

# CBCS SCHEME

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15CS61

Sixth Semester B.E. Degree Examination, June/July 2019

## Cryptography, Network Security and Cyber Law

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Describe the types of Vulnerabilities to domain of security. (04 Marks)  
b. List the guiding principles of security. (04 Marks)  
c. Write the extended Euclidean algorithm, with an example. (08 Marks)

OR

- 2 a. Calculate the value of x using Chinese remainder theorem by given below data :  
 $N = 210$  ,  $n_1 = 5$  ,  $n_2 = 6$  ,  $n_3 = 7$  ,  $x_1 = 3$  ,  $x_2 = 5$  ,  $x_3 = 2$ . (05 Marks)  
b. Explain the Vigenere Cipher and the Hill Cipher techniques with illustration. (06 Marks)  
c. With neat diagram, explain Fiestel structure. (05 Marks)

### Module-2

- 3 a. Illustrate the RSA algorithm for encryption and decryption. (08 Marks)  
b. Briefly explain the practical issues of RSA algorithm. (04 Marks)  
c. List the properties of the cryptographic hash. (04 Marks)

OR

- 4 a. Discuss the case study : SHA – I. (08 Marks)  
b. Explain the Man – In – the Middle attack on Diffie – Hellman key exchange, with neat diagram. (08 Marks)

### Module-3

- 5 a. Explain the different Public Key Infrastructure (PKI) architectures. (08 Marks)  
b. Describe the Mutual authentication using a shared secret. (08 Marks)

OR

- 6 a. Explain the Kerberos message sequence with diagram. (06 Marks)  
b. Describe the IP Sec protocols Authentication Header and Encapsulating Security Pay load in transport mode. (05 Marks)  
c. Explain Secure Sockets Layer (SSL) hand shake protocol. (05 Marks)

### Module-4

- 7 a. Explain the Authentication and Master Session Key exchange in 802.11i. (05 Marks)  
b. List and explain the worm characteristics. (05 Marks)  
c. Explain Firewall functionality and Proxy fire wall. (06 Marks)

OR

- 8 a. Write a note on Intrusion Detection System (IDS). (05 Marks)  
b. Explain the types of Intrusion Detection System. (05 Marks)  
c. Briefly explain the Technologies for Web Services. (06 Marks)

### Module-5

- 9 a. Explain Digital Signature Certificates. (10 Marks)  
b. Describe the duties of Subscribers. (06 Marks)

OR

- 10 a. List any eight functions of the Controller. (08 Marks)  
b. Briefly explain Penalties and Adjudication in IT Act. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg.  $42+8=50$ , will be treated as malpractice.

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## Sixth Semester B.E. Degree Examination, June/July 2019 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Compare random scan display with raster scan display and list the applications of computer graphics. (04 Marks)
- b. What is OpenGL? With the help of block diagram explain Library organization of OpenGL program and give the general structure of OpenGL program. (04 Marks)
- c. What is DDA? With the help of a suitable example demonstrate the working principle of Bresenham's Line drawing algorithm for different slopes of a line. (08 Marks)

**OR**

- 2 a. Define the following terms with respect to computer graphics.  
i) Bitmap ii) Pixmap iii) aspect ratio iv) Frame buffer (04 Marks)
- b. List and explain various OpenGL primitive and its attribute functions. Develop an OpenGL program to create human face like structure using suitable OpenGL primitive functions. (06 Marks)
- c. With the help of a suitable example demonstrate Bresenham's circle drawing algorithm. (06 Marks)

### Module-2

- 3 a. Explain scan line polygon fill algorithm. Determine the content of the active edge table to fill the polygon with vertices A(2, 4), B(4, 6) and C(4, 1) for  $y = 1$  to  $y = 6$ . (06 Marks)
- b. Develop composite homogeneous transformation matrix to rotate an object with respect to a Pivot point. For the triangle A(3, 2) B(6,2), C(6, 6) rotate it in anticlockwise direction by 90 degree keeping A(3, 2) fixed, draw the new polygon. (06 Marks)
- c. With the help of a diagram explain shearing and reflection transformation technique. (04 Marks)

