

Department: Computer Technology

Semester: VII

Section: A and B

CAT-I (2023-24)

Subject : Cryptography and Network Security

Subject Code : BTCT701T

Duration : 1.5Hrs

Max. Marks : 35

Note:

- 1) All questions are compulsory.
- 2) All questions carry marks as indicated.

Questions

Marks CO BL

- Q.1 A I Which of the following is not substitution cipher?

1M CO1 II

- a) Caesar Cipher
- b) Playfair Cipher
- c) Hill Cipher
- d) Railfence Cipher

II What is the purpose of Euclidean algorithm?

1M CO1 II

- a) To perform primality testing
- b) To compute GCD of two numbers
- c) To generate pseudo random numbers
- d) None of the above

B Explain in detail about various transposition ciphers used in cryptography.

5M CO1 II

C Demonstrate the working of encryption and decryption procedure in Hill Cipher with respect to following parameters:

7M CO1 III

Plain Text : HILLCIPHER

Key :

7	8
19	3

OR

Q.2 A I Caesar Cipher is an example of _____

1M CO1 II

- a) Substitution Cipher
- b) Transposition Cipher
- c) a and b both
- d) None of the mentioned

II The Vigenere cipher is an example of _____

1M CO1 II

- a) Poly alphabetic substitution cipher
- b) Transposition cipher
- c) Mono alphabetic cipher
- d) None of the above

B Explain in detail about Playfair Cipher and then apply it to encrypt with respect to: 5M CO1 III

Plain Text : CHANDRAYAAN

Keyword Matrix : T M P O S

Z	V	W	X	Y
E	Q	C	U	R
F	N	A	B	D
L	G	H	I/J	K

C Apply Extended Euclid algorithm to compute GCD (99,78).
Show all the computations.

7M CO1 III

Questions**Marks****CO****BL**

- Q.3 A I** Symmetric key cryptography involves the usage of the _____ key / Keys.
 a) one b) Two c) Three d) None of the above 1M CO2 II
- II** The total number of keys required for a set of n individuals to be able to communicate with each other using secret key and public key cryptosystems, respectively are:
 a) $n(n-1)$ and $2n$
 b) $2n$ and $n(n-1)/2$
 c) $n(n-1)/2$ and $2n$
 d) $n(n-1)/2$ and n 1M CO2 II
- B** Differentiate between stream ciphers and block ciphers. 5M CO2 II
- C** What are the block cipher modes of operation of DES? Explain in detail. 7M CO2 II

OR

- Q.4 A I** DES Algorithm is _____
 a) Block cipher algorithm b) Stream cipher algorithm
 c) Asymmetric algorithm d) None of the above 1M CO2 II
- II** The DES algorithm has a key length of _____
 a) 8 bit b) 32 bit c) 128 bit d) 56 1M CO2 II
- B** Explain Key Calculation Procedure in Simplified DES algorithm. 5M CO2 II
- C** Explain in detail about IDEA algorithm. 7M CO2 II
- Q.5 A I** Identify the value of $\phi(10)$?
 a) 6 b) 4 c) 8 d) 3 1M CO3 III
- II** Extended Euclid's algorithm is used for finding _____
 a) GCD of two numbers b) GCD of more than three numbers
 c) LCM of two numbers d) Both a and c 1M CO3 II
- B** Apply the Chinese Remainder Theorem to solve following congruent equations. $X \equiv 2 \pmod{3}$ $X \equiv 3 \pmod{5}$ $X \equiv 2 \pmod{7}$ 5M CO3 III

OR

- Q.6 A I** A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statement is TRUE?
 a) Sender encrypts using receiver's public key
 b) Sender encrypts using his own public key
 c) Receiver decrypts using sender's public key
 d) Receiver decrypts using own public key 1M CO3 II
- II** Which of the following is not public key Distribution means _____?
 a) Public key certificates b) Hashing Certificates
 c) Publicly available directories d) Public Key authority 1M CO3 II
- B** In public key system using RSA you intercept the cipher text $C = 10$ sent to the user whose public key is $e = 5$, $n = 35$, what is the plaintext M? 5M CO3 III

PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR

Department :CT

Semester: VII

Section: A/B

CAT-I (2023-24)

Subject: Data Visualization

Subject Code: BTCT702T-3

Duration: 1.5 Hrs

Max. Marks: 35

Note:

- 1) All questions are compulsory.
- 2) All questions carry marks as indicated.

