interchange their positions, A becomes 31st from the left. How many boys are there in the row?  
 A] 40                      B] 31                      C] 27                      D] 28
- Q.30 There are 100 students of a class standing in a row. Ayush is at 40<sup>th</sup> position from left end and Sahil is 29<sup>th</sup> from the other end. If both Ayush and Sahil's, best friend Prachi is standing between them and she is equidistant from both Ayush and Sahil, find the position of Prachi from left end.  
 A] 56                      B] 55                      C] 57                      D] 58
- Q.31 How many syllables does ***bedtime*** have?



- Q.43 The purpose of storytelling is to:  
A] to scold                      B] to persuade                      C] to praise                      D] to inquiry
- Q.44 What is the mistake to be avoided in speaking?  
A] Using easy language                      B] Knowing the purpose of speaking  
C] Correct pronunciation                      D] Rambling
- Q.45 Complete the sentence: ..... refers to the attitude or emotional expression conveyed in written or spoken language.  
A] Tone                      B] Pitch                      C] Pause                      D] Rate of speech
- Q.46 The non-verbal communication cues and signals that people use to convey information, feelings, and intentions through their physical movements and gestures is called.....  
A] Speaking                      B] Writing                      C] Reading                      D] Body language
- Q.47 How can we improve vocabulary?  
A] Learn a Word a Day                      B] Read in English  
C] Play Word Games                      D] All of the above
- Q.48 Choose the correct option: A ..... is a concise and structured document that provides an overview of a person's education, work experience, skills, and qualifications.  
A] Paragraph                      B] Story                      C] Resume                      D] Essay
- Q.49 Choose the correct option for: A ..... is a structured and moderated conversation or discourse involving multiple individuals, typically ranging from a small group to a larger gathering, where participants express their opinions, ideas, and perspectives on a specific topic or issue.  
A] Debate                      B] Speech                      C] Extempore                      D] Group discussion
- Q.50 Which one of following to be taken care for Group discussion?  
A] Actively Listen                      B] Prepare                      C] Purpose                      D] All of above

**End Semester Examination, Dec. 2023**  
BCA – Third Semester  
**INTRODUCTION TO OPERATING SYSTEM**  
**(BCA-DS-302/ BCA-303 (CB) / BCA-303A (CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Mention any two benefits of multiprogramming.
- b) What are the major tasks of a resource administrator?
- c) What is the function of a scheduler?
- d) What are the scheduling algorithms? Write the names of the algorithms?
- e) Discuss the concept of memory allocation.
- f) Explain the use of password.
- g) What is the purpose of the device driver?
- h) Define 'round robin method'.
- i) What is meant by deadlock?
- j) List any two page removal algorithms.

[CO1,3,4][L1,2] **2×10**

**PART-A**

Q.2 Discuss the progression of operating system. Briefly explain the different types of operating systems are there? [CO1][L1,2,3] **20**

Q.3 Draw Gantt chart for the CPU schedule under FCFS, SJF, Priority, Round robin algorithms (Time Quantum = 5) for the following ready queue:

Processes:	P1	P2	P3	P4	P5
CPU bursts:	15	5	13	8	11
Priority:	3	5	7	4	6

Also compute average turnaround time and average waiting time.

[CO2][L1,3] **20**

Q.4 Suppose there are 3 copies of resource A, 4 copies of resource B, and 4 copies of resource C. Suppose further that process 1 holds one unit of resources B and C and is waiting for a unit of A; that process 2 is holding a unit of A and waiting on a unit of B; and that process 3 is holding one unit of A, two units of B, and one unit of C. Draw the resource allocation graph. Is the system in a deadlocked state? Why or why not?

[CO3][L3,4] **20**

**PART-B**

Q.5 Compare and contrast:

- i) Internal and external fragmentation.
- ii) Logical and physical address space.

[CO4][L1,2,3] **10×2**

Q.6 Explain the steps required to perform page replacement. Explain the different page replacement policies. List out main requirements, which should be satisfied by a page replacement policy. [CO5][L3,4] **20**

Q.7 Define 'file system'. Illustrate through examples.

[CO5][L3] **20**

**End Semester Examination, Dec. 2023**  
BCA – Third Semester  
**MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE**  
**(BCA-DS-303/BCA-401A (CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

- a) Which term refers to the size or "count" of elements in a set? [CO-1] [L-3]  
i) Set equivalence ii) Set complement  
iii) Set cardinality iv) Set intersection
- b) Euclidean algorithm is used for \_\_\_\_\_. [CO-2][L-2]  
i) To find LCM ii) to find GCD iii) to find the root iv) None of these
- c) The Pigeonhole Principle is primarily used to prove the existence of what? [CO-3][L-2]  
i) Large prime numbers ii)  
iii) Divisible numbers iv) Identical objects in distinct containers
- d) What type of algebraic structure is defined by a set equipped with two binary operations, meet ( $\wedge$ ) and join ( $\vee$ )? [CO-2][L-2]  
i) Groups ii) Lattices iii) Rings iv) Fields
- e) What is the order of a recurrence relation? [CO-3][L-3]  
i) The highest power of the dependent variable in the equation  
ii) The highest power of the independent variable in the equation  
iii) Number of terms in the equation  
iv) The degree of the difference equation
- f) In coordinate geometry, what is the equation of a straight line in the point-slope form? [CO-2][L-1]  
i)  $y = mx + c$  ii)  $y = a$   
iii)  $x = a$  iv)  $(x - x_1)/(x_2 - x_1) = (y - y_1)/(y_2 - y_1)$
- g) What type of graph has every pair of distinct vertices connected by a unique edge? [CO-3][L-2]  
i) Bipartite graph ii) Directed graph iii) Complete graph iv) Tree
- h) Which of the following is an example of a Boolean function representation? [CO-3][L-2]  
i) Polynomial form ii) Radical form  
iii) Exponential form iv) Fractional form
- i) What is the condition for three lines to be concurrent in a plane? [CO-4][L-3]  
i) They have the same slope  
ii) Their equations have no common solution.  
iii) They pass through the same point.  
iv) They have different slopes.
- j) What is the minimum spanning tree of a graph? [CO-4][L-3]  
i) The tree with the minimum number of vertices.  
ii) The tree with the minimum number of edges.  
iii) The tree with the minimum sum of edge weights.  
iv) The tree with the maximum number of vertices. **2×10**

**PART-A**

- Q.2 a) Define the cardinality of a set and explain how it is used to compare the sizes of different sets. Provide an example. [CO-2][L-4] **10**

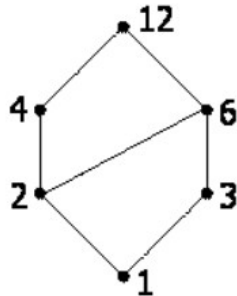


- b) Given two sets  $A = \{1, 2, 3, 4, 5\}$  and  $B = \{3, 4, 5, 6, 7\}$ , find the cardinality of their union, intersection, and set difference ( $A - B$ ). [CO-2][L-5] **10**

- Q.3 a) Explain the principles of mathematical induction (PMI) and its role in proving statements about natural numbers. Provide an example of a proof using PMI. [CO-3][L-3] **10**

- b) Use the Euclidean Algorithm to find the greatest common divisor (GCD) of two numbers: 48 and 18. Show all steps of the algorithm. [CO-3][L-5] **10**

- Q.4 Consider the Hasse diagram shown below, representing a partially ordered set (poset):



- a) Determine whether the given Hasse diagram represents a lattice or not. Explain your reasoning and provide the definition of a lattice. [CO-1][L-4] **10**
- b) If the given diagram is a lattice, find the least upper bound (LUB) and greatest lower bound (GLB) for the elements D and F, if they exist. If it is not a lattice, explain why. [CO-1][L-5] **10**

### **PART-B**

- Q.5 a) Define what a recurrence relation is and provide an example. Explain the difference between the order of a recurrence relation and the degree of the corresponding difference equation. [CO-5][L-3] **10**

- b) Solve the following linear homogeneous recurrence relation with constant coefficients using the characteristic equation method

$$a_n - 4a_{n-1} + 4a_{n-2} = 0$$

- Provide the general solution. [CO-4][L-4] **10**

- Q.6 a) Explain what the "normal form" of the equation of a straight line is in coordinate geometry. Provide an example and demonstrate how to convert the equation of a line into normal form. [CO-3][L-5] **10**

- b) Given three lines with equations:

$$2x - 3y + 1 = 0$$

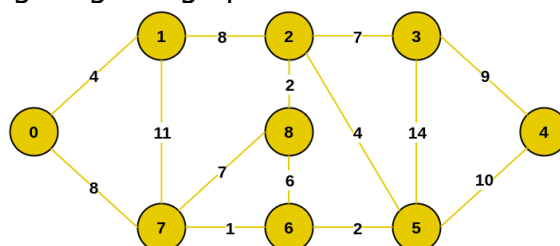
$$4x + 5y - 2 = 0$$

$$6x - 7y - 3 = 0$$

- Determine if they are concurrent (meet at a common point). Explain your reasoning. [CO-3][L-3] **10**

- Q.7 a) Define a minimum spanning tree (MST) in graph theory and explain its significance. Describe Prim's algorithm for finding the MST of a weighted graph. [CO-5][L-4] **10**

- b) Given the following weighted graph:



- Use Prim's algorithm to find the minimum spanning tree (MST) starting from vertex A. Show the steps and the final MST. [CO-4][L-5] **10**

# End Semester Examination, Dec. 2023

BCA – Third Semester

## WEB APPLICATIONS DEVELOPMENT (BCA-DS-304/BCA-304A (CB))

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Why is Java and JavaScript similar?
  - i) JavaScript is a stripped-down version of java
  - ii) JavaScript's syntax is loosely based on java's
  - iii) They both originated on the island of java
  - iv) None of the above
- b) How can you make bulleted list with numbers?
  - i) <dl>
  - ii) <OL>
  - iii) <list>
  - iv) <ul>
- c) Choose the correct HTML tag for largest heading:
  - i) <h1>
  - ii) <head>
  - iii) <heading>
  - iv) <h6>
- d) What is the correct element for making a checkbox?
  - i) <check>
  - ii) <checkbox>
  - iii) <input type = check>
  - iv) <input type = checkbox>
- e) \_\_\_\_\_ JavaScript is also called client-side JavaScript.
  - i) Microsoft
  - ii) Navigator
  - iii) Live Wire
  - iv) Native
- f) Write the name of browsers that supports HTML5?
- g) Why are variable used in JavaScript programs?
  - i) Storing numbers, dates, or other values
  - ii) Varying randomly
  - iii) Causing high-school algebra flashbacks
  - iv) None of the above
- h) What CSS define in HTML?
  - i) How to save HTML elements
  - ii) How to send HTML elements
  - iii) How to made HTML elements
  - iv) How to display HTML elements
- i) Which HTML attribute is used to define inline styles?
  - i) Class
  - ii) Styles
  - iii) Style
  - d) Font
- j) Is CSS Case Sensitive? (Write Yes or No) [CO-1,2,3,4,5] [L-2] **2×10**

### **PART-A**

- Q.2 a) Explain the points which should be considered for planning a website. [CO1][L-2] **10**  
b) Email is emerging as one of the most valuable services on the internet today. Illustrate how it works and explain its architecture too. [CO-1][L-2] **10**

Q.3 Assemble HTML tags used to get following output? What is the use of border, width and cell padding attributes used in the table?

	Time Table		
	SEMESTER II	SEMESTER IV	SEMESTER VI
Monday	Computer programming	Microprocessor	Computer Graphics
Tuesday	Computer programming	UML	Security

[CO-3][L-4] **20**

- Q.4 a) Write HTML code that displays three hyperlinks to different websites. The websites should open in a new window when the user clicks on the hyperlinks. [CO2][L-3] **10**
- b) Design HTML code as per given instructions: Place your college name at the top of the page in large text followed by address in smaller size add names of courses offered each in a different color, style and typeface add scrolling text with a message of your choice Add college image at the bottom. [CO-2] [L-4] **10**

**PART-B**

- Q.5 Build a form to collect details of a user such as name, address, radio button to choose subject of book he wants to buy, Dropdown to choose favorite author, comments for the last book he read. What is the use of <fieldset>? [CO-3] [L-3] **20**
- Q.6 Why CSS is used for Web pages? Explain the different types of CSS used in Web development. [CO-5] [L-2] **20**
- Q.7 a) What is operator? Explain different types of operators which are used in java script? [CO-4] [L-1] **10**
- b) Differentiate between server side and client-side scripting languages. Write HTML and JavaScript to take input for login name, password, birthdate, email address, phone no. and validate them. [CO-3,4] [L-3] **10**

# End Semester Examination, Dec. 2023

B. Tech. – Third Semester

## SHELL PROGRAMMING (BCA-DS-306)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Write the purpose and use of following commands with their syntax and example.

- a) wc
- b) ls
- c) cat
- d) pwd
- e) grep
- f) head
- g) cp
- h) chown
- i) rm
- j) cd

[CO-1] [L-2] **2x10**

### **PART-A**

- Q.2 a) Illustrate with a diagram the architecture of Linux. [CO-2] [L-2] **10**  
b) Define features and distribution of Linux Operating system. [CO-2] [L-2] **10**

- Q.3 a) What are the different ways of setting file permissions? [CO-4] [L-2] **10**  
b) Explain file oriented and directory-oriented commands with syntax. [CO-3] [L-3] **10**

- Q.4 a) Briefly explain basic regular expression with respect to various options available with grep command. [CO-3] [L-3] **10**  
b) Explain Linux file system in detail with its structure. [CO-4] [L-2] **10**

### **PART-B**

- Q.5 a) What do you understand by background process? What are the advantages and disadvantages of running a process in background. [CO-4] [L-3] **10**  
b) Explain about the features of Korn shell. [CO-4] [L-2] **10**

- Q.6 a) Explain available shells under Linux in detail. [CO-5] [L-2] **10**  
b) List and explain the different modes of Vi editor. Also explain different ways of quitting Vi editor. [CO-5] [L-3] **10**

- Q.7 a) Write a shell script that accepts a number from user and prints the factorial of a number. [CO-5] [L-4] **10**  
b) Explain conditional statements in Unix with suitable examples. [CO-5] [L-2] **10**

# End Semester Examination, December 2023

BCA – First Semester

## PRINCIPLES OF MANAGEMENT

(BCA-DS-307/BCA(001A(CB))/BCA(001(CB)))

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **Part-A** and **TWO** questions from **Part-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Can management be considered a profession? Give reasons.
- b) Differentiate between Authority and Responsibilities.
- c) Explain any four types of Leadership.
- d) Explain the levels of management.
- e) "Directing is a part of Controlling." Comment on the given statement.
- f) Explain the 'Division Labor'.
- g) Explain 'Job Evaluation'.
- h) Explain 'Team Management
- i) Discuss in brief the various steps in Recruiting process.
- j) Enlist any five roles of a Manager.

**2x10**

### **PART-A**

Q.2 What is the process of selecting human resources? Discuss the various types of methods of selection. What procedures should be followed to retain the talent in the organization? **20**

Q.3 a) Differentiate between the following:

- i) Job Analysis and Job Evaluation.
- ii) Formal organization and informal organization.

**10**

b) Explain in detail, the importance of Directing in the present Indian Business environment **10**

Q.4 a) Explain in brief the two approaches in which the hierarchy of objectives can be explained. **10**

b) What is departmentation? Describe the various bases for departmentation. **10**

### **PART-B**

Q.5 Write short notes on (any four) of the following:

- a) PERT.
- b) CPM.
- c) Gantt Chart.
- d) Entrepreneurship.
- e) Team Building.

**5x4**

Q.6 a) Bring out the factors affecting centralization/decentralization. Also, highlight the merits and demerits of centralization and decentralization with examples. **10**

b) What is computer based MIS? Discuss the various advantages and disadvantages of MIS. **10**

**P. T. O**

- Q.7 a) Define social responsibility. Why should it be the responsibility of business to look after the interest of the community? **10**
- b) Write short notes on:
- i) Performance appraisal.
  - ii) Leadership. **5x2**

**End Semester Examination, Dec. 2023**  
 BCA — Third Semester  
**SOFT SKILLS AND APTITUDE DEVELOPMENT-I**  
**(BCA-DS-309)**

Time: 2 hrs.

Max Marks: **50**  
 No. of pages: 5

**Please read the instructions carefully**

Note: All questions are **compulsory**. Each question has **FOUR** options with **ONE** correct answer. Select the correct answer. All questions are of **ONE** mark each. There is no **NEGATIVE** marking. Mention the correct option for each question in the blank answer key given herein below. Calculator is not permitted. Use only black or blue pen.

Answer Table:

Q.1.	Q.2.	Q.3.	Q.4.	Q.5.	Q.6.	Q.7.	Q.8.	Q.9.	Q.10.
Q.11.	Q.12.	Q.13.	Q.14.	Q.15.	Q.16.	Q.17.	Q.18.	Q.19.	Q.20.
Q.21.	Q.22.	Q.23.	Q.24.	Q.25.	Q.26.	Q.27.	Q.28.	Q.29.	Q.30.
Q.31.	Q.32.	Q.33.	Q.34.	Q.35.	Q.36.	Q.37.	Q.38.	Q.39.	Q.40.
Q.41.	Q.42.	Q.43.	Q.44.	Q.45.	Q.46.	Q.47.	Q.48.	Q.49.	Q.50.