**OR**

- 4 a. Explain the data structures used by scan line polygon fill algorithm. Determine the content of active edge table to fill the polygon with vertices A(2, 4), B(2, 7), C(4, 9) and D(4, 6). (06 Marks)
- b. Give the reason to convert transformation matrix to homogeneous co-ordinate representation and show the process of conversion. Shear the polygon A(1, 1), B(3, 1), C(3, 3) D(2, 4), E(1, 3) along x-axis with a shearing factor of 0.2. (06 Marks)
- c. i) Prove that two successive 2D rotation are additive  
ii) Prove that successive scaling are multiplicative. (04 Marks)

### Module-3

- 5 a. Design a transformation matrix for window to viewport transformation. And explain how reshape function (glutReshapeFunc) works in OpenGL programming. (05 Marks)
- b. With the help of a suitable diagram explain basic 3D Geometric transformation techniques and give the transformation matrix. Explain the meaning of affine transformation. (05 Marks)
- c. With the help of OpenGL statements and diagram explain illumination and shading models. (06 Marks)

OR

- 6 a. What is Clipping? With the help of a suitable example explain Cohen-Sutherland line clipping algorithm. (06 Marks)
- b. Design transformation matrix to rotate a 3D object about an axis that is parallel to one of the co-ordinate axes. (06 Marks)
- c. With the help of a suitable diagram, explain basic illumination, RGB and CMY colour models. (04 Marks)

**Module-4**

- 7 a. What is 3D viewing? With the help of a block diagram, explain 3D viewing pipeline architecture. (04 Marks)
- b. Design the transformation matrix for orthogonal and perspective projections. (06 Marks)
- c. Explain Depth buffer method and give the OpenGL visibility detection functions. (06 Marks)

OR

- 8 a. Explain the steps for transformation from world to viewing coordinate system. (04 Marks)
- b. Design the transformation matrix for perspective projection and give OpenGL 3D viewing functions. (06 Marks)
- c. Give the general classification of visible detection algorithm and explain any one algorithm in detail. (06 Marks)

**Module-5**

- 9 a. With the help of a suitable programming construct explain event driven input menu picking and Building interactive models. (08 Marks)
- b. Write a short notes on (any two)
- i) Curve and Quadric surfaces
  - ii) OpenGL curve and surface functions
  - iii) Bezier curve and surfaces. (08 Marks)

OR

- 10 a. What are display lists? Explain the steps to develop interactive models and animating interactive programs. (08 Marks)
- b. Write a short note on (any two)
- i) Logic operations (graphics)
  - ii) Input devices or clients and servers
  - iii) Bezier spline curve and OpenGL curve functions. (08 Marks)

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## Sixth Semester B.E. Degree Examination, June/July 2019 File Structures

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. What is file structures? Explain its history. (08 Marks)  
b. What are physical and logical files? Explain basic file handling operations. (08 Marks)

OR

- 2 a. How data is organized in CD-ROM? Explain strength and weakness of CD-ROM. (08 Marks)  
b. Briefly explain field and record structures. (08 Marks)

### Module-2

- 3 a. What is data compression? Explain different compression techniques. (08 Marks)  
b. Briefly explain reclaiming spaces in files. (08 Marks)

OR

- 4 a. What is key sorting? Explain with example. (08 Marks)  
b. What is index? What are the operations required to maintain an index file? (08 Marks)

### Module-3

- 5 a. What is co-sequential processing? Explain matching and merging. (08 Marks)  
b. Explain sorting large files on disk. (08 Marks)

OR

- 6 a. What is B-tree? Explain worst case search depth. (08 Marks)  
b. With example, explain deletion, merging and redistribution in B-trees. (08 Marks)

