Total No. of Questions : 5]

SEAT No. :

PA-1023

[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 inddicate 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 schedulars and also explain short term schedulars in detail.

e) Define independent and dependent processes.

Q3) **Attempt <u>Any Two</u> 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 <u>Any Two</u> 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 <u>Any One</u> of the following :** **[1 × 3 = 3]**

a) Differentiate between client server and peer to peer computing environments

b) Describe segmentation in detail.

Total No. of Questions : 5]

SEAT No. : ____

PA-1024

[Total No. of Pages : 2

[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) ***Figurers 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 PrimaryServer?

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 plaintextto ciphertext. 'allthepacketsfromporttenareallowed", key="COMPUTER"

b) Write note on Real-Time Transport protocol (RTP).

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Total No. of Questions : 5]

SEAT No. : ____

PA-1025

[Total No. of Pages : 2

[5902]-53
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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Total No. of Questions : 5]

SEAT No. :

PA-1026

[Total No. of Pages : 2

[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.

Total No. of Questions : 5]

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.

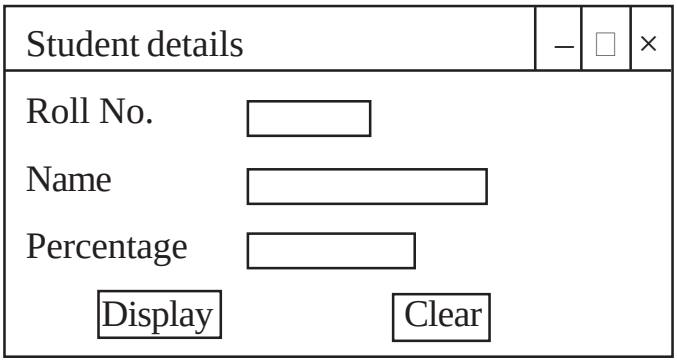
d) Differentiate between method overloading and method overriding.

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. : ____

PA-1028

[Total No. of Pages : 2

[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.

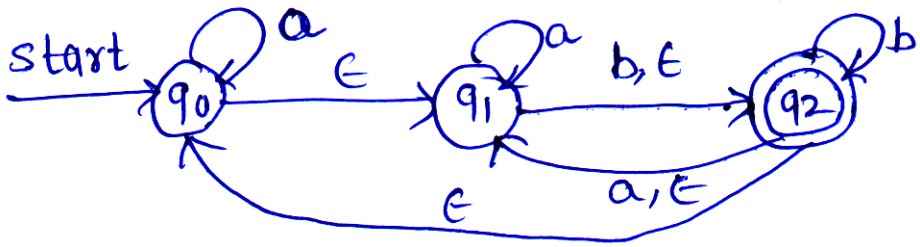
b) Construct FA for regular expression.

(01+10)*+11

c) Differentiate between FA and PDA (any two points).

P.T.O.

d) Write down the $\in$-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

L1∩L2

L1= { All strings starting with 'a'}

L2= { All strings not having 'ab' as substring}

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

S-> ABA

A-> aA | $\in$

B-> bB | $\in$

c) Design TM for language,

L $\{WCW^R|W$ is in $(0+1)^*\}$

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

a) Construct a PDA for the language

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

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 $L = \{0^n1^n \mid n>=1\}$ is not regular.

Total No. of Questions : 5]

SEAT No. :

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 occurences 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

[Total No. of Pages : 2

[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]**

a) What is the difference between public and private blockchains?

b) Blockchains are slow as compare to database. Justify.

c) What is P2P crypto Exchange?

d) What is BFT?

e) What is Hybrid Blockchain?

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

a) Write a short note on life cycle of smart contract.

b) What is Hard & Soft forks?

c) What is PoW?

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

a) Write a short note on challenges of blockchain.

b) Write a short note on ICO.

c) Which are the different value data types in solidity?

Q5) Attempt any one of the following : **[1 × 3 = 3]**

a) Write a short note on first Generation Blockchain.

b) Describe EVM with the help of neat diagram.