- Q.1 There are 36 boys and 44 girls in a class. The average score of boys is 40 points and girls is 35 points. Then what will be the average score of the class? [CO-1][L-2]  
 A] 37.25                                      B] 22.5                                      C] 52.85                                      D] 65.78
- Q.2 The average of 15 numbers is 15. If the average of first five numbers is 14 and that of other 9 numbers is 16, then find the middle number. [CO-1][L-1]  
 A] 9    B] 11    C] 7    D] 11
- Q.3 The average age of five members is 27. If one of them is excluded the average decreases by 2. The age of excluded person is: [CO-1][L-1]  
 A] 20    B] 25    C] 35    D] 45
- Q.4 What is the largest 4 digit number exactly divisible by 88? [CO-1][L-1]  
 A] 9944    B] 9956    C] 2000    D] 9955
- Q.5 Which one of the following can't be the square of a natural number? [CO-2][L-1]  
 A] 128245    B] 128248    C] 128242    D] 128248
- Q.6 In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other candidate got, was: [CO-2][L-1]  
 A] 2700    B] 2900    C] 3000    D] 5000
- Q.7 How many factors of 1080 are perfect squares? [CO-2][L-1]  
 A] 4    B] 7    C] 5    D] 6

- Q.8 A student has to obtain 33% of the total marks to pass. He got 125 marks and failed by 40 marks. The maximum marks are: **[CO-2] [L-2]**
- A] 500 B] 750 C] 550 D] 850
- Q.9 The sum of a series,  $27+36+45+\dots\dots\dots+162$  is 1512. What is the number of terms in the series? [CO-2][L-1]
- A] 15 B] 16 C] 12 D] 10
- Q.10 If the product and H.C.F. of two numbers are 4107 and 37 respectively, then find the greater number. [CO-1][L-1]
- A] 111 B] 135 C] 150 D] 170
- Q.11 Pointing to a person, a man said to a woman, "His mother is the only daughter of your father." How was the woman related to the person? [CO-1][L-1]
- A] Uncle B] Aunt C] Father D] Mother
- Q.12 If Ranveer Singh finds that he is 13th from the right in a line of boys and 8th from the left, how many boys should be included in the line such that there are 30 boys in the line? [CO-2][L-1]
- A] 10 B] 19 C] 12 D] 14
- Q.13 Krishna ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class? [CO-1][L-1]
- A] 48 B] 55 C] 65 D] 51
- Q.14 One morning after sunrise, Suresh was standing facing a pole. The shadow of the pole fell exactly to his right. To which direction was he facing? [CO-1][L-1]
- A] South B] North C] East D] West
- Q.15 Find the logarithm of 144 to the base  $2\sqrt{3}$ ? [CO-1][L-1]
- A] 8 B] 9 C] 6 D] 4
- Q.16 The unit digit in the product  $(784 \times 618 \times 917 \times 463)$  is: [CO-1][L-1]
- A] 2 B] 3 C] 4 D] 5
- Q.17 Find the number of factors of 9321? [CO-1][L-1]
- A] 8 B] 5 C] 7 D] 3
- Q.18 K is 40 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K?
- A] South B] East C] North D] West



- Q.19 G is the grandfather of S. B has only two sons E and F. A and B are the only sons of G. Who is the father of S?  
**[CO-3] [L-1]**  
 A] A                                      B] B                                      C] E                                      D] F
- Q.20 If A is the brother of B; B is the sister of C; and C is the father of D, how D is related to A?  
**[CO-3][L-1]**  
 A] Can't be determined      B] Sister                                      C] Uncle                                      D] Aunt
- Q.21 During assembly the students are standing in a line. Salman Khan is 21st in order from both the ends. How many boys are there in the class?  
**[CO-3][L-1]**  
 A] 40                                      B] 41                                      C] 44                                      D] 45
- Q.22 If Rocky finds that he is 31st from the right in a line of boys and 8th from the left, how many boys should be included in the line such that there are 60 boys in the line?  
**[CO-3][L-1]**  
 A] 7                                      B] 8                                      C] 20                                      D] 12
- Q.23 How many 4's are there preceded by 7 but not followed by 3?  
**[CO-3][L-1]**  
 5 9 3 2 1 7 4 2 6 9 7 4 6 1 3 2 8 7 4 1 3 8 3 2 5 6 7 4 3 9 5 8 2  
 0 1 8 7 4 6 3  
 A] Four                                      B] Six                                      C] Two                                      D] One
- Q.24 How many such pairs of digits are there in the number 421579368 each of which has as many digits between them in the number as when they are arranged in ascending order?  
**[CO-3][L-1]**  
 A] One                                      B] Three                                      C] Two                                      D] Six
- Q.25 In a class of 50 students M is eighth from top. H is 20th from bottom. How many students are there between M and H?  
**[CO-3][L-1]**  
 A] 18                                      B] 20                                      C] 21                                      D] 22
- Q.26 Find the sum of the first 10 numbers of this arithmetic series: 1, 11, 21, 31...  
**[CO-3][L-1]**  
 A] 500                                      B] 480                                      C] 420                                      D] 460
- Q.27 If 11th term is 47 and first term is 7. What is common difference between them?  
**[CO-1][L-1]**  
 A] 3                                      B] 4                                      C] 8                                      D] 2
- Q.28 The sum of the first 3 terms in an AP is 6 and that of the last 3 terms is 16. If the AP has a total of 13 terms, what is the sum of the middle three terms?  
**[CO-1] [L-1]**  
 A] 11                                      B] 10                                      C] 8                                      D] 9
- Q.29 Priya cycles 5 km North, then turns East and cycles 4 km, then turns South and cycles 5 km, then turns to her right and cycles 6 km. Where is she now with reference to her starting position?  
**[CO-1][L-1]**

- A] 2 km East                      B] 2 km West                      C] 10 km West                      D] 10 km East
- Q.30 A man walks 5 km toward south and then turns to the right. After walking 3 km he turns to the left and walks 4 km. And then he goes back 10 km straight. Now in which direction is he from the starting place? [CO-1][L-1]  
A] North-West                      B] South                      C] East                      D] West
- Q.31 \_\_\_\_\_ involves the development of action plan designed in order to motivate and guide a person or group towards a goal. [CO-4][L-1]  
A] Decision                      B] Goal Setting                      C] Self-awareness                      D] Hard work
- Q.32 Locke and Latham's Goal setting theory includes clarity, challenge, commitment, feedback and \_\_\_\_\_. [CO-4][L-1]  
A] Complexity                      B] Simplicity                      C] Difficulty                      D] Problem
- Q.33 SMART goals abbreviation stands for specific, measurable, achievable, realistic and \_\_\_\_\_. [CO-4][L-1]  
A] time framed                      B] time limit                      C] target date                      D] time bound
- Q.34 If there are no \_\_\_\_\_ there is no progress. [CO-4][L-1]  
A] neutral                      B] violation                      C] challenges                      D] busyness
- Q.35 Knowing \_\_\_\_\_ is the beginning of all wisdom. [CO-4][L-1]  
A] yourself                      B] others                      C] himself                      D] herself
- Q.36 Body's reaction to a change that requires a physical, mental or emotional adjustment or response is called \_\_\_\_\_. [CO-5][L-1]  
A] tension                      B] strain                      C] stress                      D] trauma
- Q.37 Fear, anger, loneliness, worry are some of the symptoms of \_\_\_\_\_ stress. [CO-5][L-1]  
A] Cognitive                      B] Physical                      C] Behavioral                      D] Emotional
- Q.38 \_\_\_\_\_ stress enables concentration, increases performance and it energizes you. [CO-5][L-2]  
A] distress                      B] eustress                      C] neutral                      D] good
- Q.39 In ABC strategy A stands for awareness, B is for Balance and C is for \_\_\_\_\_. [CO-4][L-1]  
A] control                      B] command                      C] change                      D] charge
- Q.40 "If your \_\_\_\_\_ does not include yourself, it is incomplete". Jack Kornfield. [CO-6][L-1]  
A] care                      B] concern                      C] compassion                      D] empathy
- Q.41 Negative stress results in reduced effectiveness, loss of motivation, \_\_\_\_\_ and mental problems and behavioral problems. [CO-4][L-1]  
A] physical                      B] emotional                      C] cognitive                      D] spiritual

- Q.42 Right frame of mind, right technique and right \_\_\_\_\_ contributes to managing time better. [CO-4][L-2]  
 A] motivation B] a volition C] successful D] distraction
- Q.43 Managing time better increases effectiveness and \_\_\_\_\_. [CO-4][L-2]  
 A] efficiency B] stress C] issues D] challenges
- Q.44 Perfectionism, insecurity, clutter, being unorganized could be the reasons for \_\_\_\_\_. [CO-4][L-2]  
 A] delaying tactics B] stalling C] procrastination D] dragging
- Q.45 Personal approach to handling time could be developing a positive attitude, ownership for time loss and aiming for \_\_\_\_\_. [CO-5][L-1]  
 A] excellence B] mediocrity C] conflicts D] distress
- Q.46 Handling time in a better way helps reducing stress and increases \_\_\_\_\_. [CO-5][L-1]  
 A] creativity B] problem C] busyness D] stress
- Q.47 \_\_\_\_\_ is the first stage of team formation. [CO-6][L-1]  
 A] storming B] norming C] forming D] performing
- Q.48 "Humanity to others", is the English translation of which ancient African word? [CO-4][L-1]  
 A] Ubuntu B] hakunamatata C] swahii D] zulu
- Q.49 Building bond, creating understanding, trust, resolving conflict, overcoming obstacles, achieving growth together can be termed as a \_\_\_\_\_. [CO-6][L-1]  
 A] distance B] team C] class D] troupe
- Q.50 Ubuntu means there is no ME without \_\_\_\_\_. [CO-5][L-1]  
 A] you B] her C] him D] them

# End Semester Examination, Dec. 2023

BCA – Fifth Semester

## DATA COMMUNICATION AND NETWORKING (BCA-DS-501/BCA-501A (CB) /BCA-501(CB))

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

### Q.1 **Multiple choice questions:**

- a) TCP/IP model was developed \_\_\_\_\_ the OSI model. [CO4][L1]  
i) Prior to ii) after  
iii) Simultaneous to iv) none of the mentioned
- b) Which address identifies a process on a host? [CO3][L1]  
i) Physical address ii) Logical address  
iii) Port address iv) Specific address
- c) Which address is used in an internet employing the TCP/IP protocols? [CO4][L1]  
i) Physical address and logical address ii) Port address  
iii) Specific address iv) All of the mentioned
- d) In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are: [CO4][L1]  
i) Added ii) Removed iii) Rearranged iv) Modified
- e) Communication between a computer and a keyboard involves \_\_\_\_\_ transmission. [CO1][L1]  
i) Automatic ii) Half-duplex iii) Full-duplex iv) Simplex
- f) Packet in the IP layer are called \_\_\_\_\_. [CO2][L1]  
i) Datagram ii) Base header iii) Router iv) MAC
- g) In cyclic redundancy checking, what is CRC? [CO3][L1]  
i) The divisor ii) the quotient iii) The dividend iv) The remainder
- h) AM and FM are example of \_\_\_\_\_ modulation. [CO2] [L1]  
i) Digital-to-digital ii) Digital-to-analog  
iii) Analog-to-analog iv) Analog-to-digital
- i) In time-domain plot, the horizontal axis is a measure of \_\_\_\_\_. [CO1][L1]  
i) Signal amplitude ii) Frequency  
iii) Phase iv) Time
- j) UDP and TCP are both \_\_\_\_\_ layer protocols. [CO3][L1]  
i) Physical ii) Data link iii) Network iv) Transport **2×10**

### **PART-A**

- Q.2 What do you mean by sampling? Explain PAM and PCM in sampling with proper diagram? Using bit pattern 001101011110, Draw NRZ(L), NRZ(I), Bipolar and Manchester encoding patterns. [CO2] [L3] **20**
- Q.3 Given a 10 bit sequence 1010011110 and a divisor of 1011, find the CRC. Check your answer. Also discuss how guided media differ from unguided media. [CO3] [L3] **20**
- Q.4 Explain various switching methods with emphasis on their operating procedure, error detection methods and the drawbacks they have. [CO2] [L2] **20**

**P. T. O**

## **PART-B**

- Q.5 How many bits is an IPv4 address? How many bits is an IPv6 address? Name and describe the three types of IPv6 addresses? Also give a relevant example of both.  
[CO4] [L3] **20**
- Q.6 Why is Frame Relay a better solution for connecting LANs than T-lines? How many virtual connections can be defined in a UNI? How many virtual connections can be defined in an NNI?  
[CO4] [L2] **20**
- Q.7 What do you understand by computer security? Why is computer security important? What are the key areas of concerns related to computer security? Define deliberate act of theft and who is generally responsible for this act.  
[CO5] [L2] **20**

# End Semester Examination, Dec. 2023

BCA – Fifth Semester

## RDBMS USING ORACLE (BCA-DS-502/BCA-503 (CB)/BCA-503A (CB))

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Define various conditions of good database design.
- b) Describe transitive dependency.
- c) Explain two basic features of oracle 11g.
- d) Discuss entity and degree of relationship.
- e) Explain primary key.
- f) Alter table command.
- g) Define %type.
- h) What is trigger?
- i) What is local function?
- j) Describe deadlock.

**2×10**

### **PART-A**

Q.2 What is three level schema architecture of Database system? Explain with suitable example. Give advantages and disadvantages of database system. [CO1][L1,2,3] **20**

Q.3 What is Normalization? Explain different form of normalization with suitable examples. [CO2][L1,3] **20**

Q.4 Explain following commands with proper syntax:

- a) Update table.
- b) Drop table and delete table.
- c) Like operators.
- d) Create table.

[CO3][L3,4] **5×4**

### **PART-B**

Q.5 What are the problems of SQL and how they are solved by PL/SQL? Explain the architecture of PL/SQL. [CO4][L1,2,3] **20**

Q.6 What are implicitly raised exceptions? Name some predefined exceptions and their importance. Implement ZERO\_DIVIDE exception with suitable PL/SQL code. [CO5][L3,4] **20**

Q.7 Discuss the importance of CURSOR. Explain the steps of implicit cursor handling and manipulating data with it. Develop a PL/SQL code for SQL%NOTFOUND cursor. [CO5] [L3] **20**

**End Semester Examination, Dec. 2023**  
BCA – Fifth Semester  
**PYTHON PROGRAMMING (BCA-DS-503/BCA-506(CB))**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

- a) What is the method inside the class in python language? [CO-2] [L-1]  
i) Object                      ii) Function                      iii) Attribute                      iv) Argument
- b) Which of the following is correct about dictionaries in python? [CO-3] [L-1]  
i) Python's dictionaries are kind of hash table type.  
ii) They work like associative arrays or hashes found in Perl and consist of key-value pairs.  
iii) A dictionary key can be almost any Python type, but are usually numbers or strings. Values, on the other hand, can be any arbitrary Python object.  
iv) All of the above.
- c) Which module is used in python to create Graphics? [CO-4] [L-1]  
i) Turtle                      ii) Canvas                      iii) Tkinter                      iv) Graphics
- d) Which of the following function converts a string to all lowercase? [CO-3] [L-1]  
i) lower()                      ii) lstrip()                      iii) max(str)                      iv) min(str)
- e) Which of the following statement terminates the loop statement and transfers execution to the statement immediately following the loop? [CO-3] [L-1]  
i) break                      ii) continue                      iii) pass                      iv) None of the above.
- f) What is the output of print str \* 2 if str = 'Hello World!'? [CO-2] [L-1]  
i) Hello World! Hello World!                      ii) Hello World! \* 2  
iii) Hello World!                      iv) None of the above.
- g) Which of the following is correct about tuples in python? [CO-3] [L-1]  
i) A tuple is another sequence data type that is similar to the list.  
ii) A tuple consists of a number of values separated by commas.  
iii) Unlike lists, however, tuples are enclosed within parentheses.  
iv) All of the above.
- h) Syntax error in python is detected by \_\_\_\_\_ at \_\_\_\_\_ [CO-1] [L-1]  
i) Compiler/ compile time                      ii) Interpreter/ run time  
iii) Compiler/ run time                      iv) Interpreter/ compile time
- i) Which of the following word can be used to add something to the end of the string? [CO-3] [L-1]  
i) Concatenate                      ii) Append                      iii) Join                      iv) Add
- j) Arbitrary arguments have which symbol in the function definition before the parameter name? [CO-3] [L-1]  
i) &                      ii) #                      iii) %                      iv) \*                      **2×10**

**PART-A**

**Q.2 Explain the following:**

- a) Utility of break statement with an example.  
b) Utility of continue statement with an example.  
c) Difference between pass and continue statement.  
d) Use of multiline comments.

[CO-3] [L-2] **5×4**

- Q.3 a) Write a program to read a character until a \* is encountered. Also count the number of uppercase, lowercase and numbers entered by user. [CO-5] [L-3] **10**
- b) Differentiate between For loop and while loop with the help of flow of their execution and at least two programs of each loop. [CO-3] [L-2] **10**
- Q.4 Python has developed as an open source project. Justify this statement. Also describes various features of python. [CO-1] [L-1] **20**

### ***PART-B***

- Q.5 Write a program to read a file that contains small case characters. Then write these characters into another file with all lowercase characters converted into uppercase. [CO-5] [L-3] **20**
- Q.6 Describe the term Exception Handling. What is difference between built-in exceptions and user defined exceptions. How exceptions are dissimilar with errors. [CO-4] [L-3] **20**
- Q.7 Discuss different ways in which you can create a list. With the help of an example, explain the concept of nested lists. Also explain the concept of list comprehension. [CO-3] [L-3] **20**



**End Semester Examination, Dec. 2023**  
BCA – Fifth semester  
**INTRODUCTION TO CLOUD COMPUTING (BCA-DS-505)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 Explain the following:
- a) List pros and cons of cloud computing.
  - b) What do you mean by hybrid cloud?
  - c) Why virtualization is required in implementing cloud?
  - d) What are the different data types used in cloud computing?
  - e) Give some examples of public cloud.
  - f) Name some companies who offer cloud service development?
  - g) What are the advantages of using Hadoop?
  - h) What is the role of data node in HDFS?
  - i) Mention the issues of security in cloud computing?
  - j) Define 'data security'. [CO1,2,3,4] [L2] [L3] **2×10**

**PART-A**

- Q.2 a) Describe the features of economic and business model of cloud computing. [CO1,2][L-2] **10**
- b) State similarities and differences between grid and cloud computing? [CO2,3][L-1] **10**
- Q.3 a) What are the fundamental requirements for cloud architecture? [CO2,3][L-1] **10**
- b) Explain in detail, development facilities in Azure. [CO3,4][L-2] **10**
- Q.4 a) Discuss SaaS maturity models. [CO4,6][L-2] **10**
- b) What is VIM? How is it related to cloud infrastructure management? [CO3,4][L-1] **10**

**PART-B**

- Q.5 a) Are clouds secure? List and discuss the security and privacy implications of cloud computing? [CO1,5][L-6] **10**
- b) Why homomorphic encryption is used in cloud computing? List some applications of homomorphic encryption. [CO4,5][L-1] **10**
- Q.6 a) Discuss Cloud migration techniques. Explain risks associated with cloud computing. [CO3,4][L-2] **10**
- b) Explain the Google App Engine request handling architecture with diagram. [CO4,6][L-2] **10**
- Q.7 a) Explain various terminologies used in cloud administration and management? [CO5,6][L-2] **10**
- b) What is secure execution environment and communication in cloud? Explain cloud Instant messaging? [CO3,5][L-1] **10**

**End Semester Examination, Dec. 2023**  
OPEN ELECTIVE - COMMON FOR ALL BRANCHES  
**MANAGING SKILLS FOR FRONT OFFICE APPLICATIONS**  
**(BCA-OE-005)**

Time: 3 hrs.

