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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA201 ***Subject: Computer Networks***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Write short notes of the following **(Any five)**: **(5×5=25)**

a) What is the use of topologies in networking?
b) What do you understand by Line Configuration?
c) Explain Attenuation and Distortion.
d) How Synchronous TDM is different from Asynchronous TDM?
e) Differentiate between "packet switching" & "circuit switching".
f) How IPV4 is different from IPV6?
g) What is the difference between single bit error & burst error?

UNIT-I

Q2 a) Describe the components of Data Communication along with diagram. **(5)**

b) Explain OSI model. Write the functions and protocols of each layer. **(7.5)**

Q3 a) Define networking and its goals. **(5)**

b) Explain Transmission Impairment in detail. **(7.5)**

UNIT-II

Q4 a) What do you understand by Multiplexing? Describe WDM & FDM. **(5)**

b) Explain Hamming Code with the help of an example. **(7.5)**

Q5 a) Define Bit-Stuffing. How it is different from character stuffing? **(5)**

b) Explain any three error detection methods? **(7.5)**

UNIT-III

Q6 a) What do you understand by Routing? Differentiate between adaptive and non-adaptive routing. **(5)**

b) Describe repeater, router, switch, hub, bridge & gateway. **(7.5)**

Q7 a) Differentiate between Distance Vector Routing & Link State Routing. **(5)**

b) What is subnetting? Describe Unicast Routing Protocols. **(7.5)**

UNIT-IV

Q8 a) Compare the TCP header with UDP header. **(5)**

b) Explain Connection Management with the help of a diagram. **(7.5)**

Q9 a) Discuss the design issue of session layer. **(5)**

b) Describe any five protocols present on application layer with their functionality. **(7.5)**

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA-203 ***Subject: COMPUTER ORGANIZATION AND ARCHITECTURE***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit

Q1. Attempt the following **(any five)** **[5x5=25]**

(a) Why are NAND and NOR gates known as Universal Gates? Realize Ex-OR function using only NAND gates.

(b) Differentiate De-Multiplexer and decoder.

(c) What is instruction cycle? Draw a flowchart for instruction cycle of a basic computer?

(d) What is virtual memory and how does it works?

(e) Explain the advantage of SIPO over SISO. Discuss their applications.

(f) Design 4-bit Adder-Subtractor.

UNIT-I

Q2. (a) Draw K-Map and simplify the following expression:

$$f(P, Q, R, S) = \Sigma m (0, 1, 4, 5, 7, 8, 9, 12, 13, 15)$$ **[6.5]**

(b) Design a full adder using two half adder and OR gate. **[6]**

Q3. (a) Reduce the following Boolean expression using Boolean laws.

Y=AB+A'B+AB'+(AB)' and also design using basic logic gates. **[6.5]**

(b) Design a 3:8 decoder using basic logic gates. **[6]**

UNIT-II

Q4. (a) What is shortcoming in J-K flip flop? Explain how its shortcoming is removed. Describe its operating principle. **[6.5]**

(b) Design 3-bit synchronous counter and draw output waveform. **[6]**

Q5. (a) Describe the operation of 4- bit bidirectional shift register with the help of block diagram. **[6.5]**

(b) Realize D type flip-flop using J-K flip flop. **[6]**

UNIT-III

Q6. (a) Explain instruction formats and its types using the following expression: X=(A+B)-(C+D). **[6.5]**

(b) What is register transfer language? Explain with the help of example. **[6]**

P.T.O.

BCA-203

P1/2

Q7. (a) Explain the different types of addressing modes in basic computer. **[6.5]**

(b) What is meant by micro-operation? Explain the term selective set, selective compliment, selective clear micro operation? **[6]**

UNIT-IV

Q8. (a) What is asynchronous data transfer? Explain different methods of asynchronous data transfer. **[6.5]**

(b) What is DMA? Draw and explain the DMA controller in details. **[6]**

Q9. Write short notes on the following:- **[12.5]**
1. Cache Memory 2. Auxiliary Memory 3. Associative Memory 4. EPROM 5. RAM

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P2/2

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA 205 ***Subject: Object Oriented Programming with C++***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No. 1 which is compulsory. Select one question from each unit.

