



ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject : Python Programming

Course: BCA /B.Sc(IT)

Full Marks : 70

Pass Marks: 28

Time : 3 Hours

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions :(10x1=10)

a) Which of these is not a core data type?

- (i) List
- (ii) Dictionary
- (iii) Type
- (iv) Class

b) Python is _____ language

- (i) Compiled
- (ii) Procedure
- (iii) Interpreted
- (iv) Non-Interactive

(c) To add a new element to a list we use which command?

- (i) list1.add(5)
- (ii) list1.append(5)
- (iii) list1.addLast(5)
- (iv) list1.addEnd(5)

(d) What will be the output of the following code :
print type(type(int))

- (i) type 'int'
- (ii) type 'type'
- (iii) Error
- (iv) 0

(e) What is the output of the following code :

```
L = ['a','b','c','d']  
print "".join(L)
```

- (i) Error
- (ii) None
- (iii) abcd
- (iv) ['a','b','c','d']

(f) What is called when a function is defined inside a class?

- (i) Module
- (ii) Class
- (iii) Another Function
- (iv) Method

(g) Python was released publicly in

- (i) 1941
- (ii) 1961
- (iii) 1991
- (iv) 1981

(h) Which of the following function convert a string to a float in python?

- (i) int(x [,base])
- (ii) long(x [,base])
- (iii) float(x)
- (iv) str(x)

(i) What is the output of the following?

```
i = 2
while True:
    if i%3 == 0:
        break
print(i)
i += 2
```

- (i) 2 4 6 8 10
- (ii) 2 4
- (iii) 2 3
- (iv) Error

(j) Which function displays a message on the screen in Python?

- (i) sys.out.println()
- (ii) print()
- (iii) writeln()
- (iv) console.writeln()

B] Very Short question(5x2=10)

- a) Explain ** operator
- b) Explain interpreter
- c) Write any two methods of Dictionary datatype
- d) What is comment in python programming
- e) List any four key features of Python.



PART B

Q2. Answer any four:

(4x5=20)

- i) What are the arithmetic operators in python? Provide example to support your answer.
- ii) Explain tuple with example.
- iii) What is the role on indentation in python ? Provide example to support your answer.
- iv) Write a python program to input length,breadth and radius and calculate area of rectangle and circle and print the result.
- v) Write a python program to swap two numbers without using temporary variable
- vi) Explain if-elif condition in python with suitable example

PART C

Answer any three:

(3x10=30)

Q.3)How to create a Dictionary in python? Give suitable example to justify your answer

Q.4) Write a program to display the following pattern

```

1 2 3 4 5
 1 2 3 4
   1 2 3
    1 2
     1

```

Q.5)Write a program in python to create a function using lambda to add two numbers.

Q.6)Write a Python code to check whether the given number is a strong number. Strong Numbers are numbers whose sum of factorial of digits is equal to the original number (Example: 145 = 1! +4! + 5!) .

Q.7)List and explain any five exceptions in Python.

Q.8)Write a python program to input a number and check whether it is prime number or not.

Q.9) Explain MVC design with the help of tkinter program

- iv) appletwatcher
- e) Platform independent code file created from source file is understandable by _____
 - i) Compiler
 - ii) Applet
 - iii) JRE
 - iv) JVM
- d) Which of these assignments is invalid?
 - i) short s = 48;
 - ii) float f = 4.3;
 - iii) double d = 4.3;
 - iv) int i = '1';

(f) What is called when a function is defined inside a class?

- (i) Module
- (ii) Class
- (iii) Another Function
- (iv) Method

(g) Python was released publicly in

- (i) 1941
- (ii) 1961
- (iii) 1991
- (iv) 1981

(h) Which of the following function convert a string to a float in python?

- (i) `int(x [,base])`
- (ii) `long(x [,base])`
- (iii) `float(x)`
- (iv) `str(x)`

(i) What is the output of the following?

```
i = 2
while True:
    if i%3 == 0:
        break
print(i)
i += 2
```

- (i) 2 4 6 8 10
- (ii) 2 4
- (iii) 2 3
- (iv) Error

(j) Which function displays a message on the screen in Python?