Max Marks: **100**

No. of Pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following questions:

- a) What is a computer?
  - i) Device that transforms data into information
  - ii) Input processor
  - iii) Electronic devices
  - iv) All of the above
- b) An analog computer operates on which type of data?
  - i) Text Files
  - ii) Analog Data
  - iii) Digital Data
  - iv) None of the above
- c) This device is used for computer games.
  - i) Light
  - ii) Joystick
  - iii) Stylus
  - iv) None of the above
- d) Which device is used to convert hard copy to soft copy?
  - i) Touch Pad
  - ii) Touch Screen
  - iii) Scanner
  - iv) Printer
- e) What is the valid format of MS Word?
  - i) .exe
  - ii) .jpeg
  - iii) .doc
  - iv) .mdb
- f) What is the name of the blinking symbol appearing on-screen signifying the area where the next character is going to appear?
  - i) Delete Key
  - ii) Cursor
  - iii) Return Key
  - iv) None of the above
- g) In the formula, which symbol specifies the fixed columns or rows?
  - i) \$
  - ii) \*
  - iii) %
  - iv) ;
- h) Which of the following is not a powerpoint view?
  - i) Normal view
  - ii) Slide view
  - iii) Design view
  - iv) Slide sorter view
- i) Which of the following is not a powerpoint layout?
  - i) Title slide
  - ii) Blank slide
  - ii) Two-column slide
  - iv) Three-column slide
- j) In MS-Access, to open an existing database, press.
  - i) CTRL+N
  - ii) CTRL+O
  - iii) Alt+F4
  - iv) None of the above. [CO1-CO5][L1] **2×10**

**PART-A**

- Q.2
- a) Explain the types of storage devices, including hard drives, solid-state drives and optical drives. [CO1][L-2] **10**
  - b) Examine the functions and importance of operating systems in managing hardware resources and providing a user interface. [CO1][L-2] **10**

**P.T.O.**

- Q.3 a) What are the key editing tools available in word processors, and how do they facilitate document refinement? [CO2][L-2] **10**  
b) Enumerate the formatting options provided by word processors for font styles, sizes, and paragraph layouts. [CO2][L-2] **10**
- Q.4 a) Explain the steps involved in performing a mail merge. [CO2][L-2] **10**  
b) Discuss the role of paragraph formatting in structuring and organizing written content. [CO2][L-2] **10**

**PART-B**

- Q.5 a) What is custom animation in the context of slide presentations? [CO3][L-2] **10**  
b) Discuss the purpose of slide transitions in a presentation. [CO3][L-3] **10**
- Q.6 a) Describe the process of creating a chart in a spreadsheet. Discuss the types of charts available and their use cases. [CO4][L-2] **10**  
b) What is a Pivot table, and how does it help in data analysis? [CO4][L-3] **10**
- Q.7 a) Explain the steps involved in creating a new table in a database. [CO5][L-2] **10**  
b) Describe the process of creating a report in a database. Specify elements that can be included in a report to present data effectively. [CO5][L-3] **10**

**End Semester Examination, Dec. 2023**  
B. Sc. (Information Technology) – First Semester  
**OPERATING SYSTEM (BSCIT–DS-102)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1
- a) When was the first operating system developed? [CO-3][L-1]
    - i) 1948                      ii) 1949                      iii) 1950                      iv) 1951
  - b) Banker's algorithm is used? [CO-2][L-2]
    - i) To prevent deadlock                      ii) To deadlock recovery
    - iii) To solve the deadlock                      iv) None of these
  - c) If a page number is not found in the translation look a side buffer, then it is known as a? [CO-2][L-2]
    - i) Translation Lookaside Buffer miss                      ii) Buffer miss
    - iii) Translation Lookaside Buffer hit                      iv) All of the mentioned
  - d) Which one of the following errors will be handled by the operating system? [CO-3][L-2]
    - i) Lack of paper in printer                      ii) Connection failure in the network
    - iii) Power failure                      iv) All of the mentioned
  - e) The address generated by the CPU is referred to as \_\_\_\_\_. [CO-2][L-2]
    - i) Physical address                      ii) Logical address
    - iii) Neither physical nor logical                      iv) None of the mentioned
  - f) Swapping requires a \_\_\_\_\_. [CO-3][L-2]
    - i) Motherboard                      ii) keyboard                      iii) monitor                      iv) backing store
  - g) The \_\_\_\_\_ time in a swap out of a running process and swap in of a new process into the memory is very high. [CO-3][L-2]
    - i) context – switch                      ii) waiting
    - iii) execution                      iv) all of the mentioned
  - h) Error handler codes, to handle unusual errors are \_\_\_\_\_. [CO-4][L-2]
    - i) almost never executed                      ii) executed very often
    - iii) executed periodically                      iv) none of the mentioned
  - i) The state of a process is defined by \_\_\_\_\_. [CO-2][L-2]
    - i) The final activity of the process
    - ii) the activity just executed by the process
    - iii) the activity to next be executed by the process
    - iv) the current activity of the process
  - j) Choose one of the disadvantages of the priority scheduling algorithm? [CO-3][L-2]
    - i) it schedules in a very complex manner
    - ii) its scheduling takes up a lot of time
    - iii) it can lead to some low priority process waiting indefinitely for the CPU
    - iv) none of the mentioned

**2×10**

**PART-A**

- Q.2
- a) Explain the architecture of operating system with suitable diagram [CO-1][L-2] **10**
  - b) How processes can communicate with each other and synchronize their actions? Explain the different ways to achieve this. [CO-1][L-1] **10**

**P. T. O**

- Q.3 a) What are the necessary conditions that the process should satisfy to prevent it from entering into the critical section? [CO-1][L-2] **8**  
 b) Explain the producer-consumer problem and give their solution with the help of Semaphore. [CO-2][L-3] **12**

- Q.4 a) Consider the following set of processes, with the length of CPU-burst time given in milliseconds.

Process	Burst time	Priority
p1	10	2
p2	4	1
p3	9	3
p4	7	4
p5	5	2

The processes are assumed to have arrived in order p1, p2, p3, p4, p5 all at time 0.

- i) Draw Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum=3) scheduling.  
 ii) Calculate the waiting time and turnaround time of each process for each of the scheduling algorithms. [CO-3][L-4] **12**
- b) Explain the criteria that should be considered during the selection of CPU scheduling Algorithms. [CO-3][L-2][L-4] **8**

### **PART-B**

- Q.5 a) Explain the use of a resource allocation graph. [CO-3][L-3] **5**  
 b) State and explain the Banker's Algorithm for deadlock avoidance. Let us consider the following scenario and solve it by applying banker's algorithm.

State	Allocation	Maximum Need
Process P0	112	433
Process P1	212	322
Process P2	401	402
Process p3	020	753
Process P4	112	112

Available resources of A, B, C are: 2 1 0

- i) Find the content of matrix Need and determine whether the system is in safe state or not.  
 ii) If a process request for p1 arrives (0,4,2), can the request be granted immediately. [CO-3][L-3] **15**
- Q.6 a) Describe under what circumstances do page faults occur? Describe the action taken by the operating system when a page fault occurs. [CO-4][L-2] **10**  
 b) Explain the different ways of memory allocation in Contiguous memory allocation. [CO-4][L-3] **10**
- Q.7 a) As we know that files store information and this information can be accessed in several ways. Explain the various file access method a system can use to access information? [CO-5][L-2] **10**  
 b) Write short notes on:  
 i) FCFS.  
 ii) C-SCAN. [CO-5][L-2] **10**









b) Find Karl Pearson's coefficient of correlation between the values of X and Y given data:

X	128	129	130	140	132	135	125	130	132	135
Y	80	89	90	95	96	94	80	100	96	100

[CO6][L5] **10**

**End Semester Examination, Dec. 2023**  
B. Sc. (Information Technology) – First Semester  
**PYTHON PROGRAMMING (BSCIT-DS-110)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1
- a) What is the difference between a syntax error and a logical error. [CO-1] [L-1]
  - b) What is the concept of user-defined functions? [CO-3] [L-1]
  - c) Write the full form of OOP [CO-1] [L-1]
  - d) Define 'runtime errors'. [CO-1] [L-1]
  - e) What is a string? [CO-3] [L-1]
  - f) Define 'Logical operations'. [CO-2] [L-1]
  - g) Write any two applications of python? [CO-3] [L-1]
  - h) Write the full form of IDE. [CO-1] [L-1]
  - i) Write the concept of built-in function. [CO-4] [L-1]
  - j) Name the techniques that are used to handle the errors. [CO-1] [L-1] **2×10**

**PART-A**

- Q.2 List and explain various operators supported in python. What are implicit conversions? Give an example. [CO-1] [L-1] **20**
- Q.3 Rohit is a student of class 12<sup>th</sup>. He wants to check whether the two straight lines are perpendicular or parallel to each other. Which data type (Mutable or immutable) is suitable for him to check the conditions of straight line. If both data types can be used then why? Explain both the data types with suitable example. [CO-1][L-3] **20**
- Q.4 For loop is usually known as a determinate or definite loop. Justify this statement with the help of an example. Differentiate between counter controlled loops and sentinel controlled loops. [CO-2][L-2] **20**

**PART-B**

- Q.5 Python strings are immutable. Comment on this statement. Also explain with examples how we can concatenate a string and a floating point data. [CO-4][L-2] **20**
- Q.6 Discuss different ways in which you can create a list. With the help of an example, explain the concept of nested lists. Also explain the concept of list comprehension. [CO-4][L-2] **20**
- Q.7 Write a program to read a file that contains small case characters. Then write these characters into another file with all lowercase characters converted into uppercase. [CO-4][L-3] **20**

# End Semester Examination, Dec. 2023

B. Sc. (Information Technology) – Third Semester

## OBJECT ORIENTED PROGRAMMING USING JAVA (BSCIT-DS-301)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1
- What is the size of float and double in java? [CO-1][L-2]  
i) 32 and 64                      ii) 32 and 32                      iii) 64 and 64                      iv) 64 and 32
  - What are the variables declared in a class for the use of all methods of the class called? [CO-2][L-1]  
i) Object                                      ii) a class object in which it is defined  
iii) void                                      iv) none of the above
  - What does the expression float a = 35 / 0 return? [CO-1][L-1]  
i) 0                                      ii) not a number                      iii) Infinity                      iv) none of the above
  - Identify the incorrect Java feature. [CO-1][L-1]  
i) Object-oriented    ii) Use of pointers    iii) Dynamic                      iv) neutral
  - Where is System class defined? [CO-3][L-1]  
i) GREATEST, LEAST and ABS                      ii) SUM, COUNT and AVERAGE  
iii) UPPER, LOWER and LENGTH                      iv) SQRT, POWER and MOD
  - Identify the modifier which cannot be used for constructor. [CO-2][L-1]  
i) Public                      ii) Protected                      iii) Private                      iv) Static
- Answer in brief:
- Define classpath. [CO-3][L-1]
  - Write the structure of java program. [CO-3][L-1]
  - When do we protect access specifier? [CO-1][L-1]
  - Arrays in java are:  
i) Object references    ii) Objects    iii) Primitive data type    iv) None [CO-1][L-2] **2×10**

### **PART-A**

- Q.2 Discuss the salient features of java programming language. How java is differ from C and C++. Explain. [CO-1] [L-6] **20**
- Q.3
- Design a program to print the Fibonacci series up to n terms. [CO-1] [L-6] **10**
  - Give the syntax, purpose and flowchart of the following:  
i) Else-if ladder statement.  
ii) For Loop. [CO-1][L-1] **5×2**
- Q.4
- What is Interface in Java? How is interface implemented? Explain it with the help of an example. [CO-1][L-1] **10**
  - Discuss the features of java. [CO-1][L-1] **10**

### **PART-B**

- Q.5 Create an applet that will receive three numeric values as input from the user and then displays the largest of these on the screen. Write a simple HTML page to include this applet. [CO-1][L-1] **20**
- Q.6 Discuss the types of memory allocations in java. [CO1][L1] **20**
- Q.7
- Explain following:  
i) Constructors and its syntax.                      ii) Wrapper classes. [CO-1][L-1] **10**
  - Can you override static methods in java? Explain. [CO-1][L-1] **10**



Q.3 What is multiplexing? How synchronous TDM is different from asynchronous TDM. [CO-2][L-2] **20**

Q.4 a) Discuss the advantages and disadvantages of wireless networking. [CO-4][L-2] **10**  
b) Explain the difference between half-duplex and full-duplex communication. [CO-2][L-2] **10**

**PART-B**

Q.5 a) Discuss the spiral software development life cycle model with diagrammatic illustration. Also converse its strengths and deficiencies? [CO-4][L-2] **10**  
b) Explain the concept of file and print services. What are their functions, and how do they benefit an organization? [CO-4][L-4] **10**

Q.6 Explain the process of domain name resolution, and the role of DNS servers in the process. [CO-6] [L-2] 10  
[CO-2][L-4] **20**

Q.7 Explain the process of subnetting, and provide an example of subnetting in a network. [CO-4][L-2] **20**

**End Semester Examination, Dec. 2023**  
B. Sc. (Information Technology) – Third Semester  
**COMPUTER ARCHITECTURE AND ORGANIZATION (BSCIT-DS- 303)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

i) Half adder circuit is \_\_\_\_\_? [CO2][L1]

- a) Half of an AND gate                      b) A circuit to add two bits together [CO4][L1]  
c) Half of a NAND gate                      d) None of the above
- ii) The simplified form of Boolean expression  $(X + Y + Z)(Z + Y' + Z')$  is: [CO2][L1]  
a)  $X' Y + Z'$                                       b)  $X + Y' + Z$   
c)  $X$     d)  $XY + Z'$

iii) A combinational circuit which is used to change a decimal number into an equivalent BCD number is: [CO4][L1]

- a) Decoder    b) Encoder [CO4][L1]  
c) Multiplexer    d) Demultiplexer
- iv) The format used to present the logic output for the various combinations of logic inputs to a gate is called a(n): [CO1][L1]

- a) Boolean variable                                      b) Truth table [CO1,CO4][L1]  
c) Input logic function                                      d) Boolean Constant

v) On a master-slave flip-flop, when is the master enabled? [CO1][L4]  
[CO4][L1]  
a) When the gate is LOW                                      b) When the gate is HIGH  
c) Both of the above                                      d) Neither of the above

vi) A 20-bit address bus allows access to a memory of capacity. [CO3][L1]  
[CO3][L1]  
a) 1 Mb    b) 2 Mb  
c) 32Mb    d) 64 Mb

vii) Which gate is inverted OR gate. [CO4][L1]  
[CO1,CO4][L1]  
a) NAND    b) NOR  
c) AND    d) XOR gate

viii) Parity bit is: [CO1][L1]

[CO2, CO1][L1]







**End Semester Examination, Dec. 2023**  
B. Sc. (Information Technology) – Third Semester  
**ARTIFICIAL INTELLIGENCE (BSCIT-DS-305)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Multiple choice questions:

- i) Which of the following algorithm is related to Artificial Intelligence? [CO1][L1]  
[CO4][L1]  
a) Routing algorithm                      b) Greedy algorithm  
c) Hill climbing algorithm              d) Recursive algorithm
- ii) Which of the following languages is suitable for artificial intelligence? [CO1][L2]  
a) FORTRAN                                  b) BASIC  
c) PROLOG                                    d) C
- iii) Which of the following is not true in problem solving in artificial intelligence? [CO1][L2]  
[CO4][L1]  
a) Implements heuristic search technique  
b) Solution steps are not explicit  
c) Knowledge is imprecise  
d) It works on or implements repetition mechanism
- iv) Machine becomes intelligent once they are? [CO1][L1]  
[CO1,CO4][L1]  
a) trained                                      b) started  
c) installed                                    d) turned off
- v) In AI, an environment is uncertain if it is: [CO1][L2]  
[CO4][L1]  
a) Not fully observable and not deterministic  
b) Fully observable and not deterministic  
c) Not fully observable and deterministic  
d) Fully observable and deterministic
- vi) An AI agent can improve its, performance by: [CO5][L1]  
[CO3][L1]  
a) Learning                                    b) Responding  
c) Observing                                    d) Perceiving
- vii) Which of the following is not an application of AI? [CO5][L1]  
a) Intelligent robots                      b) Handwriting recognition  
c) Speech recognition                      d) Content mining
- viii) What is the full form of ANN? [CO3] [L-1]  
[CO2, CO1][L1]