Q1. Write the short note on the following:- **(2.5X10=25)**

(a) Inline function
(b) Describe the various benefits of OOP.
(c) New Vs Delete
(d) Static data member
(e) Copy constructor
(f) Virtual base class
(g) Friend function
(h) Class template
(i) This pointer
(j) Early Vs Late binding

UNIT-I

Q2. (a) Explain the following terms: **(4)**
(i) Literals (ii) Implicit conversion
(b) Write a program that will find out whether the given number is even or odd.
If it is odd number then find out whether it is prime or not? **(3.5+5=8.5)**

Q3. (a) Illustrate the comparison between C and C++. **(4.5)**
(b) Describe the concepts of parameter passing by value, reference and pointer with the help of an example. **(8)**

UNIT-II

Q4. (a) Explain the concept of constructor overloading and function overloading. **(6)**
(b) What do you understand by access specifiers? What are these access specifiers? **(6.5)**

Q5. (a) Define a class Teacher with the following specifications: **(10)**
Private members:
Name 20 characters
Subject 10 characters
Basic, DA, HRA float
Salary float
Calculate ( ) function computes the salary and returns it. Salary is sum of Basic, DA and HRA

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Public members:

Readdata ( ) function accepts the data values and invokes the calculate function.

Displaydata ( ) function prints the data on the screen.

(b) What are the special properties of a constructor? **(2.5)**

UNIT-III

Q6. (a) How can a data member and member function present in public mode in class be accessed through pointer object? Explain it by taking an example. **(6)**

(b) Create class COMPLEX and overload binary + operator to add objects. Using friend functions. **(6.5)**

Q7. Define an inheritance and its advantage? Explain the types of inheritance. **(2.5+10=12.5)**

UNIT-IV

Q8. (a) What do you mean by generic programming? Write a program to swap the any two different types of variables using function template. **(2+4=6)**

(b) Create a class Stack that throws Overflow and Underflow exceptions. **(6.5)**

Q9. (a) Explain the following terms: **(6)**

(i) seekg () (ii) getline () (iii) write ()

(b) What is the file access mode? Describe the various file modes. **(6.5)**

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END TERM EXAMINATION

THIRD SEMESTER [BCA] FEBRUARY 2023

Paper Code: BCA-207 ***Subject: Human Values & Ethics***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit.

Q1 Write short notes on any five: **(Any Five)** **(5x5=25)**

(a) Define Value. Explain the Value of a human being with a few examples.

(b) Define Skill? Elaborate on it with a few examples. Highlight the difference between Values and Skills?

(c) List any three implications of Value education? Explain how they are related to your life?

(d) Define Ethics. How are values and ethics are related?

(e) The process of Value education has been proposed as 'self-exploration'. What could be some other possibilities for the process of value education?

(f) Why is right understanding required in relationship for mutual happiness? Illustrate with the help of two personal examples?

UNIT-I

Q2 What does a fulfilling life mean for you? List out the top five points that occur to you when you think of a fulfilling life. While making the list, consider your entire life, not just the present stage of your life (youth, middle age, old age ,etc.) **(12.5)**

Q3 Distinguish between 'human consciousness 'and 'animal consciousness. And also describe the societal impact of living with human consciousness? **(12.5)**

UNIT-II

Q4 What are the three elements of Indian ethos? Explain the ethics of Vedanta in management? **(12.5)**

Q5 Critically examine the prevailing notions of happiness and prosperity in the society. What are the consequences of these notions? **(12.5)**

UNIT-III

Q6 (a) "I am the seer, doer and enjoyer? The body is an instrument". Explain with an example of each. **(4.5)**

(b) What is excellence? Is working for competition the same as working for excellence? Explain with the help of examples? **(8)**

Q7 'There is definitiveness in the human conduct just in the same way as there is definitiveness in the characteristics of a mango tree or a horse etc. but this definiteness becomes evident only through right understanding '. Give your comments on the statement with justification. **(12.5)**

UNIT-IV

Q8 (a) What are the four levels in universal human values and professional ethics? What could be your role in moving towards universal human order? **(4.5)**