- (i) `sys.out.println()`
- (ii) `print()`
- (iii) `writeln()`
- (iv) `console.writeln()`

B] Very Short question(5x2=10)

- a) Explain `**` operator
- b) Explain interpreter
- c) Write any two methods of Dictionary datatype
- d) What is comment in python programming
- e) List any four key features of Python.



ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject : Programming with Java

Course: BCA /B.Sc(IT)

Full Marks : 70

Pass Marks: 28

Time : 3 Hours

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions :

(10x1=10)

- a) Which one of the following will declare an array and initialize it with five numbers?
- Array a = new Array(5);
 - int [] a = {23, 22, 21, 20, 19};
 - int a [] = new int[5];
 - int [5] array;
- b) Which is a valid keyword in Java?
- interface
 - string
 - float
 - unsigned
- c) Which class cannot be a subclass in Java?
- abstract class
 - parent class
 - final class
 - none of the above
- d) Which of the following is used to interpret and execute Java Applet Classes hosted by HTML?
- appletshow
 - appletscreen
 - appletviewer
 - appletwatcher
- e) Platform independent code file created from Source file is understandable by _____.
- Compiler
 - Applet
 - JRE
 - JVM
- f) Which of these assignments is invalid?
- short s = 48;
 - float f = 4.3;
 - double d = 4.3;
 - int I = '1';

- g) Which keyword is used for accessing the features of a package?
- export
 - import
 - package
 - extends
- h) Identify the modifier of a method that makes the method available to all classes in the same package and to all the subclasses of this class.
- private
 - default
 - protected
 - public

i) Identify the correct sequence for the following?

- class x{}
- package y;
- import a.b;

- 1, 2, 3
- 2, 3, 1
- 3, 2, 1
- 3, 1, 2

j) Which command from the JDK should be used to execute the main() method of a class named SmallProg?

- java SmallProg
- javac SmallProg
- java SmallProg.java
- java SmallProg.class

B] Very Short question

- State the difference between class and interface in Java.
- What is the Java Virtual Machine?
- Differentiate java virtual machine and java run time environment.
- What is the difference between the Boolean & operator and the && operator?
- What is difference between while and do...while loop?

(5x2=10)

PART B

Q2. Answer any four:

- Briefly discuss exception handling in Java.
- What is Polymorphism? What are the two types of Polymorphism in Java and also give example for each?
- Explain public, private and protected access specifiers in Java.
- Create an Applet to display the String "My First Applet" painted on the applet.
- What is the difference between an Interface and an Abstract class?
- What are the two types of Exceptions in Java? Which are the differences between them?

(4x5=20)



PART C

Course: BCA
Full Marks: 70
Pass Marks: 28

Answer any three:

(3x10=30)

Q.3) Explain in brief the different stages or methods of an Applet life cycle.

Q.4) Write a program to display the following pattern

```
1
121
12321
1234321
123454321
```

Q.5) Write a program to input a number and print its factorial using recursion. (10x)=10

Q.6) Write a function to print the sum of the following series

$1+2^2+3^3+\dots+n^n$, where n is passed as an argument to the function.

Q.7) Write a Java program to count the letters, spaces, numbers and other characters of an input string.

Q.8) Design an AWT application that contains the interface to add student information and display the same.



ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject: DE

Time: 3 Hours

Course: BCA
Full Marks: 70
Pass Marks: 28

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- Question Paper is divided into Three Parts –A, B & C
- Part-A is compulsory.
- Part- B contains SIX questions out of which FOUR questions are to be answered.
- Part- C contains SIX questions out of which THREE questions are to be answered.

PART A

Q1.) All questions are compulsory:-

(10x1=10)

A) Objective Answer Type

i) The output of a NOT gate is HIGH when _____.

- a) the input is LOW
- b) the input is HIGH
- c) power is applied to the gate's IC
- d) power is removed from the gate's IC

ii) Which of the following gates is described by the expression $X = ABCD$?

- a) OR
- b) AND
- c) NOR
- d) NAND

iii) A half subtractor circuit has

- a) 2 i/p & 2 o/p
- b) 3 i/p & 2 o/p
- c) 2 i/p & 3 o/p
- d) none of these

iv) Which one of the following is odd?