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Total No. of Questions : 5]

SEAT No. : ____

PA-1031

[Total No. of Pages : 3

[5902]-61

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

COMPUTER SCIENCE

CS-361 : Operating System - II

(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 request edge?

b) What is safe state?

c) Write the names of any two disk allocation methods of disk space.

d) List disk performance parameters.

e) Define distributed system.

f) What is size scalability?

g) List the different architectural styles of distributed operating systems.

h) What is kernel?

i) What is RISC in ARM architecture?

j) Write any two special service requirements of mobile operating system.

P.T.O.

Q2) **Attempt any four of the following :** **[4 × 2 = 8]**

a) Write the difference between SCAN & LOOk disk scheduling algorithms.

b) Define seek time & rotational latency.

c) Explain features of mobile operating system.

d) Give a comparative study of any four points of Android mobile operating system and Apple i05 mobile operating system.

e) Write a short note on centralized organization of system architecture.

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

a) Explain any two deadlock prevention strategies.

b) Explain sequential access & Direct access methods for a file.

c) Write a short note on cloud computing system.

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

a) Consider following snapshot of the system. A, B, C, D are the resource types. Answer the following questions using Banker's algorithm.

i) What are the contents of Need matrix/array?

ii) If the system is in the safe state, give the safe sequence.

	Allocation				Max				Total			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

b) Explain any four file operations.

c) Explain the design goals of distributed systems.

Q5) **Attempt any one of the following :** **[1 × 3 = 3]**

a) What is total head movement for First-Come First-Served (FCFS) scheduling for the disk queue with requests for I/O to blocks on cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order, If the disk head is initially at cylinder 53.

b) Explain the special constraints & requirements of mobile operating system.

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Total No. of Questions : 5]

SEAT No. : ____

PA-1032

[Total No. of Pages : 2

[5902]-62
T.Y. B.Sc. (Computer Science)
CS - 362 : SOFTWARE TESTING
(2019 Pattern) (Semester - VI) (CBCS)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

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

Q1) Attempt any 8 of the following : **[8 × 1 = 8]**

a) What is fault?

b) Define verification.

c) Define stub.

d) Write methods of white box testing.

e) Define regression testing.

f) What is Agile Methodology?

g) List dimensions of quality

h) Define strategy for web applications.

i) Define acceptance testing.

j) Black box testing is called glass box testing Justify T/F.

Q2) Attempt any four of the following : **[4 × 2 = 8]**

a) Write short note on testing roles.

b) Explain white box and black box testing.

c) Compare testing and debugging any two points.

d) Explain performance of testing.

e) Write a short note on features of Agile testing.

P.T.O.

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

a) Explain test case with example.

b) Write a short note on V-model with diagram.

c) Explain navigation testing in detail.

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

a) Write a short note on alpha & beta testing.

b) Explain integration testing. What is bottom up integration.

c) What is web application? How it works explain with diagram.

Q5) Attempt any one of the following : **[1 × 3 = 3]**

a) Explain different layers of automated tests.

b) Write a short note on internationailization testing.

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Total No. of Questions : 5]

SEAT No. :

PA-1033

[Total No. of Pages : 3

[5902]-63
T.Y. B.Sc. (Computer Science)
CS - 363 : WEB TECHNOLOGIES - II
(2019 Pattern) (Semester - VI) (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) How to set response header in PHP?

b) Write any two applications of using AJAX.

c) What are XML namespaces?

d) Write the elements of global array $_SERVER.

e) Give any two limitations of JavaScript.

f) Whether root element is required for XML file? If so, how many root elements are required?

g) What is the use of iSNAN() function in Java Script?

h) What are different values of readyState property of XMLHttpRequest?

i) List out parts of XML document structure.

j) Which function is used to create cookie in PHP? Give syntax of it.

Q2) **Attempt any FOUR of the following :** **[4 × 2 = 8]**

a) List any four datatypes that JavaScript support with its usage.

b) How to start and destroy session in PHP? Give syntax.

c) Draw AJAX web application model.

d) What is MVC?

e) What are different rules to make XML document well-formed?

P.T.O.

Q3) **Attempt any TWO of the following :** **[2 × 4 = 8]**

a) Explain the JavaScript confirm dialog box with suitable example.

b) Explain CodeIgniter architecture with suitable diagram.

c) What are different techniques to maintain state in PHP?

