Total No. of Questions : 5]

SEAT No. :

P1288

[Total No. of Pages : 2

[6055]-101

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

CS - 231 : DATA STRUCTURES AND ALGORITHMS - I

(2019 Pattern) (Semester - III) (23121)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicates full marks.***
3) ***Neat diagrams must be drawn whenever necessary.***

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

a) Define Data Object.

b) What are the advantages of ADT?

c) Write any two applications of Queue.

d) What is top of the stack?

e) State True or False. "Queue Follows Last in First out (LIFO) Order".

f) Write the time complexity of merge sort.

g) What is stack underflow?

h) Define space complexity.

i) What is circular queue?

j) Which data structure is used in recursion?

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

a) What are different asymptotic notations?

b) List the operations performed on dequeue.

c) Write the postfix expression of the following(A+B) * (C-D).

d) Write node structure of singly linked list.

e) Give any two applications of stack.

P.T.O.

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

a) Write a 'C' function for deleting element from singly linked list.

b) Sort the following elements using insertion sorting method.

25, 15, 45, 85, 75, 55, 35, 65.

c) Write a 'C' function to reverse singly linked list.

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

a) Explain with example - Generalized linked list.

b) Write 'C' function for implementing Linear search algorithm.

c) Evaluate the following postfix expression AB*C-(Let A = 5, B=6, C = 4).

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

a) Write a short note on priority queue.

b) Define the following terms.

i) Time complexity.

ii) Doubly Ended Queue.

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. :

P1289

[Total No. of Pages : 2

[6055]-102
S.Y.B.Sc. (Computer Science)
CS - 232 : SOFTWARE ENGINEERING
(2019 CBCS Pattern) (Semester - III) (23122)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn if necessary.***

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

a) What is Software Patterns?

b) Define : Software Engineering.

c) Explain the purpose of sequence model.

d) Define: Dependency.

e) What is agility?

f) What is the importance of design model?

g) State in brief for separation of concerns.

h) Explain requirement validation.

i) What is meant by XP?

j) Define : prototyping.

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

a) Explain in brief about waterfall model.

b) State any two symbols with an example for developing use cases.

c) State the disadvantages Incremental model.

d) What is difference between system and application software?

e) Explain the purpose of class diagram.

P.T.O.

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

a) List the activities of spiral model in detail.

b) Explain any four symbols of class diagram.

c) Draw an activity diagram for Airline reservation system.

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

a) Explain the purposes served by software requirement specification.

b) Write in detail for Dynamic system development model.

c) Explain a software process framework in detail.

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

a) Draw a sequence diagram for student registration system.

b) State any six attributes of good software.

✡ ✡ ✡

Total No. of Questions : 3]

SEAT No. :

P-1290

[Total No. Of Pages : 2

[6055]-103
S.Y. B.Sc. (COMPUTER SCIENCE)
MATHEMATICS (Paper - I)
MTC - 231: Groups and Coding Theory
(Semester-III) (2019 Pattern) (23221)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Non-programmable scientific calculator is allowed.***

Q1) Attempt any Five of the following: **[5 × 2 = 10]**

a) Prepare composition table for addition on Z_5.

b) State whether the following statement is True or False:
'Union of two subgroup is subgroup' Justify.

c) Check whether the permutation δ=(1,7,2,5) is even or odd? Justify.

d) Find remainder after dividing 111'" by 2.

e) Find Hamming distance between x and y, where, x =1101 and y = 0111.

f) Let a,b,c $\in$ Z, if a|b and b|c then show that a|c.

g) State whether the following statement is True or False:
'Every cyclic group is an abelian group' Justify.

P. T. O

Q2) Attempt any Three of the following: [3 × 5 = 15]

a) Find gcd of 687 and 819. Find integers m and n such that (819,687) =m(819) +n (687).

b) If μ = (2,3) (4,5); σ= (1,3) (2,4); τ= (1,2,3) (4,5) in S_5 then find $\mu(\tau\sigma)^{-1}$.

c) State and prove Euclids Lemma.

d) Using encoding function, f*(x)* = *x*+3 (mod 26) encode the word 'MATH'.

e) Let a,b $\in$Z, if the binary operation '$*$' is defined as a$*$b = a+b–ab, then show that G is an abelian group under operation '$*$'

Q3) Attempt any One of the following: [1 × 10 = 10]

a) i) Let a,b,x,y$\in$Z, if $a \equiv b$ (mod n) then

prove that, I) $ax \equiv bx$ (mod n)

II) $(a+x) \equiv (b+x)$ (mod n)

ii) Let R be relation on Z defined as *xRy* if and only if $5x + 6y$ is divisible by 11. Show that R is an equivalence relation on Z

b) Let p=11,q=3. Using RSA method to encode the word 'CENTRE', take e=7.

Total No. of Questions : 3]

SEAT No. :

P-1291

[Total No. of Pages : 2

[6055]-104

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

MATHEMATICS

MTC-232 : Numerical Techniques

(2019 Pattern) (Semester - III) (Paper - II) (23222)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Non-programmable scientific calculator is allowed.***

Q1) **Attempt any five questions out of seven :** **[5 × 2 = 10]**

a) Find the percentage error if 625.483 is approximated to three significant figures.

b) Write the Newton Raphson formula for square root of any real number.

c) State the Newton's Divided Difference formula.

d) Prove that : $\Delta = E - 1$ by usual notations.

e) Given that $\frac{dy}{dx} = y - x$ with $y(0) = 1$. Find $y(0.1)$ by Euler's method.

f) Given $f(1) = 7, f(2) = 10, f(3) = 13, f(4) = 16, f(5) = 19$ construct the Newton's Backward difference table.

g) Evaluate $\int_0^6 x^2 dx$ by trapezoidal rule. Take $h = 2$.