- a) Multiplexer
- b) Decoder
- c) Adder
- d) Flip-Flop

v) Solve this BCD problem: $0100 + 0110 =$

- a) 00010000_{BCD}
- b) 00010111_{BCD}
- c) 00001011_{BCD}
- d) 00010011_{BCD}

vi) What is the major difference between half-adders and full-adders?

- a) Nothing basically; full-adders are made up of two half-adders.
- b) Full adders can handle double-digit numbers.
- c) Full adders have a carry input capability.
- d) Half adders can handle only single-digit numbers.

vii) How many data select lines are required for selecting eight inputs?

- a) 1
- b) 2
- c) 3
- d) 4

viii) Which of the following combinations cannot be combined into K-map groups?

- a) Corners in the same row
- b) Corners in the same column
- c) Diagonal corners
- d) Overlapping combinations

- ix) The minimum number of flip-flops needed to construct a BCD decade counter is
 a) 4 b) 3 c) 10 d) 2
- x) Convert the fractional binary number 0000.1010 to decimal.
 a) 0.625 b) 0.50 c) 0.55 d) 0.10

B) Short Answer Type

(5x2=10)

- i) Differentiate Analog and Digital system.
- ii) Do the function (-17-9) by using 2's compliment.
- iii) Design a logic circuit for expression $AB + C$.
- iv) What do you mean by sequential circuits?
- v) Define encoder.

PART B

Q2.) Answer any four:

(4x5=20)

- i) Implement the SUM and CARRY Boolean functions of half adder with multiplexers.
- ii) Differentiate
 - a) Combinational and Sequential circuits.
 - b) Synchronous & Asynchronous counters.
- iii) Draw the circuit diagram for a full adder by using two half adder.
- iv) Draw the neat & clean circuit diagram for an universal shift register.
- v) What is the Multiplexer? Design a 16:1 MUX by using 4:1 MUX with proper diagram.
- vi) What is half adder? Design a half adder with its truth table.

PART C

Answer any Three:

(3x10=30)

Q3.) Draw a truth table for following flip-flops with their circuit diagram & discription
 a) J-K b) D c) RS d) T

Q4.) What do you mean by shift register? Explain all the types of shift register.

Q5.) Design a Mod-10 counter with proper truth table & circuit diagram.

Q6.) Obtain the simplified expression in sum of products for the following Boolean functions:

- | | |
|--------------------------|-------------------------------|
| a) $xy + x'y'z' + x'yz'$ | b) $A'B + BC' + B'C'$ |
| c) $a'b' + bc + a'bc'$ | d) $xy'z + xyz' + x'yz + xyz$ |

Q7.) Minimize the Boolean function & realize it in circuit diagram by using universal gates:
 $F(A,B,C) = \Sigma 0,1,3,5 + \Sigma 2,7$

Q8.) Design a full subtractor by using circuit diagram & their truth table.



2-c-x

Subject : DBMS ✓

Time : 3 Hours

Course: BCA/BSCIT

Full Marks : 70

Pass Marks: 28

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PART A

Q.1) All questions are compulsory

A) Multiple Choice Questions :

(10x1=10)

- An Association between students and courses is?
 - 1:1 relationship
 - 1:M relationship
 - M:M relationship
 - None of these
- DBMS is used to?
 - Eliminate data redundancy
 - Maintain data integrity
 - Establish relationships among different files
 - All of these
- In E-R Model OVAL represents?
 - Entity set
 - Relationship
 - Attributes
 - Links
- Which of the following are the properties of entities?
 - Keys
 - Variables
 - Relationships
 - Attributes
- Which command is used to remove all rows from a table?
 - Delete
 - Drop
 - All of these
 - None of these
- A command that lets you change one or more fields in a record is?
 - Insert.
 - Modify.
 - Truncate.
 - None.
- The attributes made up of more than one single attributes are called
 - Derived Attribute
 - Composite Attribute
 - Single Attribute
 - Multi valued Attribute
- Which of the following keys uniquely identifies the entity set?
 - Primary key
 - Super key

- iii) Candidate key
- iv) None of these
- i) The data model which describes what data is stored is called?
 - i) Internal Model
 - ii) External Model
 - iii) Logical Model
 - iv) All of these
- j) In E-R Model details of the entities are hidden from the user. This process is called ?
 - i) Generalization
 - ii) Specialization.
 - iii) Abstraction.
 - iv) None

B] Very Short question

(5x2=10)

- a) What is Entity and Relationship?
- b) What is Entity set?
- c) What is key in Relational Data base?
- d) What is Normalization?
- e) What is Partial participation in E-R Model?

