ARKA JAINUniversity, Jharkhand

3rd SemesterFinalExamination – ~~2018-19~~

2019-20

Subject: Programming in Java
Course:BCA/BSc-IT

Full Marks: 70
Pass Marks:

Time: 3 Hours

28

- 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

Q1.)All questions are compulsory:-

A] Objective Answer Type

10x1=10)

i) What is the name of the method used to start a thread execution?
   a) init()
   b) start()
   c) run()
   d) resume()

ii) What will be the output of the program?

```
public class My Program
{
    public static void main(String args[])
    {
        try
        {
System.out.print("Hello world ");
        }
        finally
        {
System.out.println("Finally executing ");
        }
    }
}
```

   a) Nothing. The program will not compile because no exceptions are specified.
   b) Nothing. The program will not compile because no catch clauses are specified.
   c) Hello world.
   d) Hello world Finally executing

iii) What allows the programmer to destroy an object x?

    a) x.delete ()
    b) x.finalize ()
    c) Runtime.getRuntime().gc()
    d) Only the garbage collection system can destroy an object.

iv) What is the most restrictive access modifier that will allow members of one class to have access to members of another class in the same package?

    a) public
    b) abstract
    c) default
    d) protected

v) Which one creates an instance of an array?

    a) int[ ] ia = new int[15];
    b) int ia[ ] [ ] = { 4, 5, 6 }, { 1,2,3 };
    c) char[ ] ca = "Some String";
    d) float fa = new float[20];

vi) Which is true?

    a) "X extends Y" is correct if and only if X is a class and Y is an interface
    b) "X extends Y" is correct if and only if X is an interface and Y is a class
    c) "X extends Y" is correct if X and Y are either both classes or both interfaces
    d) "X extends Y" is correct for all combinations of X and Y being classes and/or interfaces

vii) Which of these operators can be used to concatenate two or more String objects?

    a) +=
    b) &
    c) +
    d) ||

viii) Which of these methods can be used to output a sting in an applet?

    a) display()
    b) transient()
    c) drawString()
    d) print()

ix) Which of this method of class String is used to extract a single character from a String object?

    a) CHARAT()
    b) CharAt()
    c) charAt()
    d) charat()

nich of the following will directly stop the execution of a Thread?
a) wait()
b) notify()
c) Notify All()
d) exits synchronized code

B] Short Answer Type
(5x2=10)

i) Write any four differences between C++ and Java.
ii) What is the use of final keyword?
iii) What is the need for static variables?
iv) What is garbage collection?
v) What is the difference between **throw** and **throws**?

PART B

Q2.) **Answer any four:** (4x5=20)

i) In how many ways can you compare two strings in Java? Show with examples.
ii) Differentiate between overloading and overriding.
iii) Explain the different states of thread.
iv) Discuss any5 classes under the Lang package.
v) Differentiate between abstract class and interface.
vi) Explain Applet Life Cycle with the help of a diagram.

PART C

Answer any Three: (3x10=30)

Q3) Write a program in Java to create your own exception, throw and handle it.

Q4) Write a program in Java to create an abstract class which contains an abstract method as well.

Q5) Write a Java program to reverse a string.

Q6) Write a program in Java to count the vowels and consonants in a given input string.

Q7) Write a program in Java to check whether a number is palindrome or not.

Q8) WAP in Java to draw an oval in an applet window and fill it with red color.