Q4) **Attempt any TWO of the following :** **[2 × 4 = 8]**

a) Write an AJAX program to display list of countries stored in an array on clicking OK button.

b) Design the HTML form to accept Employee name, Age and Mobile no. and perform the following validation using Java Script:

i) No field should be empty.

ii) Mobile no. must contain 10 digits

c) Suppose following books.xml is loaded into xmlDoc. Get the first <book> element and change the "category" attribute value to “food” using XML DOM.

```
<?xml version="1.0" encoding="UTF-8"?>

<bookstore>

    <book category="cooking">

    <title lang="en">Everyday Italian</title>

    <author>Giada De Laurentiis</author>

    <year>2005</year>

    <price>30.00</price>

    <book>

</bookstore>
```

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

a) What is XML parser? Explain two different types of XML parsers.

b) Write down the steps to integrate external CSS and JS file in CodeIgniter. Give example.

□□□

Total No. of Questions : 5]

SEAT No. :

PA-1034

[Total No. of Pages : 2

[5902]-64

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

COMPUTER SCIENCE

CS-364 : Data Analytics

(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 10). **[8 × 1 = 8]**

a) Define Data Analytics.

b) What is AVC & ROC curve?

c) Write any two applications of Supervised Machine Learning.

d) Give the formula for support & confidence.

e) What is an outlier?

f) State applications of NLP.

g) What is web scraping?

h) What is the purpose of n-gram?

i) Define classification.

j) Define Recall.

Q2) Attempt any four of the following (Out of five). **[4 × 2 = 8]**

a) Explain the concept of underfitting & overfitting.

b) What is linear Regression? What type of Machine learning applications can be solved with linear Regression?

P.T.O.

c) What is Social Media Analytics?

d) What are the advantages of FP-growth Algorithm?

e) What are dependent & independent variables?

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

a) What are frequent itemsets & association rules? Describe with example.

b) What is stemming & lemmatization?

c) Explain various types of Data Analytics.

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

a) What is Bag of words & DOS tagging in NLP?

b) What is Logistic Regression? Explain it with example.

c) Consider the following database & find out the frequent itemset using Apriori Algorithm with minimum support threshold = 3.

T. id.	Item purchased
1	M,T,B
2	E,T,C
3	M,E,T,C
4	E,C
5	J

Q5) Attempt any one of the following (Out of 2). **[1 × 3 = 3]**

a) Define the terms

i) Confusion Matrix

ii) Accuracy

iii) Precision

b) What is Machine Learning? Explain its type.

Total No. of Questions : 5]

SEAT No. : ____

PA-1035

[Total No. of Pages : 2

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

COMPUTER SCIENCE (Paper - V)

CS-365 : Object Oriented Programming using Java - II

(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 collection?

b) Define Thread Priority.

c) What is jdbc?

d) Define Session.

e) What is use of request object?

f) Write any one application of spring.

g) What is use of join( ) method?

h) Define HashTable.

i) What is use of commit( ) method?

j) List any two implicit object in JSP.

Q2) Attempt any four of the following. **[4 × 2 = 8]**

a) Write any two differences between Array List and Linked List.

b) Give any two field of Resultset Interface.

c) Give any two types of servlet.

P.T.O.

d) Differentiate between sleep( ) and interrupt( ).

e) Write a syntax of getcookies( ) method in servlet.

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

a) Write a jdbc program to accept details of student (RN, Name, percentage) from user. Display that details.

b) Write a java program in multithreading to display all the numbers between 1 to 10. Each number should display after 2 seconds.

c) Write a jsp script to check the given number is prime or not. Display the result in blue color.

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

a) Write a Servlet program to get information about the server such as name, port number and version of server.

b) Explain JSP lifecycle in details.

c) Explain Synchronization with an example.

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

a) Explain execution process of servlet application.

b) Write a java program to accept 'n' names from user store them into Array List, sort them in ascending order and display it.

Total No. of Questions : 5]

SEAT No. :

PA-1036

[Total No. of Pages : 3

[5902]-66

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

COMPUTER SCIENCE

CS-366 : Compiler Construction

(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) YACC is a compiler or Parser. Write Correct Statement.

b) Write a regular expression in lex for hex decimal number in C language.

c) Define cross Compiler.

d) List any two transformations performed on basic block.

e) What is sentinels?

f) Define Annotated Parse Tree.

g) Name the types of LR parser.

h) What is basic block?

i) State the use of function retract ( ).

j) Construct LR(1) items for the following production.