### Module-4

- 7 a. What is indexed sequential access? With example explain maintaining a sequence set. (08 Marks)  
b. What is simple prefix B+ tree? Explain with example. (08 Marks)

OR

- 8 a. Give the internal structure of index set block. (08 Marks)  
b. Compare and contrast B, B+ and prefix B+ trees. (08 Marks)

### Module-5

- 9 a. What is hashing? Explain different hashing methods. (08 Marks)  
b. What is collision? Explain collision resolution by progressive overflow. (08 Marks)

OR

- 10 a. Explain the working of extendible hashing. (08 Marks)  
b. Briefly explain linear hashing. (08 Marks)

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15CS63

## Sixth Semester B.E. Degree Examination, June/July 2019 System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Explain SIC/XE architecture. (08 Marks)  
b. Generate the complete object program for the following SIC/XE assembly program.

```
WRREC  START  405D
        CLEAR  X
        LDT   LENGTH
WLOOP  TD     OUTPUT
        JEQ   WLOOP
        LDCH  BUFFER, X
        WD   OUTPUT
        TIXR  T
        JLT  WLOOP
        RSUB
OUTPUT BYTE  X '05'
        END

Address of BUFFER  4033
Address of LENGTH  4036
```

Op Codes :

CLEAR – B4 ; JEQ – 30; WD – DC; JLT – 38;  
LDT – 74; LDCH – 50; TIXR – B8; RSUB – 4C.

(08 Marks)

**OR**

- 2 a. List all assembler independent and dependant features and explain program relocation. (05 Marks)  
b. Explain the data structures used in macro processor with example. (03 Marks)  
c. Explain the following macroprocessor independent features.  
i) Generation of unique lables  
ii) Keyword macro parameter. (08 Marks)

### Module-2

- 3 a. What is loader? What are the basic functions the loader has to perform? (04 marks)  
b. Develop an algorithm for bootstrap loader. (07 marks)  
c. Explain dynamic linking with suitable diagram. (05 Marks)

**OR**

- 4 a. Differentiate between a linking loader and linkage editor, with the help of suitable diagram. (08 marks)  
b. Explain different loader option commands with examples. (04 marks)  
c. Illustrate MS – DOS object module with its record types. (04 Marks)

**Module-3**

- 5 a. With the help of a diagram, explain the various phases of compiler. (08 Marks)  
 b. Explain the concept of input buffering in the lexical analysis. (04 Marks)  
 c. What design objectives, compiler optimizations must meet. (04 Marks)

**OR**

- 6 a. Write a LEX program for the tokens given below : (08 Marks)

LEXEMES	TOKEN NAME	ATTRIBUTE VALUE
Any WS	—	—
if	if	—
then	then	—
else	else	—
Any id	id	ptr to table entry
Any number	number	ptr to table entry
<	reloop	LT
<=	reloop	LE
=	reloop	EQ
< >	reloop	NE
>	reloop	GT
>=	reloop	GE

- b. Write regular definitions for unsigned numbers and draw the transition diagram for the same. (08 Marks)

**Module-4**

- 7 a. Define left recursion grammer, eliminate left recursion from the following grammer :  
 $S \rightarrow aB \mid ac \mid sd \mid se$   
 $B \rightarrow bBc \mid f$   
 $C \rightarrow g$ . (03 Marks)
- b. Consider the following context free grammer  $S \rightarrow SS + \mid SS * \mid a$  and the input string  $aa + a*$   
 i) Give LMD and RMD  
 ii) Parse tree  
 iii) Is the grammer ambiguous? Why  
 iv) Describe the language generated by the grammer  
 v) Left factor the grammer. (05 Marks)
- c. Consider the following grammer with terminals ( , [ , ) , ]  
 $S \rightarrow TS \mid [S] S \mid )S \mid \epsilon$   
 $T \rightarrow (x)$   
 $X \rightarrow TX \mid [X] X \mid \epsilon$   
 i) Construct first and follow sets  
 ii) Construct its LL(1) parsing table  
 iii) Is this grammer LL(1)? (08 marks)

