

Total No. of Questions : 5]

PA-1023

SEAT No. :

[Total No. of Pages : 2

[5902]-51

T.Y. B.Sc. (Computer Science)
CS-351 : OPERATING SYSTEMS-I
(CBCS) (2019 Pattern) (Semester - V) (Paper - I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use suitable data if necessary.*

Q1) Attempt any Eight of the following :

[8 × 1 = 8]

- a) What is a shell?
- b) Define the I/O Bound process.
- c) Define the term semaphore.
- d) What is a thread library?
- e) What is synchronisation?
- f) What is physical address space?
- g) What is context switching?
- h) What is page?
- i) Define the term dispatcher?
- j) What is booting?

Q2) Attempt Any Four of the following :

[4 × 2 = 8]

- a) Write advantages of distributed operating systems.
- b) Compare preemptive and non preemptive scheduling?
- c) List out functions of memory management.

P.T.O.

- d) List the types of schedulers and also explain short term schedulers in detail.
- e) Define independent and dependent processes.

Q3) Attempt Any Two of the following :

[2 × 4 = 8]

- a) Explain multi threading model in detail.
- b) Which three requirements must be satisfied while designing a solutions to the critical section problem? Explain in detail.
- c) Consider the following set of processes with the length of cpu burst time and arrival time in milliseconds.

processes	B.T	A.T
p1	5	1.5
p2	1	0
p3	2	2
p4	4	3

Compute total waiting time and turnaround time using preemptive SJF scheduling algorithm

Q4) Attempt Any Two of the following :

[2 × 4 = 8]

- a) Describe PCB with all its fields.
- b) Explain bounded buffer problem in detail.
- c) Consider the following reference string and find out the total number of page faults using OPT and FIFO. Assume no of frames are 3
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3

Q5) Attempt Any One of the following :

[1 × 3 = 3]

- a) Differentiate between client server and peer to peer computing environments
- b) Describe segmentation in detail.



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SEAT No. :

PA-1024

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[5902]-52

T.Y. B.Sc (Computer Science)
COMPUTER NETWORKS - II
(2019 Pattern) (Semester - V) (CS-352)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Attempt all questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*

Q1) Attempt any EIGHT of the following (out of TEN)

[8 × 1 = 8]

- a) What is Primary Server?
- b) Write services provide by user agents, and explain composing message?
- c) Define Jitter and Translation.
- d) What is sampling?
- e) Define cryptanalysis.
- f) What is S-box component of a modern block cipher?
- g) Write name of steps perform in each round of DES (Data Encryption Standard) Cipher.
- h) What is the purpose of IPSec?
- i) Write name of protocols on which IKE (Internet Key Exchange) is based.
- j) A proxy firewall is also called application gateway. Write true or false and also justify.

P.T.O.

Q2) Attempt any FOUR of the following (out of FIVE)

[4 × 2 = 8]

- a) What is firewall? Explain with diagram.
- b) What is streaming audio/video? Also write examples.
- c) Write information about iterative resolution, with diagram.
- d) What is anonymous FTP?
- e) What is Digital Signature?

Q3) Attempt any TWO of the following (out of THREE)

[2 × 4 = 8]

- a) Explain security services for message.
- b) Explain streaming stored audio/video Third Approach: Using a media server.
- c) Explain any four user agent services.

Q4) Attempt any TWO of the following (out of THREE)

[2 × 4 = 8]

- a) What is IMAP4? Write it's features, advantages and disadvantages.
- b) Explain asymmetric key cryptography with the help of diagram.
- c) Explain in detail packet filter firewall, also write it's advantages and disadvantages.

Q5) Attempt any ONE of the following (out of TWO)

[1 × 3 = 3]

- a) Using columnar transposition cipher, convert following plaintext to ciphertext. 'allthepacketsfromporttenareallowed', key="COMPUTER"
- b) Write note on Real-Time Transport protocol (RTP).



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SEAT No. :

PA-1025

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T.Y. B.Sc (Computer Science)

WEB TECHNOLOGIES - I

(2019 Pattern) (Semester - V) (CS-353)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.