Q.No. Questions

Marks CO BL

- | | | | | |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|
| 1 | a. i) _____ statistics describes the characteristics or properties of the data. | 1 | 1 | 1 |
| | a) Descriptive b) Inferential c) Continuous d) Normal | | | |
| | ii) _____ statistics is generally used when the user needs to make a conclusion about the whole population at hand, and this is done using the various types of tests available. | 1 | 1 | 1 |
| | a) Descriptive b) Inferential c) Continuous d) Normal | | | |
| b. | Differentiate between Descriptive and Inferential Statistics. | 5 | 1 | 2 |
| c. | Explain any three data types of the R-object. | 7 | 1 | 2 |

OR

- | | | | | |
|----|----------------------------------------------------------------------------------------------------------|---|---|---|
| 2 | a. i) _____ are tabular data objects. | 1 | 1 | 1 |
| | a) Data frames b) List c) Matrix d) Vector | | | |
| | ii) A _____ in R can store an atomic vector, group of atomic vectors or a combination of many R objects. | 1 | 1 | 1 |
| | a) Variable b) List c) Matrix d) Vector | | | |
| b. | Explain the statement of Hypothesis in detail | 5 | 1 | 2 |
| c. | Explain in short the following term | 7 | 1 | 2 |
| | i) Random Variables ii) Normal Probability Distribution | | | |

- | | | | | |
|----|-----------------------------------------------------------------------------------------------------------------------------|---|---|---|
| 3 | a. i) _____ package is used to arrange data set values on ascending or descending order | 1 | 2 | 1 |
| | a) dplyr b) data.table c) ggplot2 d) readr | | | |
| | ii) _____ provides you with the environment and tools to solve your business problems by collaboratively working with data. | 1 | 2 | 1 |
| | a) Pycharm Studio b) Visual Studio
c) Watson Studio d) all of the mentioned | | | |
| b. | Explain Scatter Plot ? Also explain the advantage and limitation of scatter plot. | 5 | 2 | 2 |
| c. | What is dataframe and how it is created in R ? | 7 | 2 | 2 |

OR

- | | | | | |
|---|----------------------------------------------------------------------------------|---|---|---|
| 4 | a. i) _____ helps in reading various forms of data into R with 10x faster speed. | 1 | 2 | 1 |
| | a) dplyr b) data.table c) ggplot2 d) readr | | | |

b.	_____ package reduces the pain of working of data time variable in R.	1	2	1
	a) dplyr b) Lubridate c) reshape2 d) readr			
b.	Explain Bar plot in detail.	5	2	2
c.	Explain Box and Histogram plot with advantages and limitation.	7	2	2
5	a. i) What will be the output of the following Python code?	1	3	1
	x = 'abcd' for i in range(len(x)): print(i)			
	a) error b) 1 2 3 4 c) a b c d d) 0 1 2 3			
	ii) What will be the output of the following code snippet?	1	3	1
	print(type(5 / 2)) print(type(5 // 2))			
	a) float and int b) int and float c) float and float d) int and int			
	✓ a) float and int			
b.	What are the features and applications of Python?	5	3	2
	OR			
6	a. i) Which type of Programming does Python support?	1	3	1
	a) object-oriented programming b) structured programming			
	c) functional programming d) all of the mentioned			
	ii) Which of the following is not a core data type in Python programming?			1
	a) Tuples b) Lists c) Class d) Dictionary			
b.	What is dictionary? Explain the methods available in dictionary.	5	3	2

PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR
CAT- 1 (2023-2024)

Department :- Computer Technology
Subject :- Human Computer Interface
Duration : 1.5 Hrs

Semester :- VII 'A/B'
Subject Code :- BTCT702T
Max Marks :- 35

Note: 1) All Questions are Compulsory
 2) All Questions Carry Marks as Indicated

Q. No.	Questions	Marks	CO	BL
Q 1. I.	What is a semantic network?			
A)	A. A model of short-term memory B. A model of long-term memory C. A model of physical memory D. A model of short and long-term memory	1 M	CO1	I
II.	For a product to be successful, it must be: A. Useful by humans B. Usable by humans C. Used by humans D. All of the above	1 M		I
B)	Explain in detail about Reasoning and problem solving?	5 M		II
C)	Describe five important differences between Short Term Memory and Long-Term Memory	7 M		II
OR				
Q 2. I.	What are the major input senses?			
A)	A. Sight,Hearing B. Touch C. Taste,Smell D. All the above	1 M	CO1	I
II.	A sensory memory exists for _____ channel A. haptic B. Visual C. iconic D. All of the above	1 M		I
B)	Define interaction. Explain the Models – frameworks of it?	5 M		I
C)	Briefly discuss about the types of memory in detail.	7 M		II
Q 3. I.	Which of the following are important in the design focus of HCI?			
A)	A. Thinking of the user B. Testing the HCI C. Involving the users D. All of the above	1 M	CO2	I
II.	What are the steps involved in designing A. Communication B. Validation of models C. Time constraints D. All of the above	1 M		I
B)	Explain in detail about process of design with suitable examples.	5 M		II
C)	Briefly discuss about the three main approaches to prototyping.	7 M		II