P.T.O.

Q2) **Attempt any three of the following :** **[3 × 5 = 15]**

a) Find the cubic polynomial by Lagrange's interpolation which takes the following data :

x	0	1	2	3
$f(x)$	1	0	1	10

b) Find a real root of the equation $f(x) = x^3 - 2x - 5 = 0$ in [2, 3] by the method of false position correct upto two decimal places.

c) Derive Simpson's $(1/3)^{rd}$ rule for numerical integration.

d) The population of a town in the decennial census is given as below :

Year X	1891	1901	1911	1921	1931
Population Y (in thousands)	46	66	81	93	101

Estimate the population for the year 1895 by Newton's Forward Interpolation Formula.

e) Solve by Euler's modified method the initial value problem $\frac{dy}{dx} = 1 - y$ with initial conditions $y(0) = 1$ and compute $y(0.1)$. Take $h = 0.1$.

Q3) **Attempt any one of the following :** **[1 × 10 = 10]**

a) i) Using Newton's Divided Difference formula, calculate the value of $f(6)$

x	1	2	7	8
$f(x)$	1	5	5	4

ii) Using Trapezoidal rule evaluate $\int_0^6 f(x)\,dx$ form the following data :

x	0	1	2	3	4	5	6
$f(x)$	1	0.7071	0.5773	0.5	0.4472	0.4082	0.3780

b) Given $\frac{dy}{dx} = x - y$ with $y(0) = 1$. Find $y(0.1)$ and $y(0.2)$ by using Runge - Kutta method of fourth order.

⌘⌘⌘

Total No. of Questions : 5]

SEAT No. :

P-1292

[Total No. of Pages : 2

[6055]-105

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

ELECTRONIC SCIENCE

ELC-231: Microcontroller Architecture and Programming (2019 Pattern) (Semester - III) (Paper - I) (23321)

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

Instructions to the candidates :

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Figures to the right indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Use of calculator is allowed.***

Q1) Attempt any Five : **[5 × 1 = 5]**

a) How much is the capacity of internal ROM of 8051?

b) Name the interrupt which has highest priority in 8051 microcontroller?

c) What is step size for 8-bit ADC if Vref = 4 volts.

d) Assembler directive ORG and DB of 8051 stands for?

e) What is the significance of Gate bit of TMOD register in 8051?

f) Define step angle of stepper motor.

Q2) Answer the following : **[2 × 5 = 10]**

a) Explain the operation of following instructions :

i) NOP
ii) MUL AB
iii) CLR C
iv) MOV DPTR, # 1234H
v) RL A

b) Draw and explain simplified block diagram of 8051 microcontroller?

P.T.O.

Q3) Answer the following : **[2 × 5 = 10]**

a) Write a 8051 C-program to generate 1kHz square waveform on port pin P2.5 using Timer 1, mode 1 (Assume Xtal = 12 MHz).

b) Explain any 5 addressing modes of 8051.

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

a) Draw bit format of IE register and write significance of each bit.

b) Draw a block diagram of interfacing of DAC 0808 and write a C-program to generate sawtooth waveform.

Q5) Write a short note on any four of the following : **[4 × 2½ = 10]**

a) Data transfer instructions (any three).

b) Parallel ports.

c) Synchronous communication.

d) TMOD register.

e) Difference between Microprocessor and Microcontroller (Any three).

Total No. of Questions : 3]

SEAT No. : ____

P-1470

[Total No. of Pages :1

[6055]-107
S.Y. B.Sc. (Computer Science/Biotechnology/BCA)
ENGLISH
AECC II : Languge Communication - I
(2019 Pattern) (Semester - III) (23922)

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

Instructions to the candidates :

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

Q1) Attempt any one of the following in about 150-200 words. **[15]**

a) Comment on the appropriateness of the title of the poem 'La belle sans merci.

b) How does the author deal with the idea of death and memory in the story 'A shadow'?

Q2) Attempt any two of the following in about 50-80 words. **[10]**

a) Your friend Rahul apologises to your class teacher for not submitting the project in time, Develop a conversation.

b) Renuka asks his boss for permission to take leave but he refuses. Develop a dialogue.

c) Develop a dialogue on the following situation :

"Priti introduces her friend shital to her father".

Q3) Attempt any two of the following in about 50-80 words. **[10]**

a) How Visual aids play vital role in presentation?

b) What is Group Discussion?

c) Write a resume to be sent in response to the advertisement for the post of 'Lab Assistant'.

Total No. of Questions : 5]

SEAT No. :

P-1294

[Total No. of Pages : 2

[6055]-201
S.Y. B.Sc. (Semester - IV)
COMPUTER SCIENCE
CS 241 : Data Structures and Algorithms - II
(2019 Pattern) (CBCS) (24121)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn whenever necessary.***
4) ***Your answers will be value as whole.***

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

a) Define min heap.

b) What is level order traversal?

c) What is descendant in tree?

d) In B+ tree data can only be stored in leaf node. State true or false.

e) List AVL tree Rotations.

f) List any two minimum spanning tree algorithms.

g) "DFS uses queue implementation". State true or false.

h) What is weighted graph?

i) What is load factor?

j) What is hashing?

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

a) Write a note on minimum spanning tree.

b) Write a note on splay tree.

c) Give any two differences between DFs & BFs.

d) Explain any two properties of good hash function.

e) Write a note on B tree.

P.T.O.

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

a) Write a 'C' function to calculate

i) leaf nodes

ii) non leaf nodes

b) Write a program that accepts adjacency matrix and print indegree and outdegree of each vertex.

c) Write a program to insert new element in hash table.

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

a) Construct Red Black Tree for 2, 10, 7, 20, 30, 25, 50.