18/11/19

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2019-20

Subject: Design And Analysis of Algorithm   Course: BCA/BSc-IT
                                                              Full Marks: 70
Time: 3 Hours   Pass Marks: 28

- 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

Q1.)All questions are compulsory:-

A] Objective Answer Type   **(10x1=10)**

i.   Steps of Divide and Conquer approach Select one:
      a) Divide, Conquer and Combine
      b) Combine, Conquer and Divide
      c) Combine, Divide and Conquer
      d) Divide, Combine and Conquer

ii.   The complexity of searching an element from a set of n elements using Binary search algorithm
      is Select one:
      a) O(n log n)
      b) O(log n)
      c) O(n2)
      d) O(n)

iii. Division Pattern of Problems in Divide and Conquer approach Select one:
      a) Iterative
      b) Recursive
      c) Parallel
      d) Random

iv.   Time complexity of matrix chain multiplication Select one:
      a) O(n2)
      b) O(n)
      c) O(nlogn)
      d) O(n3)

v.   The worst-case time complexity of Quick Sort is_____.
      a) $O(n^2)$
      b) O(nlogn)
      c) O(logn)
      d) O(n)

vi.   Two main measures for the efficiency of an algorithm are

a) Processor & Memory
b) Complexity & Capacity
c) Time & Space
d) Data & Space

vii. The concept of order Big O is important because
    a) It can be used to decide the best algorithm that solves a given problem.
    b) It is the lower bound of the growth rate of algorithm.
    c) It determines the maximum size of a problem that can be solved in a given amount of time.
    d) Both a and b

viii. The average-case time complexity of Insertion Sort is_____.
    a) $O(n^2)$
    b) $O(nlogn)$
    c) $O(1)$
    d) $O(n)$

ix. Time complexity of knapsack 0/1 where n is the number of items and W is the capacity of knapsack. Select one:
    a) $O(W)$
    b) $O(n)$
    c) $O(nW)$
    d) $O(1)$

x. The Data structure used in standard implementation of Breadth First Search
    a) Stack
    b) Queue
    c) Linked List
    d) None of the mentioned

B] Short Answer Type   (5x2=10)

What is a pseudo code?
What are the application of divide and conquer algorithm?
What is Greedy Algorithm?
Explain Breadth First Search.
Define N-Queen problem

PART B

Q2.)   Answer any four: (4x5=20)

i) What is an algorithm? Write down its major characteristics.
ii) Write an iterative algorithm for Binary Search.
iii) Define optimal merge pattern. Let the files are x1,x2,x3,x4 and x5 are to be merged with 20,30,10,5 and 30 records respectively. Apply greedy method to find the optimal merge pattern.
iv) What do you mean by Traveling Salesman Problem? What is Graph Coloring?
v) What do you understand by performance analysis of an algorithm? Define the two units to measure the same.
vi) What is a minimum spanning tree? Write Kruskal's Algorithm with its time complexity.

PART C

**Q3.)** Solve to find maximum and minimum element using divide and conquer.

82	36	49	91	12	14	6	76	92	55

Q4.) Solve the function and find out theta, omega and big-oh
$$F(n) = 2n+5$$

Q5.) Write an algorithm for insertion sort and analyze its complexity.

Q6.) Explain Breadth First Search Algorithm with suitable example.

Q7.) Explain kruskal's algorithm. Find minimum Spanning tree from the given graph.
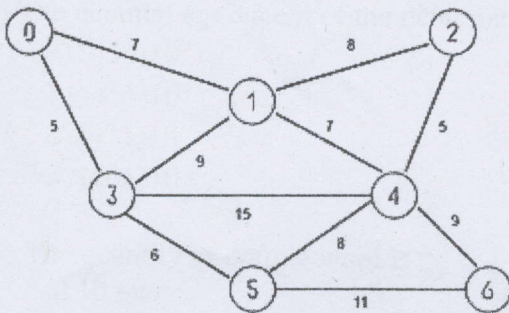
Q8.) Write short notes on any two

    a. Adjacency lists
    b. Sum of Subsets
    c. Minimum Spanning Tree
    d. Hamiltonian Cycle