Q1) Attempt any Eight of the following (out of Ten)

[8 × 1 = 8]

- a) Which tag is used to set the text in Superscript format?
- b) Explain the use of <Style>
- c) What is difference between echo () and print () function?
- d) Which construct is used to define an array?
- e) How to create a directory in PHP?
- f) Explain any two directory functions.
- g) What is a DSN?
- h) Which protocols are used to retrieve mail from server?
- i) How to convert an object to array?
- j) Explain SMTP Protocol.

Q2) Attempt any FOUR of the following (out of Five)

[4 × 2 = 8]

- a) Differentiate between single quoted string and double quoted string.
- b) How External CSS is used?
- c) Write any two functions of decompose string with suitable example.
- d) How to find out the position of the first occurrence of a substring in a string?
- e) What is the purpose of array_splice () function?

P.T.O.

Q3) Attempt any TWO of the following (out of Three) [2 × 4 = 8]

- a) Discuss the Scope of a Variable in PHP with an example
- b) Explain prepare () and execute () command in database handling
- c) Explain the functions used for reading and writing characters in files.

Q4) Attempt any TWO of the following (out of Three) [2 × 4 = 8]

- a) Design HTML form that will accept user input of user name, Address, provide buttons to submit the input as well as to refresh it.
- b) Write PHP Script to accept associative array and sort in descending order. Display sorted array to user.
- c) Accept directory name from user. Write PHP program to change current directory to accepted directory name and count number of files and directories in it.

Q5) Attempt any ONE of the following (out of Two) [1 × 3 = 3]

- a) Explain terms HTTP request and HTTP response.
- b) Explain the concept of missing parameters to a function with suitable example.



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SEAT No. :

PA-1026

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[5902]-54

T.Y. BSc.

COMPUTER SCIENCE

CS - 354 ; Foundation of Datascience

(2019 Pattern) (CBCS) (Semester - V)

Time : 2 Hours]

Max. Marks : 35

Instructions to the candidates:

- 1) Figures to the right indicate full marks.
- 2) All questions are compulsory.
- 3) Neat labelled diagrams must be drawn wherever necessary.

Q1) Attempt any EIGHT of the following.

[8×1=8]

- a) What is Data science?
- b) Define Data source?
- c) What is missing values?
- d) List the visualization libraries in python.
- e) List applications of data science.
- f) What is data transformation?
- g) Define Hypothesis Testing?
- h) What is use of Bubble plot?
- i) Define Data cleaning?
- j) Define standard deviation?

Q2) Attempt any FOUR of the following.

[4×2=8]

- a) List the tools for data scientist.
- b) Define statistical data analysis?

P.T.O.

- c) What is data cube?
- d) Give the purpose of data preprocessing?
- e) What is the purpose of data visualization?

Q3) Attempt any two of the following. [2×4=8]

- a) What are the measures of central tendency? Explain any two of them in brief.
- b) What are the various types of data available? Give example of each?
- c) What is venn diagram? How to create it? Explain with example.

Q4) Attempt any two of the following. [2×4=8]

- a) Explain different data formats in brief.
- b) What is data quality? Which factors are affected data qualities?
- c) Write details notes on basic data visualization tools?

Q5) Attempt any ONE of the following. [1×3=3]

- a) What is outlier? State types of outliers.
- b) State and explain any three data transformation techniques.



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SEAT No. :

PA-1027

[Total No. of Pages : 3

[5902]-55

T.Y. B.Sc. (Computer Science)

CS - 355 : OBJECT ORIENTED PROGRAMMING USING
JAVA - I

(2019 Pattern) (Semester - V)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.

Q1) Attempt any EIGHT of the following : (out of ten)

[8 × 1 = 8]

- a) What is use of Javac?
- b) Give the name of any two wrapper classes.
- c) What is use of 'implements' keyword?
- d) List types of constructor.
- e) What is use of Array?
- f) Give the name of any two listeners.
- g) What is exception?
- h) Give the syntax of ends with() method?
- i) What is package?
- j) What is use of new operator?

Q2) Attempt any FOUR of the following. (Out of Five)

[4 × 2 = 8]

- a) 'When constructor of class will be called?' Comment.
- b) What is command line argument? Where they are stored in a program.

P.T.O.

- c) What is Frame? Give its any two methods.
- d) Differentiate between method overloading and method overriding.
- e) Write any two access specifiers.