(b) 'Values effect both the structure as well as the utilization of technologies'. Do you agree? Give justifications for your response? **(8)**

Q9 What are the various ethical issues in Cyber crime and what is effect of cybercrime in human life? **(12.5)**

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCAT-213 ***Subject: Cyber Security***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1. Write short notes on the following **(Any Five)**: **(5x5=25)**

(a) Explain the concept of Data Security Council of India.
(b) Define main techniques hackers can use to get hold on your password.
(c) Define Digital Signature algorithm.
(d) Write down the steps involved in computer forensic investigation.
(e) Explain the differences between Virus, Worms, and Trojan horse.
(f) Compare between Symmetric key encryption and Asymmetric key encryption.
(g) What are the categories of Computer Society?
(h) Explain the concept of IPC 1980.

UNIT-I

Q2. (a) What is Cybercrime? How it is classified? What are the different types of cybercrimes towards an individual? **(6.5)**
(b) Explain various criminal attacks in detail? **(6)**

Q3. (a) What is the data security consideration? Explain in this reference Data Backup security, Data archival security and Data disposal consideration. **(6.5)**
(b) Elaborate the concept of cyberstalking in detail. **(6)**

UNIT-II

Q4. (a) Define DoS and DDoS Attacks in brief. What are the techniques behind such attacks? **(6.5)**
(b) Explain the term Hacking. What are the various classifications of hackers? **(6)**

Q5. (a) What is password cracking? List four guidelines that need to be followed to avoid password cracking. **(6.5)**
(b) Explain the term Phishing. Write down various methods or activities which constitute phishing. **(6)**

UNIT-III

Q6. (a)Explain the architecture of firewall. What are the various characteristics of firewall? **(6.5)**
(b) Explain the S-MIME protocol for secure E-Mail. **(6)**

P.T.O.

Q7. (a)Explain the concept of cryptography by using the diagrammatical approach of it? Define the transformation method of it. **(6.5)**

(b)Explain the following terms: **(6)**

(a) Bit-stream image
(b) Chain of custody
(c) Evidence custody form

UNIT-IV

Q8. (a) Explain Software piracy. Write down various activities that constitute software piracy. **(6.5)**

(b) What are the requirements to set up a workstation for computer forensics? **(6)**

Q9. (a) What are the different acquisition tools in forensics? Explain. **(6.5)**

(b) Explain the legal process to conduct computer investigation for potential criminal violations of law. **(6)**

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA 221 ***Subject: Principles of Management & Organizational Behaviour***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No. 1 which is compulsory. Select one question from each unit.

Q1. Write short notes of the following **(Any Five)**: **(5x5=25)**

(a) Define self-learning.
(b) Discuss different roles and function of a Manager.
(c) Differentiate between authority and responsibility.
(d) Stereotyping.
(e) Describe theory of cognitive dissonance.
(f) Hallo effect.

UNIT-I

Q2. (a) "Management is the art of getting things done". Do you agree? Give reasons. **(6)**
(b) Explain the Managerial Levels in an organization. **(6.5)**

Q3. (a) How pertinent today is Taylor's assumption that management and labour had a common cause. Explain your view with justification. **(7.5)**
(b) Differentiate between Effectiveness Vs Efficiency. **(5)**

UNIT-II

Q4. (a) 'Decision making is the essence of managing.' Comment and explain the features of a rational decision. **(7)**
(b) "Planning is mere ritual in the fast-changing environment." How far do you agree with this statement? Why? **(5.5)**

Q5. (a) "Planning is nothing without control and control is aimless without planning". Explain the statement with examples. **(6.5)**
(b) Differentiate between Long term planning and short term planning. **(6)**

UNIT-III

Q6. (a) "Organizational Behavior represents interactions among individuals, groups and the organization. Elucidate. **(6)**
(b) A large unit manufacturing goods which has been known for its HR policies and fringe benefits is facing the problem of low productivity and high absenteeism. How should the management improve the organizational climate? **(6.5)**

Q7. (a) "Motivation is the core of management". What are the suggestion would you offer to the management to motivate its staff? **(5.5)**

P.T.O.