- Q.7 Machine Learning is talked about as the sub-field of Artificial Intelligence. Why is it said so? Explain the concept of Machine learning along with its learning techniques and applications. [CO5][L2] **20**

# End Semester Examination, Dec. 2023

B. Sc. (Information Technology) – Fifth Semester

## BIG DATA ANALYTICS (BSCIT-DS-501)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 a) How many V's of Big Data? [CO1][L1]  
i) 2 ii) 3  
iii) 4 iv) 5
- b) In computers, a \_\_\_\_\_ is a symbolic representation of facts or concepts from which information may be obtained with a reasonable degree of confidence. [CO1][L1]  
i) Data ii) Knowledge  
iii) Program iv) Algorithm
- c) In Big Data environments, velocity refers to: [CO1][L1]  
i) Data can arrive at fast speed  
ii) Enormous datasets can accumulate within very short periods of time  
iii) Velocity of data translates into the amount of time it takes for the data to be processed  
iv) All of the mentioned above
- d) In Big Data environments, Variety of data includes: [CO1][L1]  
i) Includes multiple formats and types of data  
ii) Includes structured data in the form of financial transactions,  
iii) Includes semi-structured data in the form of emails and unstructured data in the form of images  
iv) All of the mentioned above
- e) Which of the following are benefits of big data processing? [CO2][L1]  
i) Cost reduction ii) Time reductions  
iii) Smarter business decisions iv) All of the mentioned above
- f) Data that does not conform to a data model or data schema is known as \_\_\_\_\_. [CO3][L1]  
i) Structured data ii) Unstructured data  
iii) Semi-structured data iv) All of the mentioned above
- g) Amongst which of the following can be considered as the main source of unstructured data. [CO3][L1]  
i) Twitter ii) Facebook  
iii) Webpages iv) All of the mentioned above
- h) Virtualization separates resources and services from the underlying physical delivery environment. [CO4][L1]  
i) True ii) False
- i) MongoDB is a \_\_\_\_\_ database. [CO4][L1]  
i) SQL ii) DBMS  
iii) NoSQL iv) RDBMS
- j) MongoDB support cross platform and is written in \_\_\_\_\_ language. [CO4][L1]  
i) Python ii) C++

2\*10=20 MARKS

**PART-A**

- Q.2 Explain with examples three data mining techniques. Also give applications of these techniques in real life. [CO1][L2] **20**
- Q.3 Discuss role of Big data in:  
a) Healthcare industry.  
b) Education sector. [CO2][L3] **10×2**
- Q.4 a) Explain all the characteristics of big data in detail. [CO1][L2] **10**  
b) Discuss the CAP theorem by taking suitable examples of databases following the properties of CAP theorem. [CO3][L4] **10**

**PART-B**

- Q.5 Explain the following terms in related to architecture of Hadoop:  
i) Name Node ii) Data Node iii) Job Tracker iv) Task Tracker [CO4][L2] **5×4**
- Q.6 Discuss the architecture of Hive. Also discuss important built in functions and built in operators used in Hive. [CO3][L2] **20**

[CO-5] [L3 ] **20**

- Q.7 Explain the concept of Resiliency in databases. Also compare and contrast the following:  
Availability vs Durability vs Reliability vs Resilience. [CO5][L2, L4] **20**

**End Semester Examination, Dec. 2023**  
B. Sc. (Information Technology) – Fifth Semester  
**CYBER SECURITY (BSCIT-DS-502)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1** is **compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

- a) In the asymmetric-key encryption, the number of keys used in the encryption and decryption process are:  
i) 1  
ii) 2  
iii) 3  
iv) 4 [CO3][L1]
- b) Which of the following is a type of cyber security?  
i) Cloud security  
ii) Network security  
iii) Application security  
iv) All of the above [CO1][L1]
- c) A program that copies itself:  
i) Worm  
ii) Trojan  
iii) Virus  
iv) Bomb [CO1][L1]
- d) Which of the following usually observe each activity on the internet of the victim, gather all information in the background, and send it to someone else?  
i) Malware  
ii) Spyware  
iii) Adware  
iv) All of the above [CO1][L1]
- e) A firewall is installed at the point where the secure internal network and untrusted external network meet which is also known as \_\_\_\_\_.  
i) Chock point  
ii) Meeting point  
iii) Firewall point  
iv) Secure point [CO6][L1]
- f) The key of a key pair used to verify a digital signature \_\_\_\_\_.  
i) Public key  
ii) Private key  
iii) Verifying key  
iv) Secret key [CO3] [L1]
- g) In which category does compromising confidential information fall?  
i) Threat  
ii) Bug  
iii) Attack  
iv) Vulnerability [CO5] [L1]
- h) A digital signature is:  
i) A bit string giving identity of a correspondent  
ii) A unique identification of a sender  
iii) An authentication of an electronic record by trying it uniquely to a key only a sender knows  
iv) An encrypted signature of sender [CO2][L1]
- i) IPSec is designed to provide security at the \_\_\_\_\_.  
i) Transport layer  
ii) Network layer  
iii) Application layer  
iv) Session layer [CO1][L1]
- j) Which of the following is considered an element of cyber security?  
i) Network security  
ii) Operational security  
iii) Application security  
iv) All of the above [CO1][L1] **2×10**

**PART-A**

Q.2 What is Network Security? Explain the network devices used for security purpose?

**P.T.O.**

[CO1] [L2] **20**

Q.3 What is IP security architecture? Describe the protocols used for IP Sec? [CO2][L2] **20**

Q.4 a) What are the reasons for securing layer two network? [CO4][L1] **10**

b) What strategies would you use to secure Layer two? [CO4][L2] **10**

**PART-B**

Q.5 a) What is OSPF? Explain its functioning. [CO5][L2] **10**

b) What is EIGRP? Explain the four basic component of EIGRP. [CO5][L1] **10**

Q.6 a) What is firewall? Describe the characteristics of firewall. [CO6][L1] **10**

b) Explain the need and importance of firewall. [CO6][L2] **10**

Q.7 a) What is encryption? How does encryption process actually takes place? [CO3][L2] **10**

b) What is difference between public key and private key used in cryptography?

[CO3][L2] **10**





- Q.14 Pointing to a photograph of a man Kamal said, "He is the son of the only son of my mother." How is Kamal related to that man? [CO-5][L-1]  
 a) Brother                      b) Uncle                      c) Cousin                      d) Father
- Q.15 The average of 30 numbers is zero. Of them, at the most, how many may be greater than zero? [CO-4][L-4]  
 a) 15                              b) 29                              c) 19                              d) 27
- Q.16 Find the sum of the infinite series  $4 + 2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$  [CO-4][L-2]  
 a) 8                              b) 7                              c) 6                              d) 5
- Q.17 In a row, all the persons are facing north. Sarah is 24th from the left end, and on the right side of Sarah, there are only 17 persons. Find out the total number of persons in this queue? [CO-5][L-1]  
 a) 36                              b) 42                              c) 41                              d) 56
- Q.18 If the average marks of three batches of 50, 60 and 40 students respectively is 50, 55, 60, then the average marks of all the students is: [CO-4][L-2]  
 a) 54.66 years                      b) 65.66 years                      c) 57 years                      d) 30 years
- Q.19 X drives 30 km east, then turns right and drives 30 km, then turns left and drives 20 km and then turns left and drives 30 km. How far is X from his/her initial position? [CO-5][L-1]  
 a) 20 km                              b) 30 km                              c) 50 km                              d) 60 km
- Q.20 Solve:  $25 \log 53$  [CO-4][L-1]  
 a) 7                              b) 14                              c) 9                              d) 18
- Q.21 One morning after sunrise, Akash was standing facing a pole. The shadow of the pole fell exactly to his right. To which direction was he facing? [CO-5][L-1]  
 a) East                              b) West                              c) South                              d) North
- Q.22 M is the sister of Z. K is the father of Z. H is the husband of M. How is K related to H? [CO-5][L-1]  
 a) Father                              b) Son in law                              c) Grandmother                              d) Father in law
- Q.23 What is the remainder when  $23 \times 31 \times 48$  is divided by 7? [CO-4][L-4]  
 a) 4                              b) 1                              c) 2                              d) 3
- Q.24 Sameer is 20th from the left end of a row and Arun is 12th from the right end of row. If they interchange their positions, then Arun ranks become 10th from right end. Find total number of persons in the row? [CO-5][L-1]  
 a) 10th                              b) 12th                              c) 15th                              d) None of these
- Q.25 Find the HCF of  $6a^2b^2$ ,  $12b^2c^2$ ,  $18c^2a^2$ . [CO-5][L-1]  
 a) 4                              b) 6                              c) 18                              d) 36

### **PART-B (Soft Skill Section)**

**Directions: In the question a part of the sentence has been highlighted in bold. Alternatives of the highlighted part are given which may improve the construction of the sentence. Select the correct alternative.**

- Q.26 Ronan's family \_\_\_\_\_ coming to the city tomorrow. [CO-2][L-1]  
 a) is                              b) be                              c) are                              d) am
- Q.27 "Where is the entrance to the classroom"? (Choose the correct response) [CO-2][L-1]  
 a) From the behind  
 b) from backside  
 c) at the rear  
 d) from behind side
- Q.28 500 kilometers \_\_\_\_\_ a huge distance to travel within a few hours. [CO-2][L-2]  
 a) is                              b) are                              c) were                              d) none of these
- Q.29 Developing listening skills can be done by [CO-3][L-2]  
 a) Listen to everything passively  
 b) Speak continuously  
 c) Simply focus on listening skills without associating with other language  
 d) Create opportunity to listen to variety of language sources and people

- Q.30 The cloth merchant has purchased two \_\_\_\_\_ of cloth. [CO-2][L-2]  
 a) Bales                      b) Bails                      c) Bials                      d) None of These
- Q.31 For a free writing task which of the following is more important [CO-2][L-1]  
 a) Handwriting  
 b) Accuracy of Content  
 c) Fluency of Content  
 d) 'B' & 'C'
- Q.32 James Bond always drank champagne in the novels although he \_\_\_\_\_ to wine by the time he \_\_\_\_\_ it to the silver screen. [CO-2][L-1]  
 a) had switched / made                      b) has switched / has made  
 c) switched / had made                      d) was switching / would make
- Q.33 Listening, Speaking, Reading and writing skills are [CO-3][L-1]  
 a) Acquired                      b) Learnt                      c) Developed over time                      d) All of above
- Q.34 For the time being, we \_\_\_\_\_ for the exam, but this time tomorrow we \_\_\_\_\_ the best movie of this year. [CO-2][L-1]  
 a) study / will watch                      b) are studying / will be watching  
 c) have been studying / are watching                      d) are studying / will have watched
- Q.35 Some time ago, an interesting discovery \_\_\_ by archaeologists on the Island. [CO-2][L-1]  
 a) had to be made  
 b) has been made  
 c) was made  
 d) used to be made
- Q.36 For me, breakfast is \_\_\_ best meal of the day [CO-2][L-1]  
 a) The                      b) an                      c) is                      d) None of the above
- Q.37 \_\_\_ children recited \_\_\_\_\_ poem in \_\_\_\_\_ honour of \_\_\_\_\_ President [CO-1][L-1]  
 a) the, a, an, a  
 b) a, the, the, the  
 c) no article, a, an, the  
 d) the, a, the, the
- Q.38 While mum \_\_\_ the VCD I hired, I \_\_\_ my assignment. [CO-1][L-1]  
 a) was watching / finished  
 b) is watching / had finished  
 c) will watch / am finishing  
 d) was going to watch / finish
- Q.39 He edits a \_\_\_\_\_ weekly journal. [CO-2][L-1]  
 a) by                      b) buy                      c) bi                      d) bye
- Q.40 \_\_\_\_\_ student should learn from the best expert she or he can [CO-2][L-1]  
 a) A                      b) An                      c) The                      d) No Article
- Q.41 Many shops were set up in \_\_\_\_\_ enclosed area [CO-2][L-1]  
 a) A                      b) An                      c) The                      d) No Article
- Q.42 \_\_\_\_\_ higher you climb \_\_\_\_\_ Colder it gets [CO-2][L-1]  
 a) the, no article  
 b) no article, no article  
 c) no article, the  
 d) the, the
- Q.43 Inclusion regardless of Race, Creed, and Community is a fundamental right. [CO-1][L-1]  
 a) True                      b) False
- Q.44 What does judging other people negatively and seeing them inferior mean? [CO-1][L-1]  
 a) Judice                      b) Prejudice                      c) Post Judice                      d) None of These
- Q.45 What term is the correct term for someone who is disabled? [CO-1][L-1]  
 a) Challenged Person  
 b) Ordinary

- c) Genius  
d) None of These
- Q.46 What happens when people act on their prejudices and stereotypes [CO-1][L-1]  
a) Crimination      b) Happiness      c) Discrimination      d) None of these
- Q.47 Which of the following is not a suitable reason responsible for discrimination? [CO-1][L-1]  
a) Different Religion  
b) Different Language  
c) Different Choice  
d) None of These
- Q.48 People with special needs are NO longer called. [CO-1] [L-2]  
a) Disabled      b) Diverse      c) Unusual      d) Prejudiced
- Q.49 The number of vowel and consonant sounds in English are indicated by: [CO-2][L-2]  
a) 22,22      b) 5, 39      c) 10,34      d) 20,24
- Q.50 Which of the following word is represented by different sound of the two underlined letters? [CO-1][L-1]  
a) CHURCH      b) EACH      c) REACH      d) CHEMIST

**End Semester Examination, Dec. 2023**  
 BCA & B.Sc. (Information Technology) – Third Semester  
**PLACEMENT COMPETENCY ENHANCEMENT-III (CDC-211)**

Time: 1½ hrs.

Max Marks: **50**

No. of pages: 8

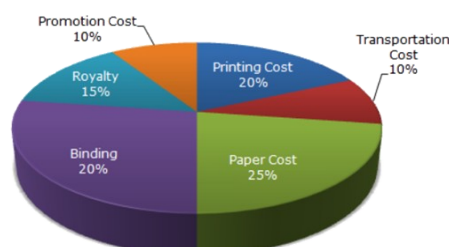
Note: All questions are **compulsory**. Each question has **FOUR** options with **ONE** correct answer. Select the correct answer. All questions are of **ONE** mark each. There is no **NEGATIVE** marking. Mention the correct option for each question in the blank answer key given herein below. Calculator is not permitted.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
41.	42.	43.	44.	45.	46.	47.	48.	49.	50.

**PART-A APTITUDE**

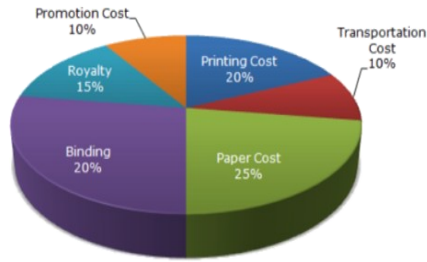
- Q.1 A builder appoints three construction workers Akash, Sunil and Rakesh on one of his sites. They take 20, 30 and 60 days respectively to do a piece of work. How many days will it take Akash to complete the entire work if he is assisted by Sunil and Rakesh every third day?  
 a) 10 days                      b) 15 days                      c) 25 days                      d) 30 days      [CO1] [L1]
- Q.2 To complete a piece of work, Samir takes 6 days and Tanvir takes 8 days alone respectively. Samir and Tanvir took ₹2400 to do this work. When Amir joined them, the work was done in 3 days. What amount was paid to Amir?  
 a) ₹300                      b) ₹400                      c) ₹800                      d) ₹500      [CO1] [L1]
- Q.3 A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:  
 a) 6 hours                      b) 10 hours                      c) 15 hours                      d) 30 hour      [CO1] [L1]
- Q.4 A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.  
 a) 220 km                      b) 224 km                      c) 230 km                      d) 234 km      [CO1] [L1]
- Q.5 The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:  
 a) 70 km/hr                      b) 75 km/hr                      c) 84 km/hr                      d) 87.5 km/hr [CO1] [L1]
- Q.6 The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart and the answer the questions based on it.  
 If for a certain quantity of books, the publisher has to pay ₹30,600 as printing cost, then what will be amount of royalty to be paid for these books?  
 a) ₹19,450                      b) ₹21,200                      c) ₹22,950                      d) ₹26,150      [CO1] [L1]

Various Expenditures (in percentage) Incurred in Publishing a Book




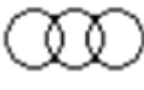


- Q.7 The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart and the answer the questions based on it.

Various Expenditures (in percentage) Incurred in Publishing a Book



The price of the book is marked 20% above the C.P. If the marked price of the book is ₹180, then what is the cost of the paper used in a single copy of the book?

- a) ₹36                      b) ₹37.50                      c) ₹42                      d) ₹44.25                      [CO1] [L1]
- Q.8 If the letters in PRABA are coded as 27595, and THILAK are coded as 368451, how can BHARATHI be coded?  
a) 96575368                      b) 57686535                      c) 37536689                      d) 96855368 [CO1] [L1]
- Q.9 If ROOM is called BED, BED is called WINDOW, WINDOW is called FLOWER and FLOWER is called COOLER, on what would a man sleep?  
a) WINDOW                      b) BED                      c) FLOWER                      d) COOLER                      [CO1] [L1]
- Q.10 How many times in the hands of the clock at a right angle in one day?  
a) 24                      b) 22                      c) 48                      d) 44                      [CO1] [L1]
- Q.11 What was the day of the week on 28th May, 2006?  
a) THURSDAY                      b) FRIDAY                      c) SATURDAY                      d) SUNDAY                      [CO1] [L1]
- Q.12 Four usual dice are thrown on the ground. The total of numbers on the top faces of these four dice is 13 as the top faces showed 4, 3, 1 and 5 respectively. What is the total of the faces touching the ground?  
a) 12                      b) 13                      c) 15                      d) Cannot be determined                      [CO1] [L1]
- Q.13 The four different positions of a dice are given below: Find the number on the face opposite the face showing 6?  
a) 1                      b) 2                      c) 4                      d) 5                      [CO1] [L1]
- Q.14 Which of the following diagrams indicates the best relation between Hockey, Football and Cricket?  
a)                       b)                       c)                       d)  [CO1] [L1]
- Q.15 In the following figure small square represents the persons who know English, triangle to those who know Marathi, big square to those who know Telugu and circle to those who know Hindi. In the different regions of the figures from 1 to 12 are given.