$S \rightarrow \in$

Q2) Attempt any four of the following : **[4 × 2 = 8]**

a) List out all phases of compiler in sequence.

b) Define synthesized attribute and Inherited attribute.

P.T.O.

c) Construct a DAG for block :

b = a[i]

a[j] = d

e = a[i]

d) Differentiate between top-down parsing and bottom-up parsing.

e) Define left recursion. How it can be eliminated?

Q3) Attempt any two of the following (out of three) : **[2 × 4 = 8]**

a) Check whether the given grammar is SLR (1) or not.

$S \rightarrow L = R \mid R$

$L \rightarrow * R \mid id$

$R \rightarrow L$

b) Write lex program specification. Explain the Lex library functions associated with lex in brief.

c) Compute First & Follow for the following.

$S \rightarrow BD \mid AB$

$A \rightarrow aAa|b$

$B \rightarrow bAa \mid \in$

$D \rightarrow \in$

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

a) Check whether the give grammar is LALR (1) or not.

$S \rightarrow aAd \mid bBd \mid aBe \mid bAe$

$A \rightarrow c$

$B \rightarrow c$

b) What is multi-pass compiler? Explain diagrammatically with its advantages and disadvantages.

c) Consider the following syntax-directed definition and Draw the Annotated parse tree for the input string 5+3*4.

Production	Semantic Rule
L → En	Print E.val
E → E1+T	E.val=El.val+T.val
E → T	E.val=T.val
T → Tl * F	T.val=TI.val* F.val
T → F	T.val=F.val
F → (E)	F.val=E.val
F → digit	F.val=digit.lexval

Q5) Attempt any one of the following : **[1 × 3 = 3]**

a) List the code optimization techniques. Explain anyone technique with an example.

b) Draw the operator precedence table for the following grammar :

E → E + E |E*E |E-E |id

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Total No. of Questions : 5]

SEAT No. : ____

PA-1037

[Total No. of Pages : 2

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T.Y. B.Sc. (Computer Science) (Semester - VI)

CS-3610 : Software Testing and Tools (Paper - VII)

(2019 Pattern)

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 Test Automation.

b) What is test report?

c) What is static testing?

d) What is error?

e) Write any two software defect by nature.

f) Define Smoke testing.

g) Test suites are used to group similar test cases. State TRUE or FALSE.

h) What is Cyclomatic complexity?

i) How many types of testing tools?

j) Define code coverage in white box testing.

Q2) Attempt any four of the following (out of five) : **[4 × 2 = 8]**

a) List the goals of loop coverage testing.

b) Define test criteria and explain its types.

c) List any two web based open source automation software testing tools.

d) Define priority defect and its different levels.

e) Write any two features of Bugzilla tool.

P.T.O.

Q3) Attempt any two of the following (out of three) : **[2 × 4 = 8]**

a) What are different types of loop testing? Explain in details.

b) Explain IEEE Std.Test Incident report in details.

c) Develop source code to check if number is prime or not in C Programming lang.

i) Draw the control flow graph.

ii) Calculate Cyclomatic complexity for all methods.

iii) List all independent path test cases for independent paths.

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

a) Create case study for verify the functionality of amazon login page.

b) Consider following code and apply decision coverage testing create use cases

```
Check-class(int x)
    {
        If(x>80)
            Print("O")
        else
            Print("Class A")
    }
```

Test case 1: x >80 and Test case 2: x <80

c) Explain STLC with its phases.

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

a) Write short note on Classification of Defects.

b) Give any three features of winRunner and selenium.

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Total No. of Questions : 4]

SEAT No. : ____

PA-3469

[Total No. of Pages : 3

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

CS - 212 : RELATIONAL DATABASE MANAGEMENT SYSTEMS

(2013 Pattern) (Semester - I) (Paper - II) (21122)

Time : 2 Hours] ***[Max. Marks : 40***

Instructions to the candidates :

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

Q1) Attempt all of the following : **[10 × 1 = 10]**

a) What are the undesirable properties of a Bad database design?

b) Define Decomposition.

c) What is System Throughput?

d) Define Deadlock.

e) What is Referential Integrity?

f) Write the names of two techniques for using log to achieve the recovery.

g) Define force writing.

h) Define Server.

i) Define Fat client.

j) What is a trigger?