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject : Digital Electronics

Time : 3 Hours

Course: BCA
Full Marks: 70
Pass Marks: 28

- 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)**

i) What is the addition of the binary numbers 11011011010 and 010100101?
   a) 0111001000
   b) 1100110110
   c) 11101111111
   d) 10011010011

ii) The decimal equivalent of the octal number $(645)8$ is _____
   a) $(450)10$
   b) $(451)10$
   c) $(421)10$
   d) $(501)10$

iii) The quantity of double word is _____
   a) 16 bits
   b) 32 bits
   c) 4 bits
   d) 8 bits

iv) The largest two digit hexadecimal number is _____
   a) $(FE)16$
   b) $(FD)16$
   c) $(FF)16$
   d) $(EF)16$

v) According to Boolean law: A + 1 = ?
   a) 1
   b) A
   c) 0
   d) A'

---

vi) According to boolean law: A(A + B) = ?
    a) AB
    b) 1
    c) (1 + AB)
    d) A

vii) There are _____ cells in a 4-variable K-map.
    a) 12
    b) 16
    c) 18
    d) 8

viii) If A and B are the inputs of a half adder, the sum is given by _____
    a) A AND B
    b) A OR B
    c) A XOR B
    d) A EX-NOR B

ix) The expression Y=AB+BC+AC shows the _____ operation.
    a) EX-OR
    b) SOP
    c) POS
    d) NOR

x) In a multiplexer the output depends on its _____
    a) Data inputs
    b) Select inputs
    c) Select outputs
    d) Enable pin

B] Very Short question
    a) List out the Basic Logic Gates.   (5x2=10)
    b) Convert the following Decimal numbers into Binary number system
    (a) 43   (b) 68
    © Find the 1s complement of the following numbers
        (a) 1010 (b) 1111
    c) Convert the following from Gray Code to Binary code
      a. (a)10110 (b)10101101
    d) Write down the definition of Sequential circuit.
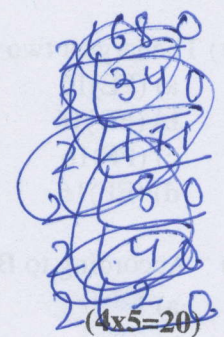
<center>**PART B**</center>

Q2. Answer any four: (4x5=20)
    i)   Explain the operation of Basic Logic Gates along with truth table.
    ii)   Using K map technique simplify
       (a)f(a,b,c,d) =Σ(8,10,12,14,15)
       (b)f(a,b,c,d) = Σ(1,3,5,7,8,9,12,13)
    iii)   State the De Morgan's Theorems for two variables.
    iv)   Explain the Binary Addition and Subtraction operation with example.
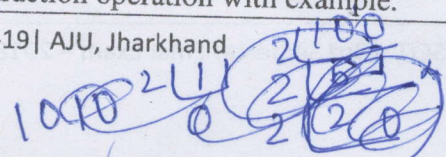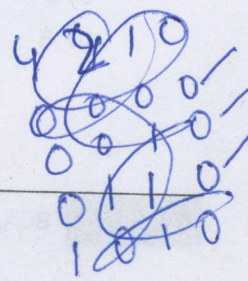
v)   Explain Half Adder .(implementation using Logic gates)

vi)   Explain the concept of latch.

PART C

Answer any three: (3x10=30)

Q.3 Explain the Universal Properties of following Gates.

    a)NAND gate   (b) NOR gate

    c) Realize $((A+B)'*C)$ using   d) NAND gate only.

Q.4) Explain the concept of multiplexing using 4:1 MUX with schematic.

Q.5) Explain the BCD to Decimal decoder with schematic.

Q.6) Draw the Logic circuit of clocked D flip flop. Explain its functioning and write its Truth Table.

Q.7) what do you mean by a counter? Write down the difference between Synchronous and asynchronous Counter.

Q.8) Explain JK flip flop with schematic.