OR

Q 4. I. Design involves	1 M	CO2	I
A) A. achieving goals within constraints and trade-off between these B. understanding the raw materials: computer and human C. accepting limitations of humans and of design D. All of the above			
II. There are _____ Normans principles	1 M		I
A. 6 B. 7 C. 8 D. 9			
B) Explain the software life cycle process in a HCI software process.	5 M		II
C) With a neat sketch, describe about Interaction design process and golden rule of Design.	7 M		I
Q 5. I. Cognitive model represents	1 M	CO3	I
A) A. interactive user B. Design of a model C. Screen D. None of the above			
II. Who are stakeholders?	1 M		I
A. users in potential interest B. users are affected by success or failure of a system C. None of the above D. All of the above			
B) What is meant by GOMS? give an example.	2 M		I
C) Describe cognitive model and its techniques.	3 M		II
OR			
Q 6. I. Difference between goal and task?	1-M	CO3	II
A) A. goals – intentions what you would like to be true and internal, tasks – actions how to achieve it, actions external B. goals – intentions what you would like to be true and external, tasks – actions how to achieve it, actions external C. goals – intentions what you would like to be true and external, tasks – actions how to achieve it, actions internal D. None of the above			
II. What is GOMS?	1 M		I
A. Goals B. operator C. methods D. selections E. All of the above			
B) What are the organizational issues present in socio organization?	2 M		I
C) Explain in detail about goal and task hierarchies.	3 M		II

SEMESTER: B.Tech.VII

DATE : 04/09/2023

SUBJECT: Python Programming

SUBJECT CODE: BTECH_AI&DS-604T

DURATION: 1 Hr 30 Min

MAX MARKS: 35

Note:

- 1) All questions are Compulsory.
- 2) All questions carry marks as indicated.
- 3) Assume suitable data whenever necessary.

Que. No.	Question	Marks	CO	BL
Que 1. A	I. _____ keyword is used for function in Python language. a) Function b) def c) Fun d) Define II. Python supports the creation of anonymous functions at runtime, using a construct called a) pi b) Anonymus c) lamda d) none	1 1	CO1 CO1	1 1
B	Explain in brief diffrent types of Operators in Python.	5	CO1	2
C	Which are the build in data-types in python and how we can declare them in the program	7	CO1	2
OR				
Que 2. A	I. _____ is the built-in function in python. a) sqrt() b) scan() c) speed() d) print() II. Which of the following is the truncation division operator in Python? a) b) / c) // d) %	1 1	CO1 CO1	1 1
B	Difffrentiate between Python Module and Python Functions	5	CO1	2
C	Write a Program to find area and circumference of circle by giving the radius as input from user end	7	CO1	3

Que 3. A	I. What will be the output of the following Python code? <pre>x = 'abcd' for i in x: print(i.upper())</pre> <p>a) error b) abcd c) AbCd d) ABCD</p>	1	CO1	
	II. Which of the following operators cannot be used with strings in Python? <p>a) + b) / c) - d) All of the above</p>	1	CO1	1
	B Diffrentiate between Method Overloading and Method Overriding. C Write a Python Program using Function to calculate the factorial of a number	5	CO1	2
	OR			
Que 4. A	I. What will be the output of the following Python code? <pre>class test: def __init__(self,a): self.a=a def display(self): print(self.a) obj=test() obj.display()</pre> <p>a) Runs normally, doesn't display anything b) Displays 0, which is the automatic default value c) Error as one argument is required while creating the object d) Error as display function requires additional argument</p> <p>II. What is Instantiation in terms of OOP terminology? <p>a) Deleting an instance of class b) Modifying an instance of class c) Copying an instance of class d) Creating an instance of class</p> </p>	1	CO2	1
B	What is mean by inheritance and explain different types of inheritance.	5	CO2	2
C	Write a Python program to create a calculator class. Include methods for basic arithmetic operations.	7	CO2	

Que 5.	A	I. Pandas deals with which of the following data structure a) series b) data frames c) panel d) all of the above	1	CO3	1
		II. pandas is the library that deals with a) data sets b) arrays c) none of the above d) both a and b			
B		What are the attributes of pandas series, explain with examples.	5	CO3	2
		OR			
Que 6.	A	I. The most important object defined in NumPy is an N-dimensional array type called? a) ndarray b) narray c) nd_array d) darray	1	CO3	1
		II. Which of the following Numpy operation are correct? a) Mathematical and logical operations on arrays. b) Fourier transforms and routines for shape manipulation. c) Operations related to linear algebra. d) All of the above	1	CO3	1
B		Explain in detail what are the operations to be performed on arrays using numpy library.	5	CO3	2