[CO-1] [L-1]



- Q.20 Four of the ships sought a passage along a southern \_\_\_\_\_.  
a) Coast  
b) inland  
c) Body of land with water on three sides  
d) border

**Direction (Q.21-Q.23):** Give the most appropriate antonyms for underlined words in the sentences given below: [CO4][L2]

- Q.21 Since the judges did not have irrefutable evidence, they could not find the defendant guilty of the crime.  
a) Disputable      b) Indefinite      c) Beyond question      d) Unassailable
- Q.22 Unfortunately, Sameeksha eventually reverted into a provoking posture, evident in the middle of the conversation.  
a) Palpable      b) Obvious      c) Concealed      d) Definite
- Q.23 The catalyst for a new plan should be the instant restructuring and recapitalization of the whole system stating a clear timeframe.  
a) Ancestor      b) Cause of a process      c) Hindrance      d) Bright colour

**Direction:** Choose the correct option which is most nearly the closest in meaning of the underlined word or phrase. [CO4][L3]

- Q.24 An individual unrestrained by the rules of morality or tradition is called a licentious person.  
a) libertine      b) loafer-type      c) criminal      d) freelance

**Direction:** Choose the option which will correctly fill the blank.

- Q.25 I don't think these flowers are \_\_\_\_\_ to Sri Lanka. At least I've never seen them.  
a) ingenuous      b) fluent      c) habitat      d) indigenous
- Q.26 What does the "Open to Work" feature on LinkedIn indicate to recruiters?  
a) You are quitting your job      b) You are unavailable for new opportunities  
c) You are planning a vacation      d) You are actively seeking job opportunities
- Q.27 What is the primary purpose of a cover letter when applying for a job?  
a) To list your personal hobbies  
b) To discuss unrelated topics  
c) To discuss unrelated topics  
d) To introduce yourself and express your interest in the position
- Q.28 What is the purpose of a "Reply" in email, and when should you use it?  
a) To send a new email  
b) To acknowledge an email without providing a response  
c) To delete an email  
d) To respond to an email and continue the conversation
- Q.29 Which file format is generally preferred when submitting your resume electronically?  
a) .TXT      b) .PDF      c) .DOCX      d) .JPEG
- Q.30 What should be the tone of your speech in a group discussion?  
a) Aggressive and confrontational      b) Passive and unassertive  
c) Confident and respectful      d) Sarcastic and humorous
- Q.31 Which of the following is a common mistake to avoid in a group discussion?  
a) Listening actively to others      b) Interrupting other participants

- c) Staying focused on the topic                      d) Building on others' points

Q.32 What is the purpose of a "salutation" in a professional letter or email?  
a) To introduce yourself  
b) To greet the recipient and establish a polite tone  
c) To close the message  
d) To provide contact information

Q.33 Which of the following is an example of a professional networking platform?  
a) Instagram      b) LinkedIn                      c) Snapchat                      d) TikTok

Q.34 What does the term "ROI" stand for in Corporate Lingo?  
a) Return on Investment                      b) Return on Income  
c) Revenue Over Inflation                      d) Risk of Investment

Q.35 How do you prioritize tasks and manage your time effectively?  
a) I don't prioritize; I do whatever comes to mind first  
b) I use a to-do list and set deadlines for each task.  
c) I procrastinate until the last minute.  
d) I ask my superiors to prioritize for me.

***PART-C (Technical Section)***

Q.36 What is the output of the following Java code?

```
public static void main(String args[]){  
    int[] arr = {11,22,33,44,55};  
    System.out.println(arr[5]);  
}
```

- a) 4    b) 5  
c) ArrayIndexOutOfBoundsException      d) None of the above                      [CO3] [L2]

Q.37 A programmer writes the program given below to print the sum of the first ten multiples of 5. What should be the "Missing Statement 5"?

```
int i = 0;  
int sum = 0;  
while (i<=50){  
    sum = sum + i;  
    __ Missing Statement 5 __  
}  
System.out.println(sum);
```

- a) i=5;                      b) i=i+5                      c) i=i\*5;                      d) i=i+1;                      [CO3] [L2]

Q.38 A programmer wants to print the following pattern on the screen:

```
1  
1 2  
1 2 3
```

He writes the following program:

```
int row=1; //statement1  
int nst=1; //statement2  
while(row<=3){  
    for(int cst=1;cst<=nst;cst++){  
        System.out.print(nst + " "); //statement3  
    }  
    nst=nst+1; //ststatement4  
    System.out.println();//takes the cursor to the nextline  
    row=row+1;
```



```

    }
    Which statement is incorrect
    a) statement1    b) statement2    c) statement3    d) statement4    [CO3]
    [L2]

```

Q.39 A programmer prepares a questionnaire with "true" or "false" type of questions. He wants to define a data type that stores the responses of the candidates for questions. Which of the following is the most suited data type for this purpose?

a) integer          b) boolean          c) float          d) character [CO3] [L2]

Q.40 The time complexity of linear search algorithm over an array of n elements is:

a) O(n)          b) O(log n)          c) None of the above          d) O(n<sup>2</sup>) [CO3] [L2]

Q.41 The program to print the sum of all cubes that lie between 0 & 100 is given below. Does this program have any error? If yes, which statement should be modified to correct the program?

```

    int i=0, a; //Statement 1
    int sum =0;
    a=(i*i*i);
    while(i<100) //Statement 2
    {
    sum=sum+a; // Statement 3
    i=i+1;
    a=(i*i*i) // Statement 4
    }
    System.out.println(sum);
    a) Statement 1    b) Statement 2    c) Statement 3    d) Statement 4    [CO3]
    [L2]

```

Q.42 What is the output of the following Java code?

```

    public static void solve() {
    int a[] = {10, 20, 30, 40, 50};
    int sum = 0;
    for(int i = 0; i < 5; i++) {
    if(i % 2 == 0) {
    sum += a[i];
    }
    }
    System.out.println(sum);
    }
    a) 50          b) 150          c) 90          d) 60          [CO3] [L2]

```

Q.43 Given the string "GOODMORNING" saved in a variable called str, what would str.substring(3, 6) return?

a) ODMO          b) ODM          c) DMOR          d) DMO [CO3] [L2]

Q.44 What is the output of the following Java code?

```

    public class exception {
    public static void main(String[] args) throws Exception {
    int a = 10;
    int b= 0;
    if(b ==0) {
    throw new Exception("Cannot divide by 0");
    }
    }

```



```
        System.out.print("Static method"+" ");
    }
}
```

- a) Static block Static method                      b) Static block  
c) Static method                                      d) Static method Static block                      [CO3] [L2]

Q.49 What is the output of the following Java code?

```
class MainClass {
    final String message() {
        return "Hello!";
    }
}
class M7 extends MainClass {
    public static void main(String[] args) {
        System.out.println(message());
    }
}
```

- a) Hello    b) compilation error  
c) Hello!    d) none of the above                                      [CO3] [L2]

Q.50 Consider a one dimensional array Arr[15]. Assume 4 words per memory cell, the base address of array A is 250. The first element is A[0]. What is the address of A[8].

- a) 32                      b) 282                      d) none of the above c) 28                      [CO3] [L2]

# End Semester Examination, Dec. 2023

MCA – First Semester

## PLACEMENT COMPETENCY ENHANCEMENT- I (CDC-511)

Time: 1½ hrs.

Max Marks: **50**

No. of pages: 6

Note: All questions are compulsory. Each question has **FOUR** options with **ONE** correct answer. Select the correct answer. All questions are of **ONE** mark each. There is no **NEGATIVE** marking. Mention the correct option for each question in the blank answer key given herein below. Calculator is not permitted.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
41.	42.	43.	44.	45.	46.	47.	48.	49.	50.

### ***PART-A (Aptitude Section)***

- Q.1 A person incurs a loss of 5% by selling a watch for Rs. 1140. At what price should the watch be sold to earn 5% profit. [CO – 5][L-1]  
a) Rs.1200                      b) Rs.1230                      c) Rs.1260                      d) Rs.1290
- Q.2 If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is? [CO – 5][L-1]  
a) 12%                              b) 30%                              c) 50%                              d) 60%
- Q.3 In a college, the ratio of the number of boys to girls is 8 : 5. If there are 160 girls, the total number of students in the college is? [CO – 5][L-2]  
a) 100                              b) 260                              c) 250                              d) 416
- Q.4 The incomes of two persons A and B are in the ratio 3 : 4. If each saves Rs.100 per month, the ratio of their expenditures is Rs. 1 : 2. Find their incomes. [CO – 5][L-1]  
a) Rs. 100 and Rs.150                      b) Rs. 150 and Rs.200  
c) Rs.200 and Rs.250                      d) Rs.250 and Rs.300
- Q.5 Raman's salary was decreased by 50% and subsequently increased by 50%. How much percent does he lose. [CO – 5][L-1]  
a) 75                              b) 65                              c) 45                              d) 25
- Q.6 Total number of boys and girls in a school is 150. If the number of boys is x, then girls become x% of the total number of students. The number of boys is [CO – 5][L-1]  
a) 50                              b) 60                              c) 70                              d) 80
- Q.7 Teacher took exam for English, average for the entire class was 80 marks. If we say that 10% of the students scored 95 marks and 20% scored 90 marks, then calculate average marks of the remaining students of the class? [CO – 6][L-2]  
a) 60                              b) 70                              c) 75                              d) 80
- Q.8 Which one of the following numbers is completely divisible by 45? [CO – 6][L-1]  
a) 181560                      b) 331145                      c) 202860                      d) 2033555
- Q.9 Rahul walks 80 m towards south. Then, turns to his right & starts walking straight till he completes another 80 m. Then, again turning to his left he walks for 60 metres. He then turns to his left & walks for 80 metres. How far is he from his initial position? [CO – 6][L-2]  
a) 100 metres                      b) 60 metres                      c) 20 metres                      d) None of these
- Q.10 One morning after sunrise, Amrit was standing facing a pole. The shadow of the pole was forming on the left side. Which direction was Amrit facing? [CO – 6][L-1]  
a) East                              b) West                              c) North                              d) South

- Q.11 One evening just before sunset two friends Sanju and Manju were talking to each other face to face. If Manju's shadow was exactly to her left side, which direction was Sanjufacing? [CO – 5][L-1]  
 a) North                      b) South                      c) West                      d) Data inadequate
- Q.12 Rahul told Anand, 'Yesterday I defeated the only brother of the daughter of my grandmother.' Whom did Rahul defeat? [CO – 5][L-1]  
 a) Son                      b) Father                      c) Brother                      d) Father-in law
- Q.13 All the six members of a family A, B, C, D, E and F are travelling together. B is the son of C but C is not the mother of B. A and C are a married couple. E is the brother of C. D is the daughter of A. F is the brother of B. Who is the mother of B? [CO – 5][L-1]  
 a) D                      b) F                      c) B                      d) D. A
- Q.14 Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it? [CO – 6][L-1]  
 a) His uncle's                      b) His nephew's                      c) His son's                      d) His Cousin's
- Q.15 Find the unit digit of  $(76)234 \times (431)124$ ? [CO – 6][L-1]  
 a) 6                      b) 5                      c) 3                      d) 1

***PART-B (Verbal Ability + Soft Skill Section)***

- Q.16 Fill in the blank with the correct form of the verb. No news \_\_\_\_\_ good news. [CO-1] [L-1]  
 a) are                      b) is                      c) had                      d) takes
- Q.17 Fill in the blank with the correct form of the verb. The strain of all the difficulties and vexations \_\_\_\_\_ more than he could bear. [CO-1] [L-1]  
 a) has                      b) are                      c) was                      d) were
- Q.18 Fill in the blank with the correct option. The headmaster \_\_\_\_\_ to speak to you. [CO-1] [L-1]  
 a) wants                      b) is wanting                      c) was wanting                      d) had wanting
- Q.19 Fill in the blank with the correct option. I \_\_\_\_\_ English for the past five years. [CO-1] [L-1]  
 a) Study                      b) am studying                      c) have been studying                      d) have studying
- Q.20 Choose the correct sentence out of the following options. [CO-2] [L-1]  
 a) I like to read, write and analyzing fictional books.  
 b) His performance was better than the other boy.  
 c) The evening consisted of dancing, interacting and creating memories.  
 d) I'm headed to the supermarket for milk, eggs and buying utensils.
- Q.21 Which level of reading includes thinking processes such as drawing logical conclusions, making generalizations and predicting outcomes? [CO-2] [L-3]  
 a) Literal                      b) Interpretive                      c) Applied                      d) None of these.
- Q.22 A sentence that expresses a strong feeling is called? [CO-2] [L-3]  
 a) Exclamatory                      b) Declarative                      c) Imperative                      d) Assertive
- Q.23 Which of the following is a compound sentence? [CO-2] [L-3]  
 a) The moon was shining.  
 b) The moon was bright and we could see our way.  
 c) We could see our way.  
 d) None of these.
- Q.24 A paragraph which involves the concept of storytelling is called? [CO-2] [L-3]  
 a) Expository                      b) Descriptive                      c) Narrative                      d) Imaginative
- Q.25 Which of the following options are characteristic effective email writing? [CO-2] [L-3]  
 a) An informative subject line  
 b) Adhering to brevity  
 c) Proofreading  
 d) All of these.

- Q.26 What does the "S" stand for in SMART goals? [CO-1] [L-1]  
a) Simple                      b) Specific                      c) Significant                      d) Sustainable
- Q.27 Why is effective communication a critical skill for leaders? [CO-1] [L-1]  
a) To confuse team members and maintain authority  
b) To create misunderstandings and conflicts  
c) To convey a clear vision, expectations, and goals  
d) To withhold information and maintain control.
- Q.28 Which of the following is a key benefit of effective time management?  
a) Increased stress and anxiety  
b) Decreased productivity  
c) Frequent missed deadlines  
d) Improved efficiency and reduced stress
- Q.29 What is the importance of maintaining eye contact during a self-introduction?  
a) It is not important at all  
b) It helps establish trust and connection with the audience  
c) It makes the audience uncomfortable  
d) Improved efficiency and reduced stress
- Q.30 What should the first paragraph of a cover letter typically include?  
a) Your contact information  
b) A brief introduction and the position you're applying for  
c) A summary of your qualifications  
d) A list of your hobbies and interests
- Q.31 Why should you avoid using excessive capitalization in emails?  
a) It adds emphasis and clarity to the message  
b) It is considered professional  
c) It can be perceived as shouting  
d) It is a requirement for all emails
- Q.32 How can appropriate power dressing impact your self-confidence?  
a) It has no impact on self-confidence  
b) Dressing inappropriately can boost self-confidence  
c) It shows professionalism  
d) Dressing casually is the key to self-confidence
- Q.33 What is the importance of practicing good posture during an interview?  
a) It doesn't matter; posture has no impact  
b) It conveys confidence and professionalism  
c) Good posture is uncomfortable  
d) Slouching is preferred in interviews
- Q.34 Why should you avoid speaking too fast during a group discussion?  
a) Speaking quickly is preferred  
b) To keep the discussion short  
c) Speaking quickly is a sign of confidence  
d) To ensure clarity and comprehension of your points
- Q.35 In the "Skills" section of a resume, what type of skills should be highlighted?  
a) Personal hobbies  
b) Technical skills and Soft Skills  
c) A list of books you've read  
d) About memorable days

***PART-C (Technical Section)***

- Q.36 Given the string "Washington" saved in a variable called state, what would state.substring(2, 5) return? [CO-3] [L-2]  
a) shin                      b) shi                      c) ashi                      d) ashing

- Q.37 What method signature will work with this code? [CO-3] [L-2]  
 boolean healthyOrNot = isHealthy("apple");  
 a) public void isHealthy(String avocado)  
 b) public isHealthy("avocado")  
 c) public boolean isHealthy(String fruit)  
 d) private String isHealthy(String food)
- Q.38 Predict the output of the following Java program. [CO-3] [L-2]  

```

class T {
    int t = 20;
    T() {
        t = 40;
    }
}
class Main {
    public static void main(String args[]) {
        T t1 = new T();
        System.out.println(t1.t);
    }
}

```
- a) 40                      b) 20                      c) Both A and B                      d) Compilation Error
- Q.39 What value should y have to make this loop execute 10 times? [CO-3] [L-2]  
 for(int i=0; i<30; i+=y) { //code }
- a) 10                      b) 1                      c) 0                      d) 3
- Q.40 Consider a two dimensional array A[20][10]. Assume 4 words per memory cell, the base address of array A is 100, elements are stored in row-major order and the first element is A[0][0]. What is the address of A[11][5]? [CO-3] [L-2]  
 a) 460                      b) 440                      c) 560                      d) None of the above
- Q.41 What will be the output of the following code snippet? [CO-3] [L-2]  

```

void solve() {
    int a[] = {1, 2, 3, 4, 5};
    int sum = 0;
    for(int i = 0; i < 5; i++) {
        if(i % 2 == 0) {
            sum += a[i];
        }
    }
    System.out.println(sum);
}

```
- a) 9                      b) 6                      c) 15                      d) 5
- Q.42 What is the purpose of the "this" keyword in Java? [CO-3] [L-2]  
 a) To create multiple instances of a class  
 b) To refer to the superclass  
 c) To hide data and methods within a class  
 d) To refer to the current object
- Q.43 What will be the output of the below code snippet if arr[ ] = {1,3,5,7,9} [CO-3] [L-2]  
 start = 0, end = arr.length-1;  

```

public void myArray(int arr[], int start, int end) {
    int temp;
    if (start >= end) {
        return;
    }
    temp = arr[start];
    arr[start] = arr[end];
}