Q3) Attempt any two of the following. (Out of Three) [2 × 4 = 8]

- a) Define an interface shape with abstract method area(). Inherit interface shape into the class traingle. Write a Java Program to calculate area of Triangle.
- b) Design the following screen by using swing.

Write a Java program to accept the details of student & display an console by clicking on Display button. Clear button should clear all the controls.

- c) Write a Java Program to copy the contents form one file into another file. While copying, change the case of cell the alphabets & replace all the digital by '*'.

Q4) Attempt any two of the following. (out of Three) [2 × 4 = 8]

- a) Differentiate between AWT & Swing.
- b) Define user define exception zeronumber Exc. Write a Java program to accept a number from user. If it is zero then throw user define exception "Number is zero" otherwise calculate the sum of first & last digit of given number. (use Static Keyword).
- c) Write a Java program to accept n number from user & store only perfect numbers into array & display that array.

Q5) Attempt any ONE of the following. (out of Two)

[1×3=3]

- a) Explain uses of final keyword with example.
- b) Define a class Emp with a member Eid and display() method, inherit Emp class into the Emp Name class, Emp Name class having a member Ename & display () method. Write a Java program to accept details of employee [Eid, Ename] & display it. (Use super keyword).



Total No. of Questions : 5]

SEAT No. :

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PA-1028

[5902]-56

T.Y. B.Sc. (Semester - V)

COMPUTER SCIENCE

CS-356 : Theoretical Computer Science
(2019 Pattern) (CBCS)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.

Q1) Attempt any EIGHT of the following (Out of TEN). [8 × 1 = 8]

- a) Define Unit production of grammar.
- b) Construct Melay machine which toggles its input.
- c) Explain proper Suffix and Prefix of a string with one example.
- d) Give formal definition of Push down Automata.
- e) Define left linear and right linear grammar.
- f) State True or False Finite Automata has an infinite number of states.
- g) Name the types of normal forms of grammar.
- h) Write the tuples of LBA.
- i) State true or false. Pumping lemma is used to show that language is not context tree.
- j) Write smallest possible string accepted by the following regular expression.

$10 + (0 + 11)0^*1$

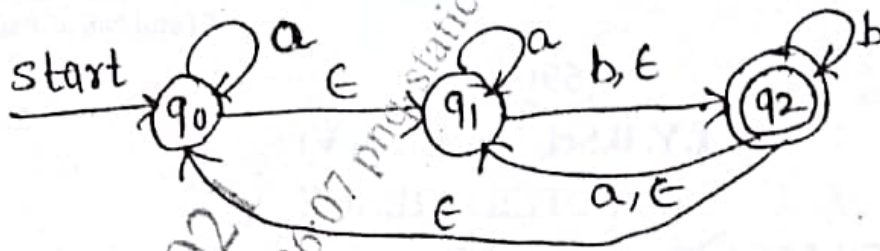
Q2) Attempt any FOUR of the following (Out of FIVE). [4 × 2 = 8]

- a) Explain types of grammar.
- b) Construct FA for regular expression.
 $(01+10)^*+11$
- c) Differentiate between FA and PDA (any two points).

Chomsky
Grai bach

P.T.O.

- d) Write down the ϵ -closure of each state from the following FA.



- e) Define types of Turing Machine.

Q3) Attempt any TWO of the following (Out of THREE).

[2 × 4 = 8]

- a) Construct a DFA for a language

$L_1 \cap L_2$

$L_1 = \{ \text{All strings starting with 'a'} \}$

$L_2 = \{ \text{All strings not having 'ab' as substring} \}$

- b) Construct the following CFG into Normal Form (CNF)

$S \rightarrow ABA$

$A \rightarrow aA \mid \epsilon$

$B \rightarrow bB \mid \epsilon$

- c) Design TM for language

$L = \{ WCW^R \mid W \text{ is in } (0^*1^*)^* \}$

Q4) Attempt any TWO of the following (Out of THREE).

[2 × 4 = 8]

- a) Construct a PDA for the language

$L = \{ 0^n 1^m 2^{n+m} \mid n, m \geq 1 \}$

- b) Construct a Moore machine for the language L over $\Sigma = \{0, 1\}$ which outputs '*' if the string contains '11' in it and outputs '#' otherwise.

- c) Compare DFA and NFA.