ARKA JAIN University, Jharkhand

3rd Semester final Examination – 2019-20

Subject: Data Communication & Networking

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**
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PART A

Q.1) **[A] Multiple Choice Questions** (10x1=10)

i. In cryptography, what is cipher?
   a) algorithm for performing encryption and decryption
   b) encrypted message
   c) both algorithm for performing encryption and decryption and encrypted message
   d) none of the mentioned

ii. In TDM, slots are further divided into _____
   a) Seconds
   b) Frames
   c) Packets
   d) None of the mentioned

iii. The main reason for transition from IPv4 to IPv6 is
   a) Huge number of systems on the internet
   b) Very low number of system on the internet
   c) Providing standard address
   d) None of the mentioned

iv. What is internet?
   a) a single network
   b) a vast collection of different networks
   c) interconnection of local area networks
   d) none of the mentioned

v. WiMAX uses the
   a) orthogonal frequency division multiplexing
   b) time division multiplexing
   c) space division multiplexing
   d) all of the mentioned

vi. Ethernet frame consists of
   a) MAC address
   b) IP address
   c) both MAC address and IP address
   d) none of the mentioned

vii.   MAC address is of
    a) 24 bits
    b) 36 bits
    c) 42 bits
    d) 48 bits

viii.   High speed Ethernet works on
    a.   coaxial cable
    b.   twisted pair cable
    c.   optical fiber
    d.   none of the mentioned

ix)   HTTP is _____ protocol.

    a.   application layer
    b.   transport layer
    c.   network layer
    d.   none of the mentioned

x) The entire hostname has a maximum of _____

    a) 255 characters
    b) 127 characters
    c) 63 characters
    d) 31 characters

[B] Attempt All
                                                                   (2*5=10)

    a)   Draw the 7-layers OSI reference model.
    b)   What is Shannon capacity for Noisy Channel?
    c)   What is Attenuation?
    d)   Draw the frame diagram of IPv4.
    e)   Write about Digital Signals.

PART B

Q.2) Answer any Two:
                                                                     (4x5=20)

    a)   Introduce IEEE 802.11 & its architecture.
    b)   Design a 7 bit hamming code for a 4-bit data that is 1011 by using even parity as well as odd parity method.
    c)   What is transaction of IPv4 to IPv6. Why it has needed?
    d)   Write about Time Division Multiplexing
    e)   Explain Cellular telephony.
    f)   Write about the various interfacing devices.

PART C

Q.3) Attempt any three
                                                                        (3x10=30)

    a.   What is error detection? List various methods of error detection & correction & explain any two of them.
    b.   Explain various Analog to Analog Conversion Techniques.
    c.   Write short notes on a) HTTP   b) FTP   c) Tel-Net   d) DNS
    d.   What is cryptography? Explain various types of cryptography.
    e.   Explain the various types of Circuit switching with their diagram.

ARKA JAINUniversity, Jharkhand

3rdSemesterFinal Examination – 2019-20

Subject:Database Management systems

Time: 3 Hours

Course:BCA
Full Marks: 70
Pass Marks: 28

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PART A

Q1.)All questions are compulsory:-

A] Objective Answer Type   **(10x1=10)**

i.   .... command can be used to modify a column in a table
  A. alter
  B. update
  C. set
  D. create

ii.   DBMS is a collection of .... that enables user to create and maintain a database.
  A) Keys
  B) Translators
  C) Program
  D) Language Activity

iii.   In an ER model, ... is described in the database by storing its data.
  A) Entity
  B) Attribute
  C) Relationship
  D) Notation

iv.   Grant and revoke are .... statements.
  A. DDL
  B. TCL
  C. DCL
  D. DML

v.   A top-to-bottom relationship among the items in a database is established by a
  A) Hierarchical schema
  B) Network schema
  C) Relational Schema
  D) All of the above

vi.   Key to represent relationship between tables is called
  A. primary key
  B. secondary key
  C. foreign key
  D. none of the above

vii.   ....defines the structure of a relation which consists of a fixed set of attribute-domain pairs.
    A) Instance
    B) Schema
    C) Program
    D) Super Key

viii.   A .... is used to define overall design of the database
    A. schema
    B. application program
    C. data definition language
    D. code

ix.   In a relational schema, each tuple is divided into fields called
    A) Relations
    B) Domains
    C) Queries
    D) All of the above

x.   .... is a full form of SQL.
    A) Standard query language
    B) Sequential query language
    C) Structured query language
    D) Server side query language

B] Short Answer Type   (5x2=10)

    i)   What is a Data Model?
    ii) What are the features of good relational database?
    iii) What is selection in relational algebra?
    iv) What is Transaction Control Management?
    v)   What do you mean by PL-SQL?