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P1/2

(b) Distinction between Maslow and Herzberg theories of motivation. What is the role of money/monetary benefits in motivating the managers? **(7)**

UNIT-IV

Q8. (a) Define Organizational Behavior and explain the need of understanding human behavior in organizations. **(6)**

(b) Explain the concept of personality. Discuss personality traits that affect the human behavior. **(6.5)**

Q9. (a) 'If organizational change is to be real change, it has to happen at the level of culture.' Elaborate this statement. **(6.5)**

(b) "Perception is a process of input- throughput- output Analysis". Comment and examples of perceptual sets from work settings. **(6)**

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA-201 ***Subject: Mathematics-III***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Use of calculator is permitted.

Q1 Attempt **any three** questions in brief:- **(3x5=15)**

(a) Define (i) Transportation problem (ii) Assignment problem (iii) LPP.

(b) The arithmetic mean of 50 items of a series was calculated by a student as 20. However, it was later discovered that an item 30 was misread as 40. Find the correct value of mean.

(c) Define (i) Ogives (ii) Histogram (iii) Lorenz curve.

(d) For a bivariate data, the mean value of X is 20, the mean value of Y is 45.The regression coefficient of Y on X is 4 and that of X on Y is 1/9. Find (i) The correlation coefficient.
(ii) The standard deviation of X if standard deviation of Y is 12.

(e) Solve the following LPP graphically
Minimize $Z = 3x+9y$
Subject to the constraints
$x+3y \leq 60$
$x+y \geq 10$
$x \leq y, \quad x, y \geq 0$.

UNIT-I

Q2 (a) Find out the missing frequencies from the given data: **(7)**

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	8	?	6	?	5	9	50

The arithmetic mean is 25.

(b) The following table gives the less than cumulative frequencies of 199 man, each of age 20 years or more, of a group: **(8)**

Age below (in years)	25	30	35	40	45	50	55	60	65	70
Cumulative Frequency	21	40	90	130	146	166	176	186	195	199

Find the mean age.

OR

Q3 (a) The marks obtained by 60 students in a certain paper out of 75 are given below: **(7)**

Marks	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
No. of students	4	5	11	6	5	8	9	6	4	2

Calculate the median.

(b) Find mean deviation about the mean for the following data: **(8)**

Xi	2	5	6	8	10	12
Fi	2	8	10	7	8	5

P.T.O.

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UNIT-II

Q4 (a) A computer while calculating r(XY) from 25 pairs of observation obtained the following values: n=25; $\sum X = 125$; $\sum Y = 100$, $\sum X^2 = 650$; $\sum Y^2 = 460$; $\sum XY = 508$. A recheck showed that he had copied wrong two pairs (6,14), (8,6) while the correct values were (8,12), (6,8). Obtain the correct value of co-relation coefficient. **(7)**

(b) Two judges in a beauty competition rank the 12 entries as follows: **(8)**

X	1	2	3	4	5	6	7	8	9	10	11	12
Y	12	9	6	10	3	5	4	7	8	2	11	1

What degree of agreement is there between the judgment of the two judges?

OR

Q5 (a) The lines of regression of a bivariate population are 8X-10Y+66=0 and 40X-18Y=214. The variance of X is 9. Find the mean values of X and Y. Also obtain the standard deviation of Y and the coefficient of correlation between X and Y. **(8)**

(b) Given below the data related to sale and purchase. Obtain the equation of two-regression lines. **(7)**

Purchase	62	72	98	76	81	56	76	92	88	49
Sales	112	124	131	117	132	96	120	136	97	85

UNIT-III

Q6 Solve the following LPP by using Big-M method. **(15)**

Maximize $Z=3x_1-x_2$

Subject to the constraints

$2x_1+x_2 \geq 2$

$x_1+3x_2 \leq 3$

$x_2 \leq 4$

and $x_1, x_2 \geq 0$

OR

Q7 Solve the following LPP. **(15)**

Minimize $Z=3x_1+2.5x_2$

Subject to the constraints

$2x_1+4x_2 \geq 40$

$5x_1+2x_2 \geq 50$

$x_1 \geq 0, x_2 \geq 0$

UNIT-IV

Q8 Five different machines can do any of five required jobs, with different profit resulting from each assignment as shown in the adjoining table. Find out maximum profit possible through optimal assignment. **(15)**