```

```
arr[end] = temp;
myArray(arr, start + 1, end - 1);
```

- }  
 a) 1,3,5,7,9                      b) 9,7,5,3,1                      c) 3,5,1,9,7                      d) 7,5,3,9,1

Q.44 What will be the output of the below code snippet, if rows = 3 and k=1? [CO-3] [L-1]

```
public static void main(String args[]) {
int rows = 3;
int k = 1;
for (inti = 1; i<= rows; i++) {
for (int j = 1; j <= i; j++) {
System.out.print(k + " ");
k = k + 2;
}
System.out.println();
}
}
```

- a) 1                                      b) 1                                      c) 1                                      d) 1  
    3 5                                      3 5 7                                      5 9                                      2 3  
    7 9 11                                      9 11 13                                      13 17 21                                      4 5 6

Q.45 Arrange the following primitive data types in the ascending order [CO-3] [L-1]

Char, int,long,byte

- a) byte,char,int,long  
 b) int,byte,char,long  
 c) char,byte,int,long  
 d) long,char,int,byte

Q.46 Suggest the output. [CO-3] [L-2]

```
public static void main(String[] args){
int a = 5;
a +=5;

switch(a){

case 5: System.out.print("5");break;
case 10: System.out.print("10");
System.out.println(((a%2 ==0) ? "-even-" : "-odd-"));
break;

default: System.out.print("0");

}
}
```

- a) Compilation Error    b) B. 10-even-                      c) 10-even-0                      d) 0-odd

Q.47 What will be the output of the following Java program? [CO-3] [L-2]

```
classString_demo
{
public static void main(String args[])
{
char chars[] = {'a', 'b', 'c'};
String s = new String(chars);
System.out.println(s);
}
}
```



- a) a                      b) b                      c) c                      d) abc
- Q.48 In order to restrict a variable of a class from inheriting in the subclass, how should a variable be declared? [CO-3] [L-1]
- a) public                      b) private                      c) protected                      d) static
- Q.49 What is the purpose of the "final" keyword in Java? [CO-3] [L-1]
- a) To prevent the inheritance of a class  
b) To prevent overriding of a method  
c) To prevent modification of a variable's value  
d) All of the above
- Q.50 What will be the output of the following code snippet? [CO-3] [L-2]
- ```
public static void main(String[] args){  
int a = 100;  
System.out.println(a*a--);  
System.out.println(a);  
}
```
- a) 10000,98                      b) 10000,99                      c) 10000,100                      d) 10000

**End Semester Examination, Dec. 2023**  
MCA Third Semester  
**ADVANCE DATABASE SYSTEMS (MCA –DS-502)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Write a note on Enhanced ER tools. [CO-6][L-1]
- b) What are the main features of a good relational DBMS? [CO-2][L-1]
- c) Define spatial database. [CO-2][L-1]
- d) Differentiate between data mining and data warehousing. [CO-3][L-1]
- e) What is a relational operation in SQL? [CO-3][L-1]
- f) What is an SQL view? [CO-3][L-1]
- g) Differentiate between homogeneous and heterogeneous DDBMS. [CO-2][L-1]
- h) Define replication server. [CO-4][L-1]
- i) What are the different levels of database security? [CO-4][L-1]
- j) Give examples of E- security [CO-4][L-1] **2×10**

**PART-A**

- Q.2 a) Explain specific features of relational database management system. [CO-2][L-2] **10**  
b) Write down various constraints applicable at row level as well as at table level along with their description. [CO-3][L-2] **10**
- Q.3 a) Explain the query processing in a database system along with diagrammatic representation. [CO-1][L-2] **10**  
b) Differentiate between Temporal and deductive databases. [CO-1][L-2] **10**
- Q.4 a) Explain different sections of PL/SQL. Why PL/SQL is needed? [CO-3][L-2] **10**  
b) Write a PL/SQL code to find and print the smallest of three numbers. [CO-3][L-3] **10**

**PART-B**

- Q.5 a) Explain distributed concurrency management [CO-2][L-2] **10**  
b) Differentiate between homogeneous and heterogeneous DDBMS [CO-2][L-2] **10**
- Q.6 a) Explain access control in DDBMS. [CO-2][L-2] **10**  
b) Explain different challenges in database security. [CO-4][L-2] **10**
- Q.7 a) Differentiate between enhanced lock-based and Timestamp-based protocols [CO-2][L-2] **10**  
b) Explain the weak levels of consistency. [CO-2][L-2] **10**

# End Semester Examination, Dec. 2023

MCA – First Semester

## CONCEPTS OF AI AND MACHINE LEARNING (MCA-AI-001)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

### Q.1 **Multiple choice questions:**

- a) Predicting whether a tumour is malignant or benign is an example of? [CO-1] [L-1]  
i) unsupervised learning ii) unsupervised regression problem  
iii) supervised classification problem iv) categorical attribute
- b) How many types of AI is there? [CO-3] [L-1]  
i) 2 ii) 3 iii) 4 iv) 5
- c) Which of the following is an application of AI? [CO-1] [L-1]  
i) Gaming ii) Expert Systems iii) Vision Systems iv) All of the above
- d) Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging? [CO-2][L-1]  
i) Decision Tree ii) Regression iii) Classification iv) Random Forest
- e) Machine Learning algorithms build a model based on sample data, known as: [CO-1][L-2]  
i) Training data ii) Transfer data  
iii) None of the above iv) All of the above
- f) This refers to the transformations applied to the identified data before feeding the same into the algorithm. [CO-3][L-3]  
i) Problem identification ii) Identification of required data  
iii) Data pre-processing iv) Defining training data set
- g) What is the difference between supervised and unsupervised learning? [CO-1][L-4]  
i) Supervised learning requires labeled data while unsupervised learning does not.  
ii) Unsupervised learning requires labeled data while supervised learning does not.  
iii) Supervised learning does not require data while unsupervised learning does.  
iv) There is no difference between supervised and unsupervised learning.
- h) Which of the following is true about SVM? [CO-2][L-3]  
i) It is useful only in high-dimensional spaces  
ii) It requires less memory  
iii) SVM does not perform well when we have a large data set  
iv) SVM performs well when we have a large data set
- i) Which of the following is an example of unsupervised learning problem? [CO-4][L-2]  
i) Predicting the stock market ii) Recommending products to users  
iii) Spam filtering iv) Sentiment analysis
- j) We can define this probability as  $p(A|B) = p(A,B)/p(B)$  if  $p(B) > 0$  [CO-5] [L-2]  
i) conditional probability ii) marginal probability  
iii) Bayes probability iv) normal probability **2×10**

### **PART-A**

### Q.2 Answer the following:

- a) What is the difference between Supervised and Unsupervised learning?
- b) What is the difference between Strong Artificial Intelligence and Weak Artificial Intelligence?
- c) List some applications of AI in real life.
- d) What is Turing Test? [CO-3] [L-2] **5×4**

**P. T. O**

Q.3 Classification and regression are both supervised machine learning algorithms. Differentiate between these two with the help of suitable examples. [CO-2] [L-2] **20**

Q.4 What is Linear Regression? What is meant by dependent and independent variable in linear regression? Explain the working of linear regression algorithm with the help of a suitable example. Draw neat diagram to support your answer. [CO-2][L-2] **20**

### **PART-B**

Q.5 Answer the following:

a) What is Artificial Neural Network?

b) What are the different types of Artificial Neural Network?

c) How do Neural Networks work?

d) What is Perceptron Learning algorithm in ANN?

[CO-4] [L-2] **5×4**

Q.6 How can you compare reinforcement learning with other Machine learning models? Which type of problems can be solved with the help of this learning technique? What are the main challenges with reinforcement learning? [CO-4] [L-2] **20**

Q.7 What is a Decision Tree in Machine Learning? What are the advantages of using a decision tree? Explain the concept of entropy in the context of decision tree? [CO-4][L-2] **20**

**End Semester Examination, Dec 2023**  
MCA – First Semester  
**INTRODUCTION TO BLOCK CHAIN (MCA-BC-001)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: **1**

*Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.*

Q.1 Explain the following:

- a) Smart contract.
- b) Bitcoin.
- c) Shared ledger.
- d) Hashcash.
- e) Permission in blockchain.
- f) Mining pools.
- g) Proof of work.
- h) Hyper ledger.
- i) Protocol.
- j) Important of hash value in blockchain.

[CO1,2,3,4] [L-1] **2×10**

**PART A**

- Q.2 a) What is block chain? How blockchain makes things tamper-proof? [CO1][L-1] **10**  
b) Explain in detail about centralized, decentralized and distributed systems with a neat diagram. [CO2][L-2] **10**
- Q.3 a) Why cryptographic primitives are needed? [CO2][L-4] **10**  
b) How does blockchain impact security and what is the security risk in blockchain? [CO-1][L-2] **10**
- Q.4 a) What is the need of consensus algorithms in blockchain and explain proof-of-work (PoW) and proof-of-burn (PoB) algorithms in detail? [CO3][L-1] **10**  
b) Explain asymmetric cryptography in blockchain. [CO3][L-2] **10**

**PART B**

- Q.5 a) How does hyper ledger fabric work? [CO3][L-2] **10**  
b) What are the components of hyperledger composer? [CO3][L-1] **10**
- Q.6 a) List the various applications of blockchain in capital markets and KYC. [CO4][L-1] **10**  
**b) Why non fungible token are foolproof?** [CO4][L-2] **10**
- Q.7 How blockchain is changing the supply chain sector? Give a detailed case study of "blockchain in supply chain management". [CO4][L-3] **20**

# End Semester Examination, Dec. 2023

MCA – First Semester

## CYBER SECURITY (MCA-CS-002)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) What do you mean by the term 'cryptanalyst'? [CO1] [L1]
- b) Why is asymmetric cryptography bad for huge data? Specify the reason. [CO4] [L2]
- c) Explain the modes of operation of IP security. [CO4] [L2]
- d) Compare active and passive attacks. [CO3] [L2]
- e) What are the steps to be followed for protection against backdoor? [CO3] [L2]
- f) Explain the main difference between Diffie-Hellman and RSA algorithm [CO5] [L2]
- g) List four types of DoS attacks. [CO3] [L2]
- h) What is the difference between substitution and transposition technique? [CO4] [L2]
- i) What do you mean by IP security policy? [CO4] [L2]
- j) How digital signatures differs from authentication protocols? [CO5] [L4] **2×10**

### **PART-A**

- Q.2 a) What do you understand by cybercrime? Also discuss the different issues and challenges of cybercrime? [CO1] [L1] **10**  
b) Explain unique features of Indian IT Act 2000. [CO1] [L2] **10**
- Q.3 a) What is the importance of HTTPS? Explain the connection initiation and closure of HTTP in detail. [CO2] [L2] **10**  
b) What is Brute Force attack? Explain the various tools used to protect against this attack. [CO2] [L3] **10**
- Q.4 a) What is a firewall? Explain the need to install firewall for Linux based systems. [CO3] [L3] **10**  
b) What is Virtual Private Network (VPN)? Discuss its different types. [CO3] [L3] **10**

### **PART-B**

- Q.5 a) How do you create ciphers and secret messages using cryptographic techniques? Explain in detail with example. [CO4] [L2] **10**  
b) What are the different security attacks and services in cryptography? Explain. [CO4] [L2] **10**
- Q.6 a) What are digital certificates? How do we use them for network security? [CO5] [L2] **10**  
b) What is the importance of security protocols in cyberspace? Explain any two web security protocols in detail with example. [CO5] [L4] **10**
- Q.7 a) What are hardware key loggers and anti-key loggers? List the advantages of using anti loggers. [CO5] [L3] **10**  
b) Discuss on password cracking mechanism in detail with example. [CO4] [L2] **10**



- x) In machine learning, what is the training data used for? [CO-3][L-1]  
a) Testing the model  
b) Evaluating model performance  
c) Teaching the model to make predictions  
d) Visualizing data **2×10**

[CO-1] [L-1] 2x10=20

**PART-A**

- Q.2 a) Describe the life cycle of data science with neat diagram. [CO-1][L-1] **10**  
b) Define "data pre-processing" in the context of data science. Provide an example of a pre-processing task. [CO-1] [L-2] **10**
- Q.3 a) Explain control structures in R with example. [CO-2][L-2] **10**  
b) Describe the data pre-processing steps you would follow when dealing with a dataset that contains missing values, outliers, and duplicate entries. [CO-2][L-3] **10**
- Q.4 a) How can you handle missing data in a dataset using Python? Provide examples of techniques and libraries commonly used for this purpose. [CO-3][L-4] **10**  
b) Describe the main objectives of EDA in data science. What Python libraries and techniques can be applied to perform EDA on a dataset? [CO-3][L-4] **10**

**PART-B**

- Q.5 a) Explain the difference between supervised and unsupervised learning in machine learning. [CO-5][L-3] **10**  
b) What is feature engineering in the context of data science, and why is it important? [CO-4][L-2] **10**
- Q.6 a) What is data cleansing why is it important explain with suitable example. [CO-4][L-3] **10**  
b) Discuss the significance of data visualization in data science. How can effective data visualization aid in data exploration and communication of insights? [CO-5][L-4] **10**
- Q.7 Discuss the ethical considerations in data science and machine learning. Provide examples of ethical issues that can arise during the data science process and explain how they can be addressed. [CO-5][L-5] **20**



# End Semester Examination, Dec. 2023

MCA – First Semester

## FUNDAMENTAL OF COMPUTER PROGRAMMING (MCA-DS-001)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

### Q.1 **Multiple choice questions:**

- a) Which of the following is the correct definition of Computer? [CO1][L1]  
i) Computer is a machine or device that can be programmed to perform arithmetical or logic operation sequences automatically  
ii) Computer understands only binary language which is written in the form of 0s & 1s  
iii) Computer is a programmable electronic device that stores, retrieves, and processes the data  
iv) All of the mentioned
- b) The process of drawing a flowchart for an algorithm is called \_\_\_\_\_ [CO1][L1]  
i) Performance ii) Evaluation  
iii) Algorithmic Representation iv) Flowcharting
- c) Which of the following is the device used for converting maps, pictures, and drawings into digital form for storage in computers? [CO1][L1]  
i) Image Scanner ii) Digitizer iii) MICR iv) Scanner
- d) Which of the following can access the server? [CO1][L1]  
i) Web Client ii) User iii) Web Browser iv) Web Server
- e) How many times the following code prints the string "hello"? [CO1][L1]  
for(i=1;i<=50;i++)  
printf("Hello");  
i) 1 ii) 50 iii) Zero iv) None of them
- f) The first expression in a for... loop is [CO4][L1]  
i) Step value of loop ii) Value of the counter variable  
iii) Condition statement iv) None of the above
- g) A software that can be freely accessed and modified. [CO5][L1]  
i) Synchronous Software ii) Package Software  
iii) OSS iv) Middleware
- h) Which of the following service allows a user to log in to another computer somewhere on the Internet? [CO3][L1]  
i) e-mail ii) UseNet iii) Telnet iv) FTP
- i) An example of a web design OSS. [CO5][L1]  
i) Nvu ii) KOffice iii) AbiWorld iv) Open Office
- j) A program that can retrieve files from the world wide web and render text, images or sounds encoded in the files. [CO1][L1]  
i) Browser ii) Internet iii) Server iv) Web Server **2×10**

### **PART-A**

- Q.2 a) Compare and Contrast Procedural and object-oriented Programming. [CO1][L2] **10**  
b) Illustrate the utility of System development life cycle in software development. [CO2][L2] **10**

**P. T. O**

- Q.3 a) Differentiate between Error and exception. Discuss various types of errors. [CO2][L2] **10**  
b) Develop a program in Python to find the factorial of n number? [CO2][L2] **10**
- Q.4 a) What is Flowchart? Describe symbols used to draw flowchart. Draw a flowchart to chart f admission in hospital. [CO3][L1] **10**  
b) Write the syntax and example of the following:  
i) For loop.  
ii) Do loop [CO3][L1] **10**

**PART-B**

- Q.5 a) Give the difference between java and python. [CO3][L3] **10**  
b) Briefly explain the use of php in web development? [CO4][L2] **10**
- Q.6 a) Differentiate between open-source software and licensed software? [CO5][L3] **10**  
b) Illustrate the philosophy, methodologies and standards of Open-source software. [CO5][L3] **10**
- Q.7 Describe the difference between server side vs. client side programming. [CO3][L-4] **20**

**End Semester Examination, Dec. 2023**  
MCA – First Semester  
**ELEMENTS OF MATHEMATICS (MCA-DS-002)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 a) If a set  $A$  has  $n$  elements, then the total number of subsets of  $A$  is [CO4][L1]  
i)  $n$  ii)  $n^2$  iii)  $2^n$  iv)  $2n$
- b) Let  $S = \{1, 5, 4, 7\}$ . Then the total number of subsets of  $S$  is [CO4][L2]  
i) 16 ii) 32 iii) 40 iv) 20
- c) If  $A = \{1, 2, 4\}$ ,  $B = \{2, 4, 5\}$ ,  $C = \{2, 5\}$ , then  $(A - B) \times (B - C)$  is [CO4][L2]  
i)  $\{(1, 2), (1, 5), (2, 5)\}$  ii)  $\{(1, 4)\}$   
iii)  $(1, 4)$  iv) None of these
- d) Given set  $A = \{a, b, c\}$ . A reflexive relation in set  $A$  is [CO4][L2]  
i)  $R = \{(a, b), (a, c)\}$  ii)  $R = \{(a, a), (b, b), (c, c)\}$   
iii)  $R = \{(a, a), (b, b), (c, c), (a, c)\}$  iv)  $R = \{(c, a), (b, a), (a, a)\}$
- e) Let  $R$  be a relation defined as  $R = \{(x, x), (y, y), (z, z), (x, z)\}$  in set  $A = \{x, y, z\}$  then  $R$  is (reflexive/symmetric) relation.(True/False) [CO4][L2]
- f) If  $A = \begin{bmatrix} -3 & 8 \\ 3 & 5 \end{bmatrix}$ . Find  $A^2$  [CO1][L3]
- g) If a matrix  $A$  is of order  $2 \times 3$  and matrix  $B$  is of order  $3 \times 2$ , then order of  $AB$  is: [CO1][L2]  
i)  $2 \times 2$  ii)  $4 \times 3$  iii)  $3 \times 4$  iv)  $3 \times 3$
- h) How many four-digit numbers can be formed from the digits 1, 2, 3, 4, 5, 6 (Repetition of digits not allowed)? [CO2][L1]  
i) 360 ii) 460 iii) 560 iv) 764
- i) In how many ways number of 2 digits can be formed out of the four digits 1, 2, 3 and 4? [CO2][L3]  
i) 6 ii) 9 iii) 12 iv) 18
- j) An event in the probability that will never be happened is called as - [CO2][L3]  
i) Unsure event ii) Sure event iii) Possible event iv) Impossible event