PART B

Q2.)   Answer any four: (4x5=20)

    i)   What is Normalization? Explain all the normal forms with suitable examples.
    ii) Explain the database architecture.
    iii) What are the limitations of file Based approach System?
    iv) What is Join? What are the different types of joins with suitable examples?
    v)   What is ACID Property? Explain in detail. Explain Serialize ability.
    vi) What is Deadlock? How to avoid deadlock in DBMS?

PART C

Q3.) Explain Codd's rule in details with suitable examples.

Q4.) What is Trigger? Explain with suitable example how to execute trigger in DBMS.

Q5.) Explain in detail the Components of ER-Model. Draw ER-Model with taking suitable attributes in bank Database.

Q6.) What is database recovery? How to recover if any transaction is failed? Explain with suitable example.

Q7.) What are the different types of locks in concurrency control? Explain 2-Phase locking.

Q8.) Write short notes on any two

    a.   Schema
    b.   Relational Algebra
    c.   Data Independence
    d.   Store Procedure

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2019-20

Subject : Python Programming

Time : 3 Hours

Course: BCA/B.Sc(IT)
Full Marks : 70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
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PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions:

(10x1=10)

i) Is Python case sensitive when dealing with identifiers?
i)   yes
ii)   no
iii)   machine dependent
iv)   none of the mentioned

ii) Which operator is used to find the remainder?
i)   &
ii)   %
iii)   !
iv)   =

iii) Which of these in not a core data type?
i) Lists
ii) Dictionary
iii) Tuples
iv) Class

iv) What is the order of precedence in python?
i) Parentheses
ii) Exponential
iii) Multiplication
iv) Division
v) Addition
vi) Subtraction

a) i,ii,iii,iv,v,vi
b) ii,i,iii,iv,v,vi
c) ii,i,iv,iii,v,vi
d) i,ii,iii,iv,vi,v

v) Which is the correct operator for power(xy)?
i)   x^y
ii)   x**y
iii)   x^^y
iv)   none of the mentioned

vi) What is the output when we execute list("hello")?
    a) ['h', 'e', 'l', 'l', 'o']
    b) ['hello']
    c) ['llo']
    d) ['olleh']

vii) Which keyword is use for function?
    a) Fun
    b) Define
    c) Def
    d) Function

viii) What will be the output of the following Python code?
    >>>str="hello"
    >>>str[:2]
    >>>
    a) he
    b) lo
    c) olleh
    d) hello

ix) Where is function defined?
    a) Module
    b) Class
    c) Another function
    d) All of the mentioned

x) Which of the following commands will create a list?
    a) list1 = list()
    b) list1 = []
    c) list1 = list([1, 2, 3])
    d) all of the mentioned

B] Very Short question
a) Write down any 5 keywords in Python.   (5x2=10)
b) List out different Logical operators in python and write down their functions also.
c) Define fruitful and void functions.
d) Write down the definition of List & Tuple.
e) Explain the following:
(i) input () (ii) augmented statement ()

PART B

Q2. Answer any four:

                                       (4x5=20)

  i)   How does computer run a python program? Explain with neat diagram.
  ii)   Write a Python program to generate the Fibonacci series.
  iii)   What are the different Loops available in python?
  iv)   List the features and explain about different Object Oriented features supported by Python.
  v)   Define module. What are the two ways of exporting module explain?
  vi)   How to declare a constructor method in python? Explain in brief.