Q5) Attempt any ONE of the following (Out of TWO).

[1 × 3 = 3]

- a) Construct a Mealy machine to convert each occurrence of substring 101 by 100 over alphabet $\{0, 1\}$.

- b) Show that $L = \{0^n 1^n \mid n \geq 1\}$ is not regular.

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Total No. of Questions : 5]

SEAT No. : 5149

PA-1029

[Total No. of Pages : 3

[5902]-57

T.Y. B.Sc. (Semester - V)

COMPUTER SCIENCE

CS-3510 : Python Programming  
(2019 Pattern) (CBCS)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Figures to the right indicate full marks.
- 2) All Questions are compulsory.
- 3) Total number of questions are FIVE.

Q1) Attempt any Eight of the following (Out of Ten).

[8 × 1 = 8]

- a) What are the advantages of Python?
- b) List out main differences between lists & tuple.
- c) Python is a scripting language. Comment.
- d) Demonstrate set with example.
- e) What is dictionary? Give example.
- f) What is regEx? give example.
- g) What is user defined Module? Give example.
- h) Python is case sensitive language. Comment.
- i) What is dry run in Python?
- j) What is lambda function? Give example.

Q2) Attempt any four of the following (Out of Five).

[4 × 2 = 8]

- a) Write a python program to calculate  $X^Y$ .
- b) Write a python program to accept a number and check whether it is perfect number or not.

P.T.O.

- c) What is the use of seek( ) & tell ( ) functions?
- d) Demonstrate list slicing.
- e) A tuple is ordered collection of items. Comment.

**Q3) Attempt any Two of the following (Out of Three). [2 × 4 = 8]**

- a) Write a short note on datatypes in Python.
- b) Write a short note on exception handling.
- c) What is a module? What is package? Explain with example.

**Q4) Attempt any Two of the following (Out of Three). [2 × 4 = 8]**

- a) Write a recursive function in Python to display addition of digits in single digit.
- b) Write a program in python to accept 'n' integers in a list, compute & display addition of all squares of these integers.
- c) Write a Python program to count all occurrences of "India" and "Country" in a text file "pledge.txt".

**Q5) Attempt any One of the following (Out of Two). [1 × 3 = 3]**

- a) What is the output of following code :

```
X = 5
def f1():
    global X
    X = 4
def f2(a, b):
    global X
    return a+b+X
f1()
total = f2(1, 2)
print (total)
```

b) What is the output of following code:

```
def f(X):  
    def f1(a, b):  
        print("hello")  
        if (b==0):  
            print("NO")  
        return  
        return f(a, b)  
    return f1  
@ f  
def f(a, b):  
    return a%b  
f(4, 0)
```



Total No. of Questions : 5]

SEAT No. :

PA-1030

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[5902]-58

**T.Y. B.Sc. (Semester - V)**  
**COMPUTER SCIENCE**  
**CS-3511 : Blockchain Technology**  
**(2019 Pattern) (CBCS)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1) Attempt any eight of the following :**

**[8 × 1 = 8]**

- a) What is the formula to calculate transaction fee in Ethereum?
- b) What is plain text and cipher text?
- c) What is FPGA?
- d) In AES, on which factor does the number of encryption rounds depend on?
- e) What is smart contract?
- f) What is the size of encryption key in DES?
- g) What is ASIC?
- h) Which algorithm is used by Bitcoin to verify transactions?
- i) Which is a unique PoS cryptocurrency that is aimed at delivering interoperability among other blockchains?
- j) What is DAPP?

**P.T.O.**

Q2) Attempt any four of the following :

[4 × 2 = 8]

- What is the difference between public and private blockchains?
- Blockchains are slow as compare to database. Justify.
- What is P2P crypto Exchange?
- What is BFT?
- What is Hybrid Blockchain?

Q3) Attempt any two of the following :

[2 × 4 = 8]

- Write a short note on life cycle of smart contract.
- What is Hard & Soft forks?
- What is PoW?

Q4) Attempt any two of the following :

[2 × 4 = 8]

- Write a short note on challenges of blockchain.
- Write a short note on ICO.
- Which are the different value data types in solidity?

Q5) Attempt any one of the following :

[1 × 3 = 3]

- Write a short note on first Generation Blockchain.
- Describe EVM with the help of neat diagram.

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