**2 × 10**

**PART-A**

- Q.2 a) Solve the following system of equations by Cramer's rule:  
 $x + y + z = -1$   
 $x + 2y + 3z = -4$   
 $x + 3y + 4z = -6$  [CO1][L4] **10**
- b) Show that  $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$  find  $x$  and  $y$  so that  $A^2 - xI = yA$  and hence find  $A^{-1}$ . [CO1][L4] **10**
- Q.3 a) Let  $f(x) = x + 1$  and  $g(x) = 2x^2 + 1$  be two real functions. Find fog, fof, gog.gof [CO3][L4] **10**
- b) Let  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{4, 5\}$  and  $C = \{1, 5\}$   
i) Verify that:  $A \times (B - C) = (A \times B) - (A \times C)$   
ii) Find  $(A \times B) \cap (A \times C)$  [CO3][L5] **10**

**P. T. O**

- Q.4 a) In a group of 100 persons, 72 people can speak English and 43 can speak French. How many can speak English only? How many can speak French only and how many can speak both English and French? [CO4][L5] **10**
- b) If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$   
 $A = \{2, 4, 6, 8\}$   
 $B = \{3, 5, 7\}$   
 $C = \{1, 5, 7, 8, 9\}$  Find  
 i)  $(A \cup B)'$   
 ii)  $(B \cap C)'$   
 iii)  $C'$  [CO4][L5] **10**

**PART-B**

- Q.5 a) In how many ways can 4 ladies 6 gentlemen be seated in a line, so that no two ladies may be together [CO2][L4] **10**
- b) Find the coefficient of  $x^4$  in  $\left(x^4 + \frac{1}{x^3}\right)^{15}$  [CO2][L5] **10**
- Q.6 a) Find the value of k if the points A(2, 3), B(4, k) and C(6, -3) are collinear. [CO5][L6] **10**
- b) Find the area of triangle PQR formed by the points P(-5, 7), Q(-4, -5) and R(4, 5). [CO3][L5] **10**
- Q.7 a) If  $P(A) = 7/13$ ,  $P(B) = 9/13$  and  $P(A \cap B) = 4/13$ , evaluate  $P(A|B)$ . [CO2][L6] **10**
- b) Two dice are rolled, find the probability that the sum of the number of both the dice is:  
 i) Equal to 2  
 ii) Equal to 5  
 iii) Less than 12 [CO2][L6] **10**

**End Semester Examination, December 2023**  
MCA – First Semester  
**LINEAR ALGEBRA AND STATISTICAL TECHNIQUES**  
**(MCA-DS-110/MCA-DS-301)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **Part-A** and **TWO** questions from **Part-B**. Marks are indicated against each question.

Q.1 Answer the Following Questions:

- a) Which of the following is not a group under addition? [CO1][L1]  
 i) Integers ii) Rational numbers  
 iii) Real numbers iv) Positive integers
- b) What measure of central tendency is affected by outliers the most? [CO4][L1]  
 i) Mean ii) Median iii) Mode iv) Range
- c) The determinant of the Null matrix is? [CO1][L1]  
 i) 1 ii) 0  
 d) Depends on the matrix iv) None of the mentioned
- d) If for a square matrix A and B, null matrix O,  $AB = O$  implies  $BA=O$ . [CO1][L1]  
 i) True ii) False
- e) Which of the following operations is not allowed for matrices? [CO3][L1]  
 i) Addition ii) Subtraction iii) Multiplication iv) Division
- f) A consistent linear system of two equations in two unknowns has [CO3][L1]  
 i) exactly one solution ii) infinitely many solutions  
 iii) exactly two solutions iv) either A or B
- g) What do you mean by an Upper Triangular Matrix? [CO2][L1]
- h) State Consistent Theorem. [CO4][L1]
- i) Give an example of the Non Homogenous equation. [CO2][L1]
- j) Discuss the Characteristic equation of the matrix. [CO3][L1] **2x10**

**PART-A**

Q.2 a) Prove that  $(\mathbb{Z}, +)$  is an additive abelian group. [CO2][L4] **10**

b) Find the rank of a matrix  $\begin{bmatrix} 5 & 2 & 8 \\ 5 & 9 & 12 \\ 6 & 3 & 13 \end{bmatrix}$ . [CO2][L4] **10**

Q.3 a) Solve the following system of Linear Equations:

$$2x + 3y + 5z = 14$$

$$4x - y + 6z = 12$$

$$15x - 3y + 21z = 3$$

[CO3][L4] **10**

b) Find the value of ' $\lambda$ ' such that the system

$$2x + y + z = 4$$

$$3x + 2y + 2z = 7$$

$$4x + 3y + \lambda z = 10$$
 has

1) No Solution

2) A Unique Solution

[CO3][L4] **10**

Q.4 a) Using the Consistency theorem, show that the equations

$$2x + y - z = 3$$

$$x - 3y + 2z = 4$$

$$3x + 2y - 3z = 1$$

Are consistent and hence obtain the solutions for  $x$ ,  $y$ , and  $z$ .

[CO3][L5] **10**

b) Verify the Cayley- Hamilton theorem for the Matrix

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 0 & 0 & 2 \end{pmatrix}$$

[CO3][L5] **10**

### ***PART-B***

Q.5 a) Calculate the Mean, Median and Mode from the following data:

| Marks           | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 |
|-----------------|------|-------|-------|-------|--------|
| No. of Students | 8    | 15    | 21    | 15    | 20     |

[CO5][L5] **10**

b) Find the correlation coefficient between age and playing habits of the following students:

| Age             | 15  | 16  | 17  | 18  | 19  | 20 |
|-----------------|-----|-----|-----|-----|-----|----|
| No. of students | 250 | 200 | 150 | 120 | 100 | 80 |
| Regular Players | 200 | 150 | 90  | 48  | 30  | 12 |

[CO4][L4] **10**

Q.6 a) Explain the following:

- i) Sampling
- ii) Alternate Hypothesis
- iii) Type I error
- iv) Type II error
- v) Quota Sampling

[CO5][L3] **10**

b) A poker-dealing machine is supposed to deal cards at random, as if from an infinite deck. In a test, you counted 1600 cards and observed the following: Spades 404, Hearts 420, Diamonds 400, and Clubs 376. Could it be that the suits are equally likely? Or are these discrepancies too much to be random?

[CO3] [L3] **10**

Q.7 a) Solve the following linear programming problem graphically:

Minimize  $Z = 4x + 2y$  subject to the constraints:

$$2x + y \leq 8$$

$$x + 2y \leq 6$$

$$x \geq 0, y \geq 0$$

[CO6][L5] **10**

b) Discuss the Simplex method to solve Linear Programming Problems by explaining a suitable example in support.

[CO6][L6] **10**

**End Semester Examination, Dec. 2023**  
MCA – First Semester  
**LINEAR ALGEBRA AND STATISTICAL TECHNIQUES**  
**(MCA-DS-110/MCA-DS-301)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

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[CO3][L4] **10**

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|                 |     |     |     |     |     |    |
|-----------------|-----|-----|-----|-----|-----|----|
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$$x \geq 0, y \geq 0$$

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b) Discuss the Simplex method to solve linear programming problems by explaining a suitable example in support.

[CO6][L3] **10**



**End Semester Examination, Dec. 2023**  
MCA – First Semester  
**DATA STRUCTURES (MCA-DS-111/MCA-DS-302)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

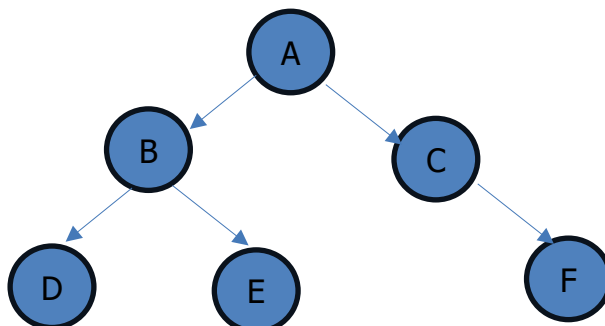
- Q.1 a) The optimal data structure used to solve tower of Hanoi is \_\_\_\_\_ [CO4][L2]  
i) Stack                      ii) Heap                      iii) Priority queue      iv) Tree
- b) The prefix form of the expression  $(A + B) * C$  is? [CO2][L2]  
i)  $* + ABC$                   ii)  $+ * ABC$                   iii)  $* ABC+$                   iv) none of the above
- c) Which one of the following is the process of inserting an element in the stack? [CO2][L2]  
i) Push                      ii) Add                      iii) Insert                      iv) None of the above
- d) When the user tries to delete the element from the empty stack then the condition is said to be [CO4][L1]  
i) Underflow                      ii) Overflow
- e) What is time complexity? [CO1][L1]
- f) What is linked list? [CO3][L1]
- g) What is traversing? [CO3][L1]
- h) Queue is based on which principle? [CO4][L1]
- i) What is graph? [CO2][L1]
- j) What is file organization? [CO5][L1] **2×10**

**PART-A**

- Q.2 Define 'array'. What is row-major and column-major order methods? Give example. How do we evaluate the performance of algorithms? [CO1][L2] **20**
- Q.3 Design an algorithm for the transforming the infix notation into postfix notation. Consider the following infix expression P:  
P:  $A + (B * C - (D / E ^ F) * G) * H$   
Transform the infix expression into Postfix expression. Show each step. [CO4][L3] **20**
- Q.4 Compare array and linked list. Write an algorithm to insert a new node in the linked list. Describe the concept of circular linked list along with advantages and disadvantages. [CO3][L3] **20**

**PART-B**

- Q.5 What are binary search trees? Design the algorithm to search and insert an element in binary search tree. Give example. Consider the following Binary Tree T and show the traversals using all methods:



[CO4][L3] **20**

**P. T. O**

Q.6 Describe the following with example:

- a) Types of graph.
- b) Linked representation of graphs.
- c) Kruskal algorithm.

[CO2][L2] **20**

Q.7 Define 'hashing'. Differentiate fixed and variable length record. Explain the various hashing techniques along with suitable example.

[CO5][L1] **20**

**End Semester Examination, Dec. 2023**  
MCA – First Semester  
**OBJECT ORIENTED PROGRAMMING IN JAVA**  
**(MCA-DS-112/ MCA-DS-303)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

**Q.1 Multiple choice questions:**

- a) What is Java Virtual Machine (JVM)? [CO-1][L-1]
- i) A tool for compiling Java code
  - ii) A virtual computer used for gaming
  - iii) A runtime environment for executing Java applications
  - iv) A type of coffee machine
- b) What is the main difference between a class and an object in Java? [CO-2][L-2]
- i) A class is a blueprint for objects, and an object is an instance of a class.
  - ii) A class and an object are the same thing.
  - iii) A class is used for inheritance, and an object is used for encapsulation.
  - iv) A class is a collection of methods, and an object is a collection of data.
- c) Which keyword is used to create an instance of a class in Java? [CO-2] [L-2]
- i) create
  - ii) new
  - iii) instance
  - iv) class
- d) In Java, what is the purpose of the "super" keyword? [CO-3][L-2]
- i) To call the superclass constructor or method
  - ii) To access a static variable
  - iii) To create a new object
  - iv) To mark a variable as constant
- e) What is the process of bundling data and methods that operate on that data into a single unit called in Java? [CO-3] [L-2]
- i) Encapsulation
  - ii) Inheritance
  - iii) Polymorphism
  - iv) Abstraction
- f) Which of the following is not a valid access modifier in Java? [CO-3] [L-2]
- i) Public
  - ii) Private
  - iii) Protected
  - iv) Internal
- g) What is the Java keyword used to implement multiple inheritance? [CO-4][L-2]
- i) Inherit
  - ii) Super
  - iii) Extends
  - iv) Implements
- h) What is the default value of an instance variable (non-primitive data type) in Java if it is not initialized explicitly?[CO-4][L-2]
- i) 0
  - ii) null

**P. T. O.**

- iii) -1
- iv) False
- i) In Java, what is the purpose of the "this" keyword?[CO-3][L-2]
  - i) To create a new object
  - ii) To access a superclass method
  - iii) To reference the current instance of the class
  - iv) To declare a constant variable
- j) What is the primary purpose of the "try," "catch," and "finally" blocks in Java? [CO-4][L-2]
  - i) To define a loop
  - ii) To perform arithmetic calculations
  - iii) To handle exceptions and perform cleanup operations
  - iv) To declare variables

**2×10**

### **PART-A**

- Q.2 a) Enumerate the buzzwords associated with Java. [CO-2][L-2] **10**  
 b) Elaborate on the fundamental structure of a Java program, by highlighting the key components and their sequential arrangement. [CO-2][L-2] **10**
- Q.3 a) Explain the concepts of constructors. How are constructors used to initialize objects, and how do instance variables store object-specific data? Provide an example of a Java class that uses constructors and instance variables. [CO-4][L-3] **10**  
 b) Discuss the concept of "method overriding" in Java and how it differs from method overloading. [CO-4][L-3] **10**
- Q.4 a) Explain the difference between an abstract class and an interface in Java. Provide examples and discuss when it is appropriate to use each of them in your code. [CO-3][L-2] **10**  
 b) Explain the access modifiers used in Java and how they affect the visibility of classes and members within the same package and outside the package. [CO-3][L-2] **10**

### **PART-B**

- Q.5 Explain the concept of threads in Java. What are the advantages of using multi threading, and how does it differ from single-threaded programs? Illustrate an example of creating and running a simple thread in Java. [CO-5] [L-2] **20**
- Q.6 a) What is a Java applet, and how does it differ from a standalone Java application? Explain the lifecycle of a Java applet. [CO-5][L-2] **10**  
 b) How can you create a smiley face using Java's AWT (Abstract Window Toolkit) and frames? Provide an example of Java code to draw a smiley face on a frame, including the face, eyes, and a smiling mouth. [CO-5][L-3] **10**
- Q.7 Explain the purpose and key components of AWT (Abstract Window Toolkit) in Java. How does AWT enable the creation of graphical user interfaces (GUIs), and what are some common AWT components for building GUIs? Provide an example of using AWT to create a simple GUI application. [CO-6][L-3] **20**

# End Semester Examination, Dec. 2023

MCA – First Semester

## PYTHON PROGRAMMING (MCA-DS-113)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Define 'implicit conversion'. [CO-1][L-2]
- b) What is the difference between compiled and interpreted languages? [CO-1][L-1]
- c) How do you define a function in Python? [CO-3][L-1]
- d) What is the purpose of the if statement in Python? [CO-2][L-1]
- e) How do you remove an item from a Python list? [CO-4][L-2]
- f) What is the purpose of the in keyword in Python? [CO-2][L-1]
- g) How do you check the data type of a variable in Python? [CO-4][L-2]
- h) How do you open a file for writing in Python? [CO-5][L-2]
- i) What is the difference between a tuple and a list in Python? [CO-4][L-2]
- j) How do you check if a string contains a specific substring in Python? [CO-4][L-2] **2×10**

### **PART-A**

- Q.2 a) Python variables do not have specific types. Justify this statement with the help of an example. [CO-1][L-3] **6**  
b) Explain the rules for writing identifiers. Write any four keywords in Python. [CO-1][L-2] **7**  
c) What is Python, and why is it popular in the programming community? [CO-1][L-2] **7**
- Q.3 a) Write a Python program that uses a for loop to iterate through a list of numbers. If a negative number is encountered, skip it using continue, and if zero is encountered, stop the loop using break. [CO-2][L-3] **10**  
b) Explain the difference between the if, elif, and else statements in Python. Provide an example where all three are used to demonstrate their purpose. [CO-2][L-2] **10**
- Q.4 a) Describe at least five inbuilt methods for string manipulation in Python. Provide examples for each method, showcasing their functionality. [CO-3] [L-3] **10**  
b) Write a Python program calculate the product, multiplying all the numbers of a given tuple. Original Tuple: (4, 3, 2, 2, -1, 18) Product - multiplying all the numbers of the said tuple: -864  
Original Tuple: (2, 4, 8, 8, 3, 2, 9) Product - multiplying all the numbers of the said tuple: 27648 [CO-3] [L-3] **10**

### **PART-B**

- Q.5 What is a Python module, and how does it contribute to code organization in larger projects? Provide examples of built-in and user-defined modules. [CO-4] [L-3] **20**
- Q.6 Describe the basic structure of a try-except block in Python. How does exception handling improve code reliability? Also discuss the role of the finally clause in exception handling. Provide scenarios where it is beneficial. [CO-4] [L-3] **20**
- Q.7 Compare and contrast the behavior of terminal-based programs and GUI-based programs. What are the key differences in user interaction and interface design principles? [CO-5] [L-3] **20**