OR

- 8 a. The following is ambiguous grammar

$$S \rightarrow AS \mid b$$

$$A \rightarrow SA \mid a$$

Construct for this grammar its collection of sets of LR(0) items. If we try to build an LR – parsing table for the grammar, there are certain conflicting actions what are they? Suppose we tried to use the parsing table by non deterministically choosing a possible action whenever there is a conflict, show all the possible sequences of actions on input abab\$.

(10 Marks)

- b. What are the actions of a shift – reduce parser. Design shift – reduce parser for the following grammar on the input 10201  $S \rightarrow 0 S 0 \mid 1 S 1 \mid 2$ .

(06 Marks)

Module-5

- 9 a. Consider the context free grammar given below :

$$S \rightarrow EN$$

$$E \rightarrow E + T \mid E - T \mid T$$

$$T \rightarrow T * F \mid T / F \mid F$$

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

$$N \rightarrow ;$$

i) Obtain the SDD for the above grammar

ii) Construct annotated parse tree for the input string  $5 * 6 + 7$ .

(08 Marks)

- b. Obtain the DAG for the expression, show the steps  $a + a * (b - c) + (b - c) * d$ .

(04 Marks)

- c. Translate the assignment

$$a = b * -c + b * -c$$
 into

i) Three address code

ii) Quadruples.

(04 Marks)

OR

- 10 a. Explain the issues in the design of a code generator.

(11 marks)

- b. Write the machine instructions for the following three address instructions :

i)  $b = a[i]$

ii)  $a[j] = c$

iii)  $x = *p$

iv)  $*p = y$

v) if  $x < y$  got L.

(05 Marks)

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15IS63

## Sixth Semester B.E. Degree Examination, June/July 2019 Software Testing

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. What is software testing? Why it is so important in SDLC life cycle. (03 Marks)  
b. Explain the portrays of software testing life cycle. (05 marks)  
c. List six types of faults and explain each with example. (08 Marks)

**OR**

- 2 a. Identify problem statement for a triangle with flowchart for traditional implementation. (08 Marks)  
b. Describe the GUI application currency converter and embedded device Saturn wind shield wiper with diagram. (08 Marks)

### Module-2

- 3 a. Explain the boundary value analysis and BVA robust in detail with function of two variables and show how to prepare test input sets. (08 Marks)  
b. What is mutation? Explain variation on mutation in detail. (08 Marks)

**OR**

- 4 a. Explain different types of equivalence class testing in detail. (08 marks)  
b. What is fault based testing? Define below with respect to fault based-testing :  
i) Original Program      ii) Program Location  
iii) Alternate Expression      iv) Alternate Program. (08 Marks)

### Module-3

- 5 a. What is program graph? Draw program graph for triangle pseudocode. (08 marks)  
b. Explain test execution technique test oracle in detail with neat diagram. (08 Marks)

**OR**

- 6 a. Illustrate structural testing with diagram. How to identify DD paths in the program graph? Explain with example. (08 Marks)  
b. What is scaffolding? Explain application specific scaffolding capture and replay test execution techniques. (08 Marks)

### Module-4

- 7 a. Explain any four basic principles in detail. (08 marks)  
b. Explain the dependability properties. (04 marks)  
c. Explain improving the process. (04 Marks)

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**OR**

- 8 a. Write a short note on :
- i) Quality process
  - ii) Planning and monitoring process
  - iii) Quality goals
  - iv) Risk planning. (08 Marks)
- b. Explain clean room process model and software reliability engineered testing (SRET) approach. (08 Marks)

**Module-5**

- 9 a. With a neat diagram, explain alternate life cycle – specification based model in detail. (08 Marks)
- b. In brief explain :
- i) Unit testing
  - ii) System testing
  - iii) Acceptance testing
  - iv) Usability testing. (08 Marks)