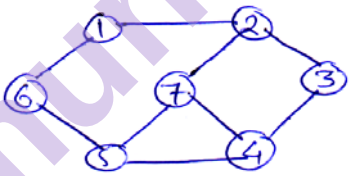
b) Consider following adjacency matrix

$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

i) Draw the graph

ii) Give adjacency list

c) Construct minimum spanning tree using Kruskal's algorithm.



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

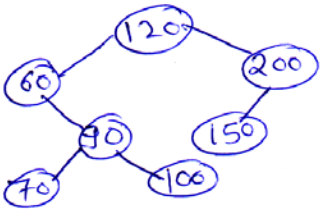
a) Define the following terms :

i) Terminal node

ii) depth of node

iii) root node

b) Give inorder, preorder and postorder traversal for :



Total No. of Questions : 5]

SEAT No. :

P1295

[Total No. of Pages : 2

[6055]-202
S.Y.B.Sc. (Computer Science)
CS-242 : COMPUTER NETWORKS - I
(2019 Pattern) (Semester - IV) (24122)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagram must be drawn if necessary.***

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

a) Define Bandwidth.

b) What is throughput?

c) What is Jitter?

d) List the control access protocols.

e) Define packetizing.

f) Write IPv6 address space.

g) List UDP services.

h) Write the list of states for TcP.

i) What is full duplex communication?

j) Write the registered ports.

Q2) Attempt any Four of the following (out of FIVE). **[4×2=8]**

a) Write a note on BSS.

b) What are the different layers in the TCP/IP reference model?

c) Write the netid & host ID of IP address: 117. 149. 29.4.

d) What are the two sub layers of data link layer?

e) Write the different control bits or flags in control field of TCP segment.

P.T.O.

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

a) What is the propagation time for a 2.5 Kbyte message if the bandwidth of the network is 1 Gbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s.

b) Write the some important design issues of the data link layer.

c) What are the main properties of routing?

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

a) Write the difference between TCP & UDP.

b) Explain sliding window in TCP.

c) Write the base header format of IPv6.

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

a) Describe bus topology in detail.

b) Write the difference between IPv4 and IPv6.

✡ ✡ ✡

Total No. of Questions :3] SEAT No. :

P1296 [Total No. of Pages : 3

[6055]-203
S.Y. B.Sc.(Computer Science)
MATHEMATICS (Paper-I)
MTC-241: Computational Geometry
(2019 Pattern) (Semester - IV) (24221)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Non-Programmable scientific calculator is allowed.***

Q1) Attempt any Five of the following. **[5 × 2 = 10]**

a) Write any two properties of Be′zier curve

b) If the transformation matrix $[T]=\begin{bmatrix} 4 & 3 \\ -1 & 2 \end{bmatrix}$ is used to transform rectangle with length 3 cm and breadth 5 cm respectively, then find area of transfermed figure.

c) Is $[T]=\begin{bmatrix} \frac{1}{2} & \sqrt{\frac{3}{2}} \\ -\sqrt{\frac{3}{2}} & \frac{1}{2} \end{bmatrix}$ gives a solid body transformation? Justify.

d) Determine forshortening factors f_x and f_z, if transformations matrix for axonometrix projection is $[T]=\begin{bmatrix} 0.5 & 0.43 & 0 & 0 \\ 0 & 0.86 & 0 & 0 \\ 0.86 & 0.25 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

e) Find $\delta\theta$ to generate uniformly spaced 20 point on the circle $x^2+y^2=?$ ($\delta\theta$ is the angle of rotation)

P.T.O.

f) Explain the effect of transformation matrix [T]= $\begin{bmatrix} 1 & 0 & -2 & 0 \\ 0 & 1 & 3 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ on three dimensional object.

g) Give transformation matrix in three dimensional space which gives trimetric projection for $\theta = 30^{o}$ and $\theta = 45^{o}$.

Q2) Attempt any Three of the following. **[3×5=15]**

a) Find combine transformation matrix for the following sequence of transformations.

i) Scaling in x and y co-ordinary by factors –1 and 2 units respectively.

ii) Reflection through X-axis.

iii) Rotation about origin by an angle 270°. Apply this combine transformation matrix on the point P [2–3]

b) Reflect Δ ABC through the line y = 3, where A[–2–3], B[–10–6] C[–15–10].

c) Find combine transformation matrix for the following sequence of transformations.

i) Rotation about y–axis by an angle –30°

ii) Rotation about x–axis by an angle 45°

iii) Perspective projection with centre of projection on z-axis at the point [0.0,2.5,1]

d) Obtain isometric projection of the line segment joining the points [1–2 1] and [31–6] $(\theta > 0, \phi > 0)$.

e) Consider the line with direction ratios 1,1,1 and passing through the origin. Determine angles through which the line should be rotated about x-axis and then about y-axis so that it coincide with z-axis.

Q3) Attempt any One of the following. **[1×10=10]**

a) Find parametric equation of Be′zier curve determined by control points $B_0[-1-1]$ $B_1[2\ 3]$ B_2 [3 3], $B_3[5\ 2]$. Also find P(0.6), P(0.7), P(0.8).

b) i) Obtain uniformly spaced three points in the first quadrant of the circle $x^2+y^2=16$.

ii) Find cavalier and cabinet projection of the object represented by the following position vector matrix [X] with horizontal inclination $\alpha=25°$, where $[X]=\begin{bmatrix} 1 & 2 & 1 \\ 3 & 4 & -1 \\ -1 & -2 & 1 \\ 2 & 1 & 1 \end{bmatrix}$

◆ ◆ ◆

Total No. of Questions : 3]

SEAT No. :

P-1297

[Total No. of Pages : 4

[6055]-204
S.Y. B.Sc. (Computer Science)
MATHEMATICS
MTC - 242 : Operations Research
(2019 Pattern) (Semester - IV) (Paper - II) (24222)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicates full marks.***
3) ***Non-programmable scientific calculator is allowed.***

Q1) Attempt any Five of the following : **[2 × 5 = 10]**

a) Draw a feasible region for the following constraints.