Answer any three: (3x10=30)

Q.3) Give the syntax of User defined function in python and explain the working with an example.

Q.4) Using loops print the following pattern:

PPPP
PPP
PP
P

Q.5) Using string Methods write an expression that produces:

(a) No of letters in zomato.

(b) No of 'o' in zomato

© The index of the first occurrences of 'o' in zomato.

Q.6) With the help of Python program explain the concept of Inheritance .

Q.7) Explain Dictionary in Python with example.

Q.8) Write a Python program that creates a GUI with a textbox, Ok button and Quit button. On clicking Ok, the text entered in textbox is to be printed in Python shell; on clicking Quit, the program should terminate.

Subject: Database Management System Lab

Time: 3 Hour

Course: BCA
Full Marks: 30
Pass Marks: 12

- Candidates are required to give their answers in their own words as far as practicable.
- Write the program first in the answer sheet and submit it.
- After submitting the Answer booklet code the program on the computer. Submit the soft copy of the program with the invigilator.

Answer any ONE

1. Consider the following database consisting of the following tables:

    Employee (Empname, Street, City)
    Works (Empname, Companyname, Salary)
    Company (Companyname, City)
    Manages (Empname, Managername)

Write the following queries in SQL

a. Find the names of all employees who work for First Bank Corporation.
b. Find the names, street addresses and cities of residence of all employees who work for the First Bank corporation and earn more than 200,000 per annum.
c. Find the names of all employees in this database who live in the same city as the company for which they work.
d. Find the number of employees working in each company.
e. Find the average, maximum and minimum salary for each company.

2. Consider the following database consisting of the following tables:

    Customer (Custno, CName, City)
    Order (Orderno, Orderdate,Custno,Amount)
    Order_item(Orderno,Itemno,Qty)
    Item (Itemno, Unitprice)

Write the following queries in SQL

a. Retrieve the number and date of orders places by customers residing at Atlanta City.
b. Retrieve the number and unit price of items for which an order of quantity greater than 50 is placed.
c. Retrieve the order number,date and item numberfor the order of items having a unit price greater than 20.
d. Retrieve details of customers who have placed an order for the item number 1010.
e. Retrieve the number and unit price of items for which an order is placed by a customer number C001.

JGi

Subject: Programming in Java - Lab

Time: **3** Hours

Course: **BCA/BSc-IT**
Full Marks: 30
Pass Marks: 12

- Candidates are required to give their answers in their own words as far as practicable.
- Answer any one question.
- Write the program first in the answer sheet and submit it.
- After submitting the Answer booklet code the program on the computer. Submit the soft copy of the program with the invigilator.

Q1. Write a program in Java to print the following pattern.

```
11  21  31  41  51
12  22  32  42  52
13  23  33  43  53
14  24  34  44  54
15  25  35  45  55
```

Q2. Write a program to input n numbers in an array and sort them in ascending order using Bubble Sort.

Q3. Write a program to input a string and print the longest word along with its length.

ARKA JAIN University, Jharkhand

3rd Semester External Practical Examination – 2019-20

- Candidates are required to give their answers in their own words as far as practicable.
- Answer any **ONE**
- Answer the Program first in answer booklet and submit it.
- After answering in booklet, solve the program using Computer and submit the soft copy to the Invigilators

Q 1.(A) Write a Python program to generate the fibonacci series upto n-th term where n is provided by the user

(B) Write a Python program to input a number and determine whether the number is Armstrong number or not. For the same the user need to write the following functions:

    (i) Write a function to calculate x raised to the power y.

    (ii) Write function to calculate order of the number

    (iii) Write function to check whether the given number is Armstrong number or not

Q 2. (A) Write a Python program to configure the widget with various options like: bg="red", family="times", size=18

(B) Write a Python program to change the widget type and configuration options to experiment with other widget types like Message, Button, Entry, Checkbutton, Radiobutton, Scale, etc.