PART B

Q2. Answer any four:

(4x5=20)

- i) With example explain weak entities.
- ii) Explain any 4 types of attributes in ER model with an example.
- iii) What are the Primary, Composite keys?
- iv) Explain about SELECT and PROJECT Operators in Relational Algebra.
- v) What is Specialization? Explain it with E-R diagram?
- vi) Write notes on DBA (Data Base Administrator)

PART C

Answer any three:

(3x10=30)

- Q.3) What is Relational Algebra. Compare it with Relational Calculus. Describe Tuple relational calculus
- Q.4) Describe E.F CODD's 12 rules for RDBMS.
- Q.5) What is 2NF. Explain with Example.
- Q.6) What is Transaction in Database Management System. Give example. Also explain ACID property of Transaction.
- Q.7) Write down syntax showing FOR Loop in PL/SQL. Write a PL/SQL program to display numbers from 1 to 10.
- Q.8) Explain 1NF with proper example.



ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

1-c-x

Subject: Data Communication & Networking

Course: BCA

Full Marks: 70

Pass Marks: 28

Time: 3 Hours

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- Question Paper is divided into **Three Parts –A, B & C**
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PART A

Q.1) All questions are compulsory

A) Multiple Choice Questions:

(10x1=10)

- a) _____ is a network that covers geographic areas that are larger, such as districts or cities
- i) LAN ii) MAN iii) WAN iv) None of these
- b) The first operational computer network in the world was the _____ for the United States Department of Defense
- i) ARPANET
ii) ERNET
iii) SKYNET
iv) DARPANET
- c) A computer network permits sharing of
- i) Resources
ii) Information
iii) Both a & b
iv) None of these
- d) _____ layer ensures that the communications passing through are in the appropriate form for the recipient.
- i) Presentation
ii) Network
iii) Data link
iv) Session

e) The third level of the OSI model and responsible for data routing paths for network communication is _____ layer.

- i) Physical
- ii) Network
- iii) Data link
- iv) Transport

f) In OSI model, _____ layer supports the electrical or mechanical interface to the physical medium.

- i) Physical
- ii) Network
- iii) Data link
- iv) Transport

g) Unguided communication media is

- i) coaxial cable
- ii) fiber optic cable
- iii) twisted pair cable
- iv) satellite

h) Which of the following represents the fastest data transmission speed?

- i) Gbps
- ii) Kbps
- iii) Bps
- iv) Bandwidth

i) Refers to information that is continuous.

- i) Analog data
- ii) Digital data
- iii) Analog signal
- iv) Digital signal

j) Which of the following is not a transmission medium?

- i) Microwave systems
- ii) ii)Telephone lines
- iii) Coaxial cable
- iv) iv)Modem



B] Very Short question

(5x2=10)

- i) What is TCP?
- ii) What do you mean by Parity Bit?
- iii) What is burst Error?
- iv) What do you mean by router?
- v) What is Modem?

PART B

Q2. Answer any four:

(4x5=20)

- i) What you mean by Topology? Explain different types of Topologies.
- ii) What do you mean by ARPANET?
- iii) What do you mean by flow control?
- iv) What do you mean by Client server Architecture ?
- v) What do you mean by Transmission Impairment?
- vi) What do you mean by Piggybacking?

PART C

Answer any three:

(3x10=30)

- Q.3) what do you mean by Network? What are the benefits of using Network? Explain its types.
- Q.4) what do you mean by Retransmission Transmission strategy? Explain are its different types?
- Q.5) what do mean by routing? What are different types of routing? Explain with example.
- Q.6) what do you mean by switching? What are the different types of switching network?
- Q.7) What do you mean by TCP/IP Model? Explain in detail.
- Q.8) What is do you mean by Wireless transmission? What are its types? Explain.