$3x + y \leq 6$

$x + 2y = 4$

b) Give any two fields where operations research is used.

c) Define degeneracy in transportation problem.

d) Solve the following assignment problem for minimization.

	A	B	C
1	12	10	8
2	8	9	11
3	14	11	12

e) Obtain Initial Basic Feasible Solution of the transportation problem by using least cost entry method.

	D_1	D_2	D_3	Supply
O_1	7	3	12	20
O_2	5	6	10	14
Demand	10	11	13	

P.T.O.

f) Write dual of the following linear programming problem

Minimize $Z = 3x_1 + 25x_2$

Subject to

$2x_1 + 4x_2 \geq 40$

$3x_1 + 2x_2 \geq 50$

$x_1, x_2 \geq 0$

g) Write standard form of the following linear programming problem

Minimize $Z = 4x_1 + 3x_2$

Subject to

$2x_1 + x_2 \geq 10$

$-3x_1 + 2x_2 \leq 6$

$x_1, x_2 \geq 0$

Q2) Attempt any Three of the following : **[3 × 5 = 15]**

a) Solve the following assignment problem.

	I	II	III	IV	V
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

b) Solve the linear programming problem by graphical method.

Minimize $Z = 5x + 2y$

Subject to

$10x + 2y \geq 20$

$5x + 5y \geq 30$

$x, y \geq 0$

c) Solve the following linear programming problem by Big-M method.

Max $Z = 2x_1 + x_2$

Subject to

$$2x_1 - x_2 \leq 1$$

$$x_1 - x_2 \geq 1$$

$$x_1, x_2 \geq 0$$

d) Obtain an Initial Basic Feasible solution to the following transportation problem by North-West corner method.

	W_1	W_2	W_3	W_4	Capacity
F_1	19	30	50	10	7
F_2	70	30	40	60	9
F_3	40	8	70	20	18
Requirement	5	8	7	14	34

e) Find an Initial Basic Feasible to the following Transportation Problem Using Vogel's Approximation method.

	D_1	D_2	D_3	D_4	Supply
P_1	2	3	11	7	6
P_2	1	0	6	1	1
P_3	5	8	15	9	10
Demand	7	5	3	2	17

Q3) Attempt any One of the following : **[1 × 10 = 10]**

a) Obtain initial basic feasible solution of the following transportation problem using modified Distribution method.

	D_1	D_2	D_3	D_4	
W_1	(35) 6	(35) 1	9	3	70
W_2	(5) 11	5	(50) 2	8	55
W_3	(45) 10	12	4	(45) 7	90
	85	35	50	45	215

b) i) Solve the following linear programming problem by simplex method

Max $Z = 7x_1 + 5x_2$

Subject to

$$x_1 + 2x_2 \leq 6$$

$$4x_1 + 3x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

ii) Solve the following assignment problem.

Machines

Jobs		A	B	C	D
	J_1	5	5	–	2
	J_2	7	4	2	3
	J_3	9	3	5	–
	J_4	7	2	6	7

▽▽▽▽

Total No. of Questions : 5]

SEAT No. :

P1298

[Total No. of Pages : 2

[6055]-205

S.Y.B.Sc. (Computer Science)
ELECTRONICS SCIENCE
ELC - 241 : Embedded System Design
(2019 Pattern) (Semester - IV) (24321) (Paper - I)

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

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Figures to the right indicates full marks.***
4) ***Neat diagrams must be drawn whenever neccessary.***
5) ***Use of calculator is allowed.***

Q1) Attempt any Five. **[5×1=5]**

a) State use of UART in communication.

b) What does the term flexibility related to soc's?

c) State role of watchdog module in soc's.

d) What is the use of 'print str[o]' instruction in python?

e) List any two standard datatypes in python.

f) State use of 'GPIO. Cleanup ()' function.

Q2) Answer the following. **[2×5=10]**

a) Explain embedded system with a general layout diagram.

b) Draw the proper interfacing diagram of PIR sensor to Raspberry Pi. Write a python program for defection of motion.

Q3) Answer the following. **[2×5=10]**

a) Explain Branch prediction and folding concept.

b) List any four assignment operators in python. Write a python program for multiplication of two numbers.

Q4) Answer the following. **[2×5=10]**

a) What is the library function? State the use of following instructions.

i) print tuple [o]

ii) dict (d)

iii) time ( )

b) With proper circuit diagram explain LCD interfacing to Raspberry Pi.

P.T.O.

Q5) Write short note on any four of the following. **[4×2.5=10]**

a) SOC.

b) Microcontroller.

c) Digital signal processors.

d) Network on a chip.

e) NOOBS.

f) Bluetooth module.

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. :

P-1299

[Total No. Of Pages : 2

[6055]-206
S.Y.B.Sc. (Computer Science)
ELECTRONICS
ELC 242-Wireless Communication and Internet of Things
(Semester-IV) (2019 Pattern) (Paper II) (24322)

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

Instructions to the candidates :

1) ***Q.1 is compulsory.***
2) ***Solve any three questions for Q2 to Q5.***
3) ***Figures to the right indicate full marks.***
4) ***Use of calculator is allowed.***

Q1) Answer the following in one or two sentences each (any Five) **[5 × 1 = 5]**

a) What is handoff?

b) What do you mean by scalability of IoT?

c) State act least two applications of IoT.

d) What does GPS stand for?

e) What is full form of

i) Iaas ii) Saas

f) List four elements of RFID system.