		Machines				
		A	**B**	**C**	**D**	**E**
Jobs	**1**	30	37	40	28	40
	2	40	24	27	21	36
	3	40	32	33	30	35
	4	25	38	40	36	36
	5	29	62	41	34	39

OR

Q9 A Company has four plants P_1, P_2, P_3, P_4 from which it supplies to three markets M_1, M_2, M_3. Determine the optimal transportation plan from the following data giving the plant to market shifting costs, quantities available at each plant and quantities required at each market. (Using Modi Algorithm) **(15)**

Plants / *Market*	P_1	P_2	P_3	P_4	*Required*
M_1	19	14	23	11	11
M_2	15	16	12	21	13
M_3	30	25	16	39	19
Availability	6	10	12	15	43

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END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCAT-211 ***Subject: Basics of Python Programming***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Answer **any five** the following: **(5x5=25)**

a) Explain the key features of Python?

b) Explain Mutable and Immutable Data types with example.

c) Consider a list L= [10, 20, 30, 40]. Find the output of following statements.

   a. L[0] = L[0] + 2
   b. L = L + 2
   c. L = L * 2
   d. L[1] = 50
   e. L = L[::-1]

d) Explain the following functions with example.

   i) update() ii) copy()

e) Explain the Dynamic Typing feature of Python with example.

f) Write the difference between indexing and slicing with example.

UNIT–I

Q2 a) Explain the following terms:- **(3½)**

(i) Pass (ii) Continue

b) Write a python script to print Fibonacci series for first 20 elements. **(4)**

c) Explain Entry – Controlled loops in Python with the help of programs. **(5)**

OR

Q3 a) What is the difference between interactive mode and script mode in python? **(3)**

b) Write a program that reads a string and check whether it is a Palindrome or not. **(5)**

c) Explain the following functions with example. **(4½)**

1. lstrip() 2. swapcase() 3. isspace()

UNIT–II

Q4 a) What is Tuple? How to define and access the elements of Tuple? Explain it with a code. **(6)**

P.T.O.

b) What is the output of the following code snippets? **(4)**

1.
```
t1 = (3)
t2 = (4,5,6)
t3 = t1 + t2
print(t3)
```

2.
```
d = dict()
d['left'] = '>'
d['right'] = '<'
print(d['left'] and d['right'] or d['right'] and d['left'])
print(d['left'] and d['right'] and d['right'] and d['left']and d['end'])
```

c) How are Dictionaries different from list? **(2½)**

OR

Q5 a) What is Dictionary? What are the different ways to create Dictionary? **(5)**

b) Explain the following methods of Lists with example: **(4)**
1. extend() 2. insert()

c) Given a tuple namely City storing cities names ('tokoyo', 'Delhi', 'Seoul', 'Jaipur', 'Paris', 'Luxembourg', 'Berlin', 'London', 'Moscow') as elements. Write a program to print names of the cities as well as their index in the index range 2 to 6, both inclusive. **(3½)**

UNIT–III

Q6 a) What is function? Explain the different types of arguments in function in Python. Illustrate with the help of programs. **(6½)**

b) Predict the output of the following code snippet: **(2)**

```
def add(a,b,c):
    print(x+y+z)

c = add(6,16,26)
```

c) Write a program to find factorial of a number using recursion. **(4)**

OR

Q7 a) What is the difference between Package and Module? What are the different ways to import a module in a program? **(5)**

b) Write a program that reads a number, then converts it into octal and hexadecimal equivalent using built-in functions of Python. **(3½)**

c) Differentiate between local and global variables in python with the help of a program. **(4)**

P.T.O.

UNIT–IV

Q8 a) Explain the following built-in methods of file. **(6)**
(i) read(n)
(ii) seek()
(iii) writelines()
(iv) tell()

b) List the advantages of NumPy Arrays over nested python list. **(3½)**

c) Explain the following functions with respect to Matplotlib. **(3)**
1. barh()
2. legend()

OR

Q9 a) Explain the different file opening modes with example. **(8)**

b) Explain the following function with respect to NumPy **(4½)**
(i) reshape()
(ii) ndim()

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