ARKA JAIN University, Jharkhand

1stSemester Examination – 2017-18

Subject :DAA

Time : 3 Hours

Course: BCA/Bsc.IT

Full Marks : 70

Pass Marks: 28

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PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions:

(10x1=10)

- a) Complexity for sorting following numbers using quick sort
2, 6,16,21,22,26,42,48
- a)24
b) 64
c) 8
d) None of these
- b) Complexity of linear search
- i) $O(n^2)$
ii) $O(n)$
iii) $O(n^{\log n})$
iv) $O(\log n)$
- c) Which among the following is the best sorting if the array is already sorted
- i) Bubble sort
ii) Quick sort
iii) Heap sort
iv) Merge sort
- d) Which of the following data structure is non linear type?
- i) Strings
ii) Lists
iii) Stacks
iv) Graph
- e) Match the following.
- | | |
|---------------------|---|
| a) Completeness | i) How long does it take to find a solution |
| b) Time Complexity | ii) How much memory need to perform the search. |
| c) Space Complexity | iii) Is the strategy guaranteed to find the solution when there in one. |
- i) a-iii, b-ii, c-i
ii) a-i, b-ii, c-iii
iii) a-iii, b-i, c-ii
iv) a-i, b-iii, c-ii

f) State True or False.

a) Binary search is used for searching in a sorted array.

b) The time complexity of binary search is $O(\log n)$.

- i) True, False
- ii) False, True
- iii) False, False
- iv) True, True

g) The run time of quick sort heavily depends on?

- i) last element
- ii) position
- iii) pivot element
- iv) None of these

h) A data structure where elements can be added or removed at either end but not in the middle is called ...

- i) linked lists
- ii) stacks
- iii) queues
- iv) dequeue

i) Which of the following algorithm uses divide and conquer approach

- i) kruskal's
- ii) maxima-minima
- iii) Prims algorithm
- iv) none of the above

j) Complexity of quick sort for worst case

- i) $O(\log n)$
- ii) $O(n^2)$
- iii) $O(n \log n)$
- iv) $O(n)$

B) Very Short question

(5x2=10)

- a) Distinguish between Algorithm and Pseudocode?
- b) Explain the properties/characteristics of an algorithm?
- c) What is meant by Divide – and – Conquer approach?
- d) State the Greedy Knapsack Problem?
- e) Define any three Asymptotic Notations?

PART B

Q2. Answer any four:

(4x5=20)

- i) Write strassen's algorithm?
- ii) Write prims algorithm?
- iii) Write an algorithm for insertion sort?
- iv) State and explain recurrence relation? State masters theorem?
- v) Explain single source shortest path with example?

- vi) Write the quick sort algorithm. Trace the same on data set 5, 3, 1, 9, 8, 2,4,7. Take the last element as pivot element?

PART C

Answer any three:

(3x10=30)

Q.3) Write an algorithm on maxima and minima? Perform the algorithm on following array?

23	65	18	85	72	02	15	64	50
----	----	----	----	----	----	----	----	----

Q.4) Write an algorithm on knapsack problem using greedy method and Find an optimal solution to the knapsack instance $n=7$ objects and the capacity of knapsack $m=15$. The profits and weights of the objects are $(P_1, P_2, P_3, P_4, P_5, P_6, P_7) = (10, 5, 15, 7, 6, 18, 3)$ $(W_1, W_2, W_3, W_4, W_5, W_6, W_7) = (2, 3, 5, 7, 1, 4, 1)$?

Q.5) Write an algorithm on binary search using divide and conquer? Drive its complexity? What is a greedy approach?

Q.6) What is graph? State and Explain Breadth first search and depth first search?

Q.7) write sort notes on

- MULTISAGE GRAPH
- N-Queen problem
- graph coloring
- Hamiltonian cycle

Q.8) write kruskel's algorithm and apply the same to find single source problem for the following garph taidng vertex ,aas source