Q2) Answer the following: **[2 × 5 = 10]**

a) Explain GPS architecture with neat lebelled diagram.

b) Compare between Zigbee and Bluetooth technologies.

P.T.O

Q3) Answer the following: **[2 × 5 = 10]**

a) Draw block diagram of mobile handset and describe function of any two blocks.

b) Draw diagram of zigbee architecture and state functions of each layer.

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

a) Compare M2M and IoT.

b) Draw block diagram and explain concept of smart city system using IoT.

Q5) **Write a short note on any four of the following:** **[4 × 2.5 = 10]**

a) VLR block of NSS of GSM system

b) Private cloud

c) Mesh topology in zigbee network

d) Features of Z-wave

e) Secure connectivity in IoT

f) 4G - LTE.

Total No. of Questions : 5]

SEAT No. :

P-1300

[Total No. of Pages :2

[6055]-301
T.Y. B.Sc. (Computer Science)
CS - 351 : OPERATING SYSTEMS - I
(2019 Pattern) (Semester - V) (Paper - I) (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 EIGHT of the following (out of ten) : **[8 × 1 = 8]**

a) What is shell?

b) What is thread?

c) List types of system calls.

d) State role of medium term schedular.

e) What is CPU - I/O burst cycle?

f) What is race condition?

g) Define response time?

h) Define Semaphore.

i) What is page table?

j) What is segmentation?

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

a) What is operating system? List objectives of operating system.

b) Define critical section problem. Explain in detail.

c) Compare LFU and MFU with two points.

d) What is purpose of scheduling algorithm.

P.T.O.

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

a) With the help of diagram describe process states.

b) Consider following set of processes CPU time given in milliseconds. Illustrate execution of processes using FCFS and preemptive SJF CPU scheduling algorithm and calculate turn around time, waiting time, average turn around time, average waiting time.

Processes	Burst time	A.T
P_0	5	1
P_1	3	0
P_2	2	2
P_3	4	3
P_4	8	2

c) What is fragmentation? Explain with all its types.

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

a) Describe PCB with all its fields.

b) Which three requirements must be satisfied while designing a solution to critical section problem? Explain each in detail.

c) Consider the following reference string

1,2,3,4,2,1,5,6,2,1,3.

Assume 3 frames. Find the number of page faults according to FIFO, OPT. page replacement algorithms.

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

a) Describe the term distributed operating system. State its advt. and disadvantages.

b) With the help of diagram describe swapping.

Total No. of Questions : 5]

SEAT No. :

P1301

[Total No. of Pages : 2

[6055]-302

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

CS - 352 : COMPUTER NETWORKS - II

(CBCS 2019 Pattern) (Semester - V)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Draw neat and labelled diagrams wherever necessary.***
3) ***Use of calculators is not allowed.***

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

a) What is FQDN?

b) Where does MIME header appear?

c) What is an anonymous FTP?

d) Give purpose of RTCP.

e) What is playback buffer?

f) What is Cypher key?

g) Does SSL mean HTTPS?

h) What does a VPN do for?

i) Define firewall.

j) What is the root server in DNS?

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

a) Explain Working of POP3.

b) Discuss streaming live audio/video and give its examples.

c) What is meant by transposition cipher? Give example.

d) Explain working of TLS.

e) What PGP? Write its purpose.

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

a) What are the advantages and disadvantages of recursive DNS?

b) Write a short note on SIP.

c) What are the steps used in DES?

P.T.O.

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

a) What is MAC? HMAC? Give one difference.

b) Discuss various IPSec services.

c) What is firewall? What are its types?

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

a) How do digital signatures work?

b) In an RSA cryptosystem, a particular A uses two prime numbers, 13 and 17, to generate the public and private keys. If the public of A is 35. Then the private key of A is?

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. :

P1302

[Total No. of Pages : 2

[6055]-303

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

CS - 353 : WEB TECHNOLOGIES - 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 are compound data types in PHP?
b) Write syntax to define a constant in PHP.
c) What is use of CSS selectors?
d) What is Lambda function?
e) Which function read the data from files with the assumption that it is properly formatted in CSV and puts data into an array?
f) Write a name of function that enables you to print the contents of a file without even having to call fopen ().
g) What is use of SMTP component, Mail Transfer Agent?
h) What is use of Post Office Protocol 3?
i) What is use array_flip () function?
j) Which function is use to reposition the file pointer to the beginning of the file?

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

a) Explain List in HTML.
b) What is Casting of operators?
c) Find the Output.

```
<?php
$subjects = array ('physics', 'chem', 'math', 'bio', 'cs', 'drama');
$ rl = array _ splice ($subjects, 2, 3);
print_r($subjects);
?>
```

d) Explain following functions.
   i) var_dump()
   ii) Trim ()
e) Define the types of web pages?

P.T.O.

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

a) Explain features of PHP.

b) Explain any two control statements with syntax and example.

c) Explain the following functions with example.

i) explode (),

ii) implode ()

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

a) Program to check whether the enter number is Palindrome or not (Accept number from user).

b) Write a PHP program to sort array on marks (Array contains names and marks).

c) Consider the following relational database: Movie (Movie_no, Movie_name, ryear).
Write a PHP script which displays all movies name released in the year 2010.

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

a) Explain with example PEAR DB basics.

b) Explain mail() function with syntax.

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. :

P-1303

[Total No. of Pages : 2

[6055]-304

T.Y. B.Sc.

COMPUTER SCIENCE

CS - 354 : Foundations of Data Science

(2019 Pattern) (CBCS) (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 :** **[8 × 1 = 8]**

a) List any two application of Data Science.

b) What is outlier?

c) What is missing values?

d) Define variance.

e) What is nominal attribute?

f) What is data transformation?

g) What is one hot coding?

h) What is the use of Bubble plot?

i) Define Data visualisation.

j) Define Standard deviation?