**End Semester Examination, Dec. 2023**  
MCA – Third Semester  
**ADVANCE DATABASE SYSTEMS (MCA-DS-502)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1
- a) Which one of the following refers to the "data about data"? [CO-1][L-2]
    - i) Meta data      ii) Directory      iii) Sub Data
  - b) In general, a file is basically a collection of all related\_\_\_\_\_. [CO-1][L-1]
    - i) Field      ii) rows and columns      iii) Database
  - c) Rows of a relation are known as the \_\_\_\_\_. [CO-1][L-1]
    - i) Degree      ii) Tuples      iii) Entity      iv) All of the above
  - d) Which one of the following command is used to delete the existing row in a table? [CO-3][L-2]
    - i) Delete      ii) Update      c) Insert
  - e) Which one of the following commands is used to restore the database to the last committed state? [CO-4][L-2]
    - i) Savepoint      ii) Rollback      iii) Commit
  - f) Define SQL [CO-4][L-1]
  - g) Define PL-SQL [CO-4][L-1]
  - h) Define E-R Diagram [CO-5][L-1]
  - i) Define RDBMS [CO-1][L-1]
  - j) Define Database [CO-1][L-1] **2×10**

**PART-A**

- Q.2 Explain what is meant by normalization and its advantages. Explain and define 1NF, 2NF, 3NF and BCNF by giving suitable examples for each. [CO-1] [L-2] **20**
- Q.3
- a) What is query processing? Describe the steps involved in query processing. Discuss the issues that are considered in designing of query optimizer. [CO-2] [L-1] **10**
  - b) Compare and contrast data warehouse and data mining. [CO-1] [L-5] **10**
- Q.4 Discuss various Repetitive Statements available in PL-SQL along with syntax, purpose and example. Also, explain the concept of Cursors in PL-SQL. [CO-3] [L-6] **20**

**PART-B**

- Q.5 Compare the following:
- a) Centralized versus non centralized Databases
  - b) Homogeneous and Heterogeneous DDBMS [CO-4] [L-5] **20**
- Q.6 Assuming that you are the data security administrator of a public sector bank, what are the different securities and privacy measures that you will propose for its customer's data? Explain in detail with example. [CO-4] [L-2,3] **20**
- Q.7 Write short note on the following:
- a) Deadlock Handling
  - b) Recovery and Atomicity [CO-4] [L-1] **10**

# End Semester Examination, Dec. 2023

MCA – Third Semester

## PROGRAMMING IN .NET (MCA-DS-503)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) Define namespace in .NET programming. [CO-1][L-1]
- b) Differentiate between 'client side' and 'server side' programming. [CO-1][L-1]
- c) What is index overloading? [CO-1][L-1]
- d) Differentiate between 'Msg Box' and 'Dialog Box'. [CO-2][L-1]
- e) Explain 'session tracking'. [CO-3][L-2]
- f) Differentiate between text box and combo box. [CO-5][L-2]
- g) What is the use of Data Reader? [CO-5][L-1]
- h) Differentiate between Data Set and Data Table. [CO-5][L-1]
- i) Write full forms of XML and ADO. [CO-6][L-1]
- j) Differentiate between command and connection class. [CO-6][L-1] **2×10**

### **PART-A**

- Q.2 a) "Microsoft has united various modern as well as existing technologies of software development in .NET Framework to develop highly efficient applications for modern as well as future business needs". Explain the main components of .NET framework? [CO-2][L-2] **10**
- b) Explain the execution process of .NET program. [CO-2][L-2] **10**
- Q.3 a) Explain 2-dimensional array. Write a code to add two matrices. [CO-2][L-1] **10**
- b) What is an Exception? Explain five types of exceptions and their handling. [CO-1][L-2] **10**
- Q.4 a) Illustrate the concept of inheritance in C#. How a programmer can provide a specific implementation of the method which is already provided by its base class? Illustrate with the help of a suitable program. [CO-3] [L-2] **10**
- b) Differentiate between operator overloading and method overloading. [CO-2][L-2] **10**

### **PART-B**

- Q.5 a) Let us assume that you have asked to automate the process of Admission letter generation for a certain University The current process is completely manual and requires editing existing Admission letters, which is prone to error. There are certain things that would be common for all Admission letters, such as University location, University timings, University title, University branding, etc. Other things such as Student name, Course, Fees, joining date, etc., are specific to each admission letter.
- Provide a better solution to resolve this problem. [CO-3] [L-3] **10**
- b) What do you mean by windows form? Explain different controls used to create a windows form. [CO-5][L-2] **10**
- Q.6 a) "The Microsoft ASP.NET framework includes several options to create web services and applications". Analyse the various features of ASP.Net that are used to createdynamic web pages. [CO-3][L-2] **10**
- b) Explain the architecture of ADO.NET and its components in detail. [CO-4] [L-3] **10**
- Q.7 a) Create a simple Login Windows form application in C#. It will show a simple Login screen, which will be accessible by the user. The user will enter the required

credentials and then will click on the Login button to proceed. Only three attempts are allowed at a time. Write a code to show the required functionality in C#.

[CO-3] [L-3] **10**

b) Explain different ASP.NET components of a web form.

[CO-5][L-2] **10**



**End Semester Examination, Dec. 2023**  
MCA – Third Semester  
**SOFTWARE ENGINEERING AND TESTING (MCA-DS-504)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 Explain the following in brief:
- Software engineering.
  - W model.
  - LOC and token count.
  - Prototype Model.
  - Cohesion.
  - Design objectives.
  - Error, defect and mistake.
  - Dynamic testing.
  - Software quality assurance.
  - Mutation testing.

**2×10**

**PART-A**

- Q.2 a) Distinguish between generic and customized software products. [CO1,2][L1,2,3] **5**  
b) Discuss the phases of spiral model with its advantages and disadvantages. [CO1,2][L1,2,3] **15**

- Q.3 Consider a project with the following parameters:  
No. of user inputs=32, No. of user outputs=38, No. of user enquires=26, No. of user files=7, No. of external interfaces=3. Assume all the weighting factors are at high rate. In addition to above system requires:  
i) Average distributed processing functions.  
ii) Design code is significant.  
Other complexity adjustment factors are treated as essential. Compute UFP and function point. [CO3][L1,3] **20**

- Q.4 a) What is modularity? [CO4] [L3,4] **5**  
b) Differentiate between logical design and physical design. Explain all types of coupling and what types of problems arise if two modules have high coupling. [CO4] [L3,4] **15**

**PART-B**

- Q.5 Distinguish between testing and debugging. A program reads three numbers a, b, c within the range (1, 50) and prints the largest number. Design the test cases for this program using boundary value analysis, and robust testing. [CO5][L1,2,3] **20**
- Q.6 Discuss the following:  
a) Load test and stress test.  
b) Alpha test and beta test.  
c) Security testing.  
d) Regression testing. [CO5][L3,4] **20**
- Q.7 What is Maintenance? How an effective testing helps in reduction of software cost and maintenance cost? Explain the various maturity levels in CMM structure. [CO6] [L3] **20**

# End Semester Examination, Dec. 2023

MCA – Third Semester

## CLOUD COMPUTING (MCA-DS-506)

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

- Q.1 a) What exactly is cloud computing? [CO-1] [L-1]  
i) A way to organize desktop computers  
ii) Lightweight software that takes up little space on a hard drive  
iii) Computing resources that can be accessed on demand, like electricity from a utility  
iv) The World Wide Web
- b) Which of these is not a major type of cloud computing usage? [CO-1] [L-1]  
i) Hardware as a Service                      ii) Platform as a Service  
iii) Software as a Service                      iv) Infrastructure as a Service
- c) Which of the following is not a type of cloud? [CO-1] [L-1]  
i) Private                      ii) Public                      iii) Protected                      iv) Hybrid
- d) Which cloud computing feature allows for server consolidation resulting in increased asset utilization and decreased data center energy needs? [CO-1] [L-1]  
i) Virtualization    ii) Provisioning    iii) Automation    iv) Governance
- e) What is a common trait of cloud architectures? [CO-1] [L-1]  
i) It dictates monolithic application designs.  
ii) It must use publicly accessible computing resources.  
iii) A fixed set of computing resources is pre-allocated to each application.  
iv) While in operation the application automatically scales up or down based on resources need.
- f) The properties necessary to guarantee a reliable transaction in databases and other applications is referred to as \_\_\_\_\_. [CO-1] [L-1]  
i) BASE                      ii) ACID                      iii) ATOM                      iv) All of the mentioned
- g) Which of the following component is required for both online and local data access in hybrid application? [CO-1] [L-1]  
i) Local                      ii) Cloud  
iii) Both local and cloud                      iv) None of the mentioned
- h) Which of the following service provider provides the least amount of built in security? [CO-1] [L-1]  
i) SaaS                      ii) PaaS                      iii) IaaS                      iv) All of the mentioned
- i) Which of the following area of cloud computing is uniquely troublesome? [CO-1] [L-1]  
i) Auditing                      ii) Data-integrity  
iii) e-Discovery for legal compliance                      iv) All of the mentioned
- j) EC2 compute unit is the equivalent of a \_\_\_\_\_ GHz 2007 Opteron or 2007 Xeon processor?  
i) 1                      ii) 2  
iii) 4                      iv) None of the mentioned                      **2×10**

**P. T. O**

### **PART-A**

- Q.2 a) Illustrate the essential characteristics of Cloud Computing. [CO-1][L-4] **10**  
b) Explain the benefits of the Cloud computing virtualization. [CO-2][L-2] **10**
- Q.3 a) Why elasticity and load-balancing is required in Cloud Computing? [CO-3][L-4] **10**  
b) Demonstrate the usefulness of XaaS. [CO-3][L-3] **10**
- Q.4 Differentiate between PaaS and SaaS. Explain various characteristics of PaaS and SaaS with suitable example? [CO-4][L-4] **20**

### **PART-B**

- Q.5 What are the key components of data security in cloud computing? What is CryptDB? How does it provide the data security in cloud computing? [CO-5][L-1] **20**
- Q.6 What is the AWS? Explain the use and working of EC2 and S3 bucket. [CO-5][L-2] **20**
- Q.7 Explain any three Consumer Applications for the Cloud Computing. [CO-5][L-2] **20**

**End Semester Examination, Dec. 2023**  
MCA – Third Semester  
**NETWORK SECURITY AND CRYPTOGRAPHY**  
**(MCA-DS-507/ MCA-DS-507A)**

Time: 3 hrs.

Max Marks: **100**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following in brief:

- a) CIA Triad lies at the heart of Computer Security. Discuss the two concepts associated with 'C' in CIA Triad. [L-1][CO-1]
- b) Aadhar Card has virtual ID number. Identify the authentication. What is its use? [L-1][CO-1]
- c) Some malicious programs appear to have a useful function but also have a potentially harmful function. Identify them and describe their feature. [L-1][CO-1]
- d) During a particular type of attack, invalid signals are sent by attackers in the handshake session between servers and clients. Identify the attack and the kind of injection. What are their characteristics? [L-1][CO-2]
- e) A person is wearing contact lenses and has to authenticate his identity through his eyes. Identify the kind of authentication. What kind of issue he will face to authenticate his identity? [L-1][CO-2]
- f) 'X' is a system that monitors network traffic for suspicious activity and alerts when such activity is discovered. Identify X and list its characteristics. [L-1][CO-1]
- g) Give four differences between stream cipher and block cipher. [L-2][CO-5]
- h) Illustrate with diagram the concept of Network Segmentation. [L-3][CO-3]
- i) Differentiate between Symmetric and Asymmetric Encryption. [L-3][CO-2]
- j) 'A' is a mathematical technique used to validate the authenticity and integrity of a message, software, or digital document. Identify A and briefly list its objectives. [L-1][CO-6] **2×10**

**PART-A**

- Q.2 a) Attacks can be categorized depending upon the situation where there is modification of data or not. How is one attack different from another? Compare the differences between Traffic Analysis and Masquerade. [CO-2][L-3] **10**
- b) Consider an automated teller machine (ATM) in which users provide a personal identification number (PIN) and a card for account access. Outline the effect on the three objectives of computer security. [CO-2][L-3] **10**
- Q.3 a) One of the results of the growing awareness of the intruder problem has been the establishment of a number of Computer Emergency Response Teams (CERT). These co-operative ventures collect information about system vulnerabilities and disseminate it to systems managers. Categorize the various Intruders in a network. How do they affect a network? [CO-3][L-2] **10**
- b) 'X' is a network security device, either hardware or software-based, which monitors all incoming and outgoing traffic and based on a defined set of security rules it accepts, rejects or drops that specific traffic. Outline need and describe the functioning of 'X' in network security. [CO-3][L-2] **10**

- Q.4 a) Physical Security is critical, especially for small business that does not have many resources to devote to security personnel and tools as opposed to larger firms. Describe the layers in physical security. [CO-4][L-5] **10**  
b) What are buffer overflow attacks? What are the types of buffer overflow attacks? [CO-4][L-5] **10**

**PART-B**

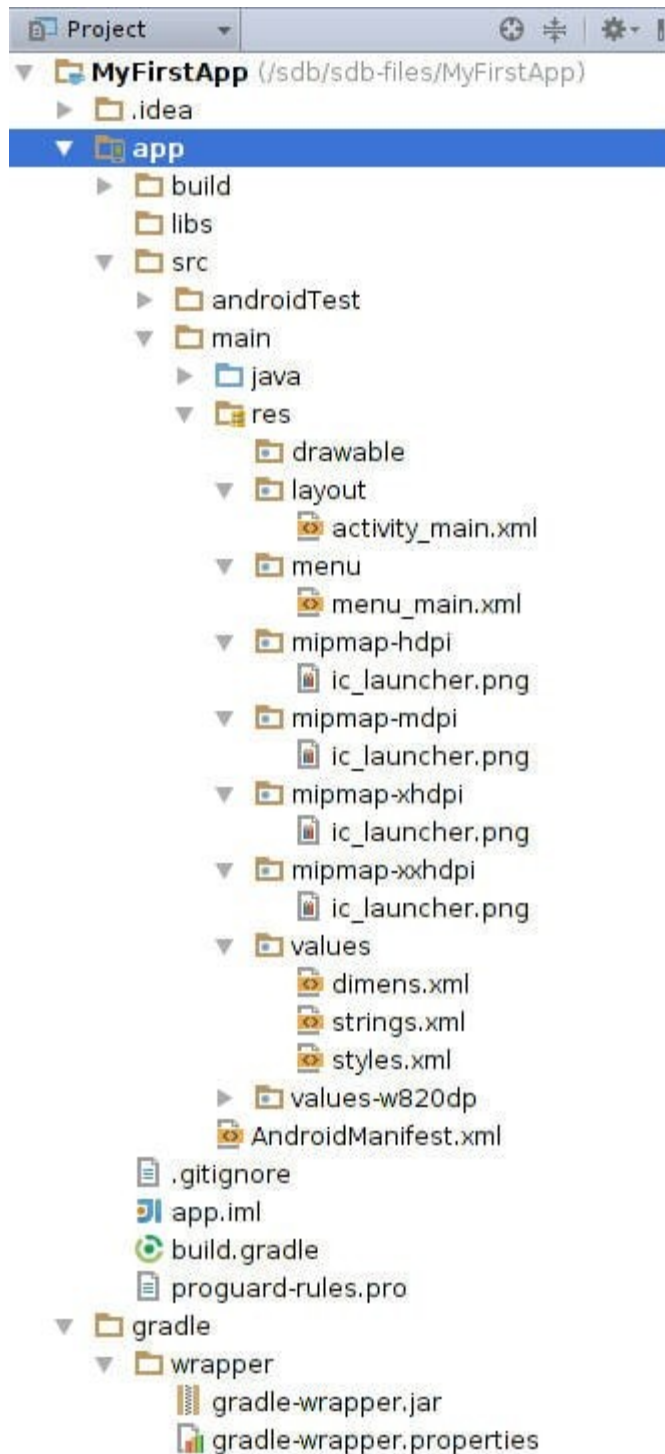
- Q.5 a) Use the Caesar cipher with shift of 3 to encrypt the message: "We ride at noon". [CO-5][L-5] **10**  
b) Decrypt the message CEE IAI MNL NOG LTR VMH NW using the method above with a table with rows of 5 characters. [CO-5][L-5] **10**
- Q.6 a) Differentiate between AES and DES. [CO-5][L-4] **5×2**  
b) Write short notes on:  
i) Known plaintext.  
ii) Chosen plaintext.  
iii) Chosen ciphertext. [CO-5][L-4] **10**
- Q.7 a) Explain risk analysis. Describe the types of risk assessment. Illustrate with diagram the different defense models in response to risk assessment. [CO-6][L-5] **10**  
b) Explain the application of Chinese remainder theorem in cryptography. [CO-6][L-5] **10**



## **PART-A**

Q.2 Explain the diagram given below:

[L1] [CO3] **20**



Q.3 Activities are referred to as a window to the user interface. It helps in the display of output or could even ask for inputs so that the dialog boxes and other roles can be performed to create a user interface. Explain the lifecycle of an activity with the help of a diagram. [CO2][L3] **20**

Q.4 Although apps may have avoided multitasking because of the limited hardware resources of the early mobile devices, their specificity is now part of their desirability

because they allow consumers to hand pick what their devices are able to do. Which different varieties of apps are available in android? [CO2][L2] **20**

### **PART-B**

- Q.5 A framework provides the bones of an application, to be fleshed out with graphics, animation, special features and functionality. Name and explain some top Android app development framework. [CO5][L2] **20**
- Q.6 Content providers are one of the primary building blocks of Android applications, providing content to applications. Explain the working, the basic operations performed and the examples of content providers. [CO4][L2] **20**
- Q.7 As the technology is emerging, it has become quite essential for an android developer to learn about location-based services. What do you know about these services? Pen down the following for LBS:
- a) Components of LBS.
  - b) Methods to get location.
  - c) Methods to get location QoS.
- [CO4][L3] **20**