Q2) Attempt any Two of the following : **[2 × 5 = 10]**

a) Explain statistical database security.

b) How client machine interact with server? Explain with diagram.

c) Define a Transaction. Explain its properties.

P.T.O.

Q3) Attempt any Two of the following : **[2 × 5 = 10]**

a) The following is a list of representing the sequence of events in an interleaved execution of set T_1, T_2, T_3 and T_4 assuming 2PL protocol. Construct a wait for graph according to request. Is there a deadlock at any instance. Justify.

Time	Transaction	Code
t_1	T_1	Lock (A, X)
t_2	T_2	Lock (C, S)
t_3	T_3	Lock (A, S)
t_4	T_4	Lock (C, S)
t_5	T_1	Lock (B, X)
t_6	T_2	Lock (B, S)
t_7	T_3	Lock (D, S)
t_8	T_4	Lock (D, X)

b) Consider the following entities & their relationships. Employee (eno, ename, sex, Joining date, designation, salary, dno)

Dept (dno, dname)

Write a PL/PgSQL block to list the names of all employees, who are female and are earning the maximum salary in their department.

c) State and explain Thomas write rule with suitable example.

Q4) Attempt the following : **[2 × 5 = 10]**

a) Following are the entries at the time of system crash.

[Start, Transaction, T_1]

[Write-item, T_1, A, 10, 100]

[Commit, T_1]

[Check point]

[Start-Transaction, T_2]

[Write-item, T_2, B, 20, 200]

[Commit, T_2]

[Start-Transaction, T_3]

[Write-item, T_3, C, 30, 300] ← system crash.

If immediate update technique with check point is used, what will be recovery procedure?

b) What is view? Explain different statements in views.

OR

Explain following PL/PgSQL statements with syntax and example.

i) While loop.

ii) For loop.

▽▽▽▽

Total No. of Questions : 4]

SEAT No. : ____

PA-3489

[Total No. of Pages : 2

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

CS - 221 : OBJECT ORIENTED CONCEPTS USING C++

(2013 Pattern) (Semester - II) (22121) (Paper - I)

Time : 2 Hours] ***[Max. Marks : 40***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***All questions carry equal marks.***
3) ***Assume suitable data if necessary.***
4) ***Figures to the right indicate full marks.***

Q1) Attempt all of the following: **[10×1=10]**

a) What are the basic concepts of OOP?

b) How many arguments must be passed to overload a binary operator using non-member function?

c) List the operator which can be overloaded only using friend function.

d) Differentiate between ios::app and ios::out.

e) Explain any two access specifiers.

f) Give the syntax to create an object of template class.

g) What is an Exception?

h) Which header file is used for manipulators?

i) How can a comment be written in a c++?

j) What is abstract class?

Q2) Attempt any two of the following: **[2×5=10]**

a) What is copy constructor? What is its purpose? Explain with example.

b) Write a C++ program to accept the eno, ename, esalary and ebonus for five employees. Calculate total salary and display the output.

c) Explain various file stream classes needed for file manipulation.

P.T.O.

Q3) Attempt any two of the following: **[2×5=10]**

a) Write a C++ program to display the contents of a text file in reverse order. (Use pointer manipulation).

b) What is function template? Explain overloading of tempelate function.

c) Explain multiple and multilevel Inheritance with suitable example.

Q4) Attempt any One of the following (a or b): **[1×10=10]**

a) i) Explain how run time polymorphism is achieved in C++. Explain with example. **[5]**

ii) What is the output of the following program? (Assume there are no syntax errors): **[3]**

```
#include <iostream.h>
void foot( )
{
int m = 10;
static int n = 10;
++m;
n++;
cout<<m<<“ ”<<n<<“\n”;
}
int main( )
{
foo( );
foo( );
return 0;
}
```

iii) What is the use of tellg( ) and tellp( )? **[2]**

OR

b) i) Write a C++ program to add two complex number using operator overloading. (Use member function) **[5]**

ii) Explain the three keywords used for exception handling. **[3]**

iii) Explain any two uses of scope resolution operator with suitable example. **[2]**