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

a) Differentiate structured and Unstructured Data.

b) What is inferential statistics?

c) What do you mean by data preprocessing?

d) Define data discretization.

e) What is visual encoding?

P.T.O.

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

a) Explain outlier detection methods in brief.

b) Write different data visualization libraries in python.

c) What is data cleaning? Explain any two data cleaning methods.

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

a) Explain 3V's of Data Science.

b) Explain data cube aggregation method in detail.

c) Explain any two data transformation technique in detail.

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

a) Write a short note on feature extraction.

b) Explain Exploratory Data Analysis (EDA) in detail.

x x x

Total No. of Questions : 5]

SEAT No. :

P-1304

[Total No. of Pages : 2

[6055]-305

T.Y. B.Sc.

COMPUTER SCIENCE

CS-355: Object Oriented Programming using Java - I

(2019 Pattern) (Semester - V) (CBCS) (Paper - 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 :** **[8 × 1 = 8]**

a) What is javadoc?

b) What are command line argument?

c) Define Constructor.

d) List any two wrapper classes.

e) Write the use of extends key word.

f) Define functional interface.

g) List any two uncheck exception.

h) How to open file in read mode?

i) What is AWT?

j) Give the names of any two Adaptor class.

P.T.O.

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

a) Differentiate between String and StringBuffer class.

b) State any four features of java.

c) What is polymorphism? How to implement it at compile time?

d) How to define and handle user defined exception?

e) What is listener? How to inherit it in program?

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

a) Write a java program to copy the content from one file to another file, while copying change the case of alphabets.

b) Write a java program using swing to accept details of employee (eno, ename, esal) and display it by clicking on a button.

c) Define abstract class shape with abstract method area (). Write a java program to calculate area of circle.

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

a) Write a java program to give Red colour at the background of TextField by clicking on a button.

b) Explain the uses of super keyword with example.

c) What is string? Explain its any three method with an example.

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

a) Explain the execution process of java program.

b) Explain MVC architecture in details.

Total No. of Questions : 5]

SEAT No. :

P-1305

[Total No. of Pages : 2

[6055]-306

T.Y. B.Sc.

COMPUTER SCIENCE

CS - 356 : Theoretical computer science

(2019 Pattern) (CBCS) (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) Write output function λ of Moore and Mealy machines.

b) List all the proper prefixes of the string "ABCD'.

c) Define Nullable symbol.

d) Give formal definition of Pushdown Automata.

e) Define right linear grammar.

f) State True or False. DFA do not have multiple final states.

g) Name the type of language accepted by Turing Machine.

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. l0+(0+l 1)0*1

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

a) Explain Reduction with the help of example.

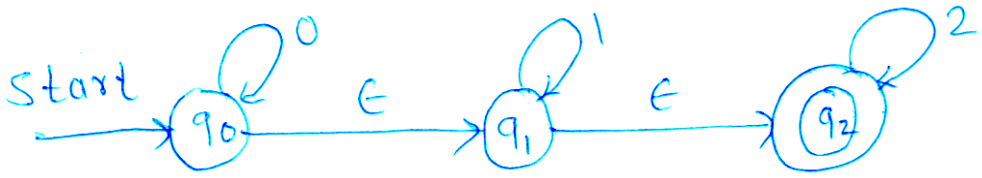
b) Construct FA for regular expression.

(0l+l0)*+ 11

c) Differentiate between DFA and NFA.

P.T.O.

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



e) Define types of Turing Machine.

Q3) Attempt <u>any two</u> of the following : (Out of THREE) [2 × 4 = 8]

a) Construct a DFA for a language over Σ = {0,1 }

L1∩L2

L1 = { All strings starting with '0'}

L2 = { All strings not having '01' as substring}

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

S-> aSa | bSb | a | b| aa | bb

c) Construct TM which accepts the language that start with 0 and ends with 1.

Q4) Attempt <u>any two</u> of the following : (Out of THREE) [2 × 4 = 8]

a) Construct a PDA for the language L = $\{a^n b^n \mid n>=1\}$

b) Construct a Mealy machine for the language L over Σ = {0, 1} which outputs 'A' if it has substring '101'. it outputs 'B' if it has substring '110', otherwise it outputs 'C'.

c) Write a short note on Chomsky's hierarchy.

Q5) Attempt <u>any one</u> of the following : (Out of TWO) [1 × 3 = 3]

a) Construct a Moore machine over alphabet {0,1} to get l's compliment of a given binary string.

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

Total No. of Questions : 5]

SEAT No. :

P-1306

[Total No. of Pages : 3

[6055]-307

T.Y.B.Sc.

COMPUTER SCIENCE

CS-3510: Python Programming

(2019 Pattern) (CBCS) (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.***
3) ***Total number of questions are five.***

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

a) How are comments written in Python?

b) Give the use of index() in string.

c) Explain the range() function and its parameters.

d) How to create a void function in Python?

e) What is the difference between pop() and del in list.

f) Compare list and tuple (any two points).

g) What does the following functions return - clock() and gmtime().

h) List the syntax for handling exception.

i) List any two functions in math module.

j) Explain the function enumerate().

P.T.O.

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

a) Which methods are used to read from a file? Explain any two with example.

b) What are the usage of dictionary copy(), gets(), items() and keys() methods?

c) Explain union and intersection with example.

d) Explain the following statement

i) if b) if else c) break d) continue

e) List features of Python.

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

a) Write a program to get a single string from two given strings, separated by space and swap the first two characters of each string

Sample input: 'abc', 'pqr'

Output: pqc abr

b) Write a program to display power of 2 upto a given number using anonymous function

Example

N = 2

2 raised to 0 is 1

2 raised to 1 is 2

2 raised to 2 is 4

c) Write a program to read an entire text file.

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

a) Write a python program to Count Vowels and Consonants in a String.

b) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are the square of the keys.

Sample Dictionary

{1: 1, 2:4, 3:9, 4: 16, 5:25, 6:36, 7:49, 8:64, 9:81, 10: 100, 11: 121, 12: 144, 13: 169, 14: 196, 15: 225}

c) Write a Python function that accepts a string and counts the number of upper and lower case letters.

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

a)

```
a = True
b = False
c = False
if not a or b:
    print (1)
elif not a or not b and c:
    print (2)
elif not a or b or not b and a:
    print (3)
else:
    print (4)
```

b)

```
def f 1(x, 1=[ ]):
    for i in range(x):
        1.append(i*i)
    print(1)
f1 (2)
f1 (3,[3,2,1])
f1 (3)
```

❍❍❍❍

Total No. of Questions : 5]

SEAT No. :

P-1307

[Total No. of Pages : 2

[6055]-308

T.Y. B.Sc.

COMPUTER SCIENCE

CS-3511 : Blockchain Technology

(2019 Pattern) (CBCS) (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.***
3) ***Neat diagrams must be drawn wherever required.***

Q1) Attempt any EIGHT of the following (out of TEN) : **[8 × 1 = 8]**

a) What is Non-repudiation?

b) What is difficulty in a block?

c) In which network, each & every node itself is a client and server?

d) What is Ether?

e) What is consensus?

f) What is full node?

g) What is Remix?

h) What is immutable ledger?

i) Define genesis block.

j) What is EVM?

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

a) Define Symmetric and asymmetric key cryptography.

b) What is stream cipher & block cipher?

c) List the applications of hash function.

d) What is Gas and Gas Limit?

e) What is the purpose of test network? List Ethereum testnets.

P.T.O.

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

a) Compare client server & peer to peer architecture.

b) Explain the contents of block of a blockchain.

c) Explain Ethereum architecture with neat diagram.

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

a) Enumerate and explain types of blockchain.

b) Write a short note on ICO.

c) Explain forking with types.

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

a) Explain the uses of SHA-256 algorithm.

b) What are the tasks of miners?

□□□

Total No. of Questions: 5]

SEAT No. : ____

P1308

[Total No. of Pages :2

[6055]-401
T.Y. B.Sc. (Computer Science)
CS-361 : OPERATING SYSTEMS-II
(2019 Pattern) (Semester-VI)

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 claim edge?

b) What is request edge?

c) List any two file attributes.

d) List any two Disk performance parameters.

e) Define distributed system.

f) Write any two design goals of distributed systems.

g) What is cluster computer?

h) What is grid computing?

i) What is size scalability in distributed systems?

j) What is kernel?

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

a) What are advantages of windows mobile OS?

b) Write the difference between SCAN & Look disk Scheduling algorithms.

c) Explain in brief sensor network.

d) Write a short note on centralised organisation system architecture.

e) Define.

   i) Seek time

   ii) Rotational latency

P.T.O.

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

a) Consider the given snapshot of the system. A system has 5 processes and 3 types of resources A,B,C.

	Allocation		
	A	B	C
P_0	0	1	0
P_1	2	0	0
P_2	3	0	2
P_3	2	1	1
P_4	0	0	2

Max		
A	B	C
7	5	3
3	2	2
9	0	2
2	2	2
4	3	3

Available		
A	B	C
3	3	2

Answer the following questions using Banker's algorithm

i) What are the contents of need arrary?

ii) Is the system is in the safe state give the safe sequence.

b) Explain any four file operations

c) Write a note on cloud computing system

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

a) Explain the benefits or advantages of distributed systems.

b) Explain any two deadlock prevention strategies.

c) Explain sequential access & direct access methods of files.

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) Give a comparative study of Android OS and Apple IOS mobile operating systems.

Total No. of Questions : 5]

SEAT No. :

P-1309

[Total No. of Pages : 2

[6055]-402
T.Y. B.Sc. (Semester - VI)
COMPUTER SCIENCE
CS-362 : Software Testing
(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.***
3) ***Assume suitable data if necessary.***

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

a) Define the term errors.

b) What is stub?

c) Write a goal of white Box testing.

d) What is test plan?

e) Write two methods of Black Box Testing.

f) Write dimensions of quality.

g) What do you mean by performance Testing?

h) Write a goal of unit testing.

i) Which is a core agile principle?

j) Define the term Regression Testing.

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

a) Write an advantages of white box testing.

b) Explain the working of web application.

c) Explain various forms of acceptance testing.

d) Write features of agile testing.

e) Explain various types of system testing.

P.T.O.

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

a) Explain the difference between Testing and Debugging.

b) What is Cyclomatic complexity and Graph matrix? Explain with example.

c) Explain the process of stress testing with example.

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

a) Define navigation testing. How to test navigation syntax and semantics?

b) Define the term test case. Explain with example test case.

c) Compare verification and validation.

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

a) Explain the various phases of internationalization testing.

b) Difference between Alpha and Beta Testing.

Total No. of Questions : 5]

SEAT No. :

P1310

[Total No. of Pages : 2

[6055]-403
T.Y.B.Sc. (Computer Science)
CS-363 : WEB TECHNOLOGIES - II
(2019 Pattern) (Semester - VI)

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) Which function is used to print an error message and exit from current code?

b) What is sticky form?

c) XML Parser cannot alter documents or create new documents. Justify True or False.

d) What is DOM?

e) How the variables declared in Javascript?

f) What is JQuery?

g) Give any two applications of AJAX.

h) Which object is Ajax make web page interactive?

i) What is Code Igniter?

j) Which function is used for page redirecting?

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

a) Discuss differences between GET and POST method.

b) Explain any five elements of $_server variable.

c) Explain the concept of session handling with example.

d) Explain the structure of well-formed XML document.

e) Draw and explain AJAX web application module.

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

a) Explain the workflow of MVC Architecture.

b) Which are the fields used in cookies?

c) What is XML parser? Explain it with its types.

P.T.O.

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

a) Write a JavaScript code to display message - 'Exams are near, Prepare well for it" using alert, prompt and confirm boxes. Accept proper input from user and display messages accordingly.

b) Write a php program to add or append in paragraph text and also in the numbered (ordered) list in a given HTML document using jQuery selectors.

c) Write an Ajax program to search Student Name according to the character typed and display list using array.

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

a) Write XML syntax rules.

b) What are Query selectors? Explain in brief.

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. :

P-1312

[Total No. of Pages : 2

[6055]-405

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

CS - 365 : OBJECT ORIENTED PROGRAMMING USING JAVA - II

(2019 Pattern) (Semester - VI) (CBCS) (Paper - 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 :** **[8 × 1 = 8]**

a) Define collection.

b) Give the name of JDBC API.

c) What is interthread communication?

d) What is servlet?

e) How to represent expression in JSP?

f) List modules in spring.

g) Which interface is implemented by hashset class?

h) What is use of get connection ()?

i) Define multithreading.

j) What is session?

P.T.O.

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

a) Differentiate between list and set interface.

b) What is result set interface? List any two fields of it.

c) Write a syntax of doGet ()

d) What are advantages of JSP over servlet?

e) How to create a thread in multithreading?

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

a) Write a java program to accept N integer from user store them into suitable collection and display only even integers.

b) Write a Java program to accept details of teacher (Tid, Tname, Tsubject), store it into database and display it.

c) Write a JSP program to accept user name and greets the user according to time of system.

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

a) Explain life cycle of JSP.

b) Explain synchronization with an example.

c) Write a Java program to update the salary of a given employee (use prepared statement interface). Assume Emp table (Eno, Ename, Esal) is already created.

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

a) What is spring frame work? Explain its advantages.

b) Explain execution process of servlet application.

Total No. of Questions : 5]

SEAT No. :

P1313

[Total No. of Pages : 2

[6055]- 406
T.Y. B.Sc. (Computer Science)
CS - 366 : COMPILER CONSTRUCTION
(2019 Pattern) (CBCS) (Semester - VI)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figure to right indicate full marks.***

Q1) Attempt any EIGHT of the following (Out of 10) **[8×1=8]**

a) Define cross - compiler.

b) State the advantages of Boot-strapping.

c) What is sentinels?

d) State the use of function retract( ).

e) Name the types of LR parsers.

f) What does second 'L' stand for LL(1) parser?

g) What is the purpose of augmenting the grammar?

h) Define synthesize attribute.

i) What is basic block?

j) Define DAG.

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

a) Construct the DAG for the following expression.

b ∗ (a + c) + (a + c) ∗ d

b) What are the basic task & auxiliary task of a lexical analyzes?

c) Write any two limitations of top down parsing.

d) Define S-attributed grammar and L-attributed grammar.

e) Differentiate between top-down parsing & Bottom-up parsing.

P.T.O.

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

a) Check whether the following grammar is SLR or not.

$S \rightarrow 0A2$

$A \rightarrow 1A1 \mid 1$

b) Write a lex program to find the sum of n numbers.

c) Write recursive descent parser for the following grammar.

$S \rightarrow aSa \mid sb \mid ss \mid b$

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

a) Write the steps of creation of lexical analyzer on lex. Explain the lex library functions associated with lex.

b) Check whether following grammar is LALR (1) or not.

$S \rightarrow A\,a\;A\,b \mid B\,b\;B\,a$

$A \rightarrow \in$

$B \rightarrow \in$

c) For the input expression (2+3) * (3+4) design SDD and draw annotated tree using following grammar.

$L \rightarrow E$

$E \rightarrow E_1 + T \mid T$

$T \rightarrow T_1 * F \mid F$

$F \rightarrow (E) \mid \text{digit}$

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

a) Consider the following operator grammar

$E \rightarrow E + E \mid E * E \mid id$

Construct the operation precedence relation table.

b) Construct triple and indirect triple for the following strings.

$a + b * c + d * e \uparrow f \,\&\, x + b * c$

Total No. of Questions : 5]

SEAT No. :

P-1314

[Total No. Of Pages : 2

[6055]-407
T.Y.B.Sc. (Computer Science)
CS - 3610: Software Testing and Tools
(Semester-VI) (2019 Pattern) (Paper VII) (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 smoke testing.

b) Define code coverage with formula.

c) Enlist any two bug tracking tool.

d) Explain test plan.

e) Enlist any two types of loop testing.

f) Enlist any two objective of writing test cases.

g) What are functional defects?

h) Enlist any two types of defects.

i) What is automation testing?

j) Silk test is most popular testing tool specifically design for regression and functionality testing. State true or false.

Q2) **Attempt any Four of following (out of Five):** **[4 × 2 = 8]**

a) Enlist any two feature of bugzilla.

b) Write any two advantages of branch coverage.

c) What is test summary report?

d) Write any two causes of defect.

e) Write any two limitations of manual testing.

P.T.O

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

a) What are entry and exit criteria?

b) Explain path coverage testing.

c) Explain design defects with its different types.

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

a) Write test plan for the functionality of Flipkart login page.

b) Explain winrunner tool.

c) Consider following code-

Inpur (int x,int y){

Sub=x-y;

If(sub>0)

Print("Positive")

else

Print("Negative")

}

Test case 1: x = 10, y = 03

Test case 2: x = 10, y = 15

Consider the above test cases and find the percentage of statement coverage.

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

a) Explain severity defect with its types.

b) What are unit testing and load testing.