**OR**

- 10 a. Explain the call graph-based integration with the help of :
- i) Pair-wise integration (08 Marks)
  - ii) Neighborhood integration.
- b. What is regression testing? Explain code-based regression test selection and control-flow and data flow regression test selection. (08 Marks)

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15CS64

## Sixth Semester B.E. Degree Examination, June/July 2019 Operating Systems

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- Explain the role of operating system from different viewpoints. Explain the dual mode of operation of an operating system. (07 Marks)
  - Demonstrate the concept of virtual machine with an example. (05 Marks)
  - Explain the types of multiprocessing system and the types of clustering. (04 Marks)

OR

- Describe the implementation of interprocess communication using shared memory and message passing. (06 Marks)
  - Demonstrate the operations of process creation and process termination in UNIX. (06 Marks)
  - Explain the different states of a process, with a neat diagram. (04 Marks)

### Module-2

- Discuss the threading issues that come with multithreaded program. (08 Marks)
  - Illustrate how Reader's-Writer's problem can be solved by using semaphores. (08 Marks)

OR

- Calculate the average waiting time by drawing Gantt chart using FCFS (First Come First Serve), SRTF (Shortest Remaining Time First), RR (Round Robin) [ $q = 2$  ms] algorithms.

Process	Arrival time	Burst time
P <sub>1</sub>	0	9
P <sub>2</sub>	1	4
P <sub>3</sub>	2	9
P <sub>4</sub>	3	5

- Explain the Dining-Philosopher's problem using monitors. (08 Marks)

### Module-3

- Determine whether the following system is in safe state by using Banker's algorithm.

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P <sub>0</sub>	0	1	0	7	5	3	3	3	2
P <sub>1</sub>	2	0	0	3	2	2			
P <sub>2</sub>	3	0	2	9	0	2			
P <sub>3</sub>	2	1	1	2	2	2			
P <sub>4</sub>	0	0	0	4	3	3			

- If a request for P<sub>1</sub> arrives for (1 0 2), can the request be granted immediately? (09 Marks)
  - Discuss the various approaches used for deadlock recovery. (07 Marks)

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OR

- 6 a. Illustrate with example, the internal and external fragmentation problem encountered in continuous memory allocation. (07 Marks)  
b. Explain the structure of page table. (09 Marks)

**Module-4**

- 7 a. Illustrate how demand paging affects systems performance. (08 Marks)  
b. Describe the steps in handling a page fault. (08 Marks)

OR

- 8 a. Explain the various types of directory structures. (08 Marks)  
b. Describe various file allocation methods. (08 Marks)

**Module-5**

- 9 a. Explain the access matrix model of implementing protection in operating system. (07 Marks)  
b. Explain the following disk scheduling algorithm in brief with examples: (09 Marks)  
i) FCFS scheduling  
ii) SSTF scheduling  
iii) SCAN scheduling  
iv) LOOK scheduling

OR

- 10 a. Explain the components of LINUX system with a neat diagram. (08 Marks)  
b. Explain the way process is managed in LINUX platform. (08 Marks)

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15CS653

## Sixth Semester B.E. Degree Examination, June/July 2019 Operation Research

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Define operation research. List and explain the various phases of an operation research study. (08 Marks)
- b. A firm manufactures three products A, B and C. The profits per unit product are Rs.3, Rs.2 and Rs.4 respectively. The firm has two machines and the required processing time in minutes for each machine on each product is given below :

Machine	Product		
	A	B	C
X	4	3	5
Y	2	2	4

Machines X and Y have 2000 and 1500 machine-minutes respectively. The firm must manufacture 100A's, 200B's and 50C's but not more than 150A's. Set up an LP model to maximize the profit. (08 Marks)

OR

- 2 a. Use the graphical method to solve the following LPP :  
Maximize  $Z = x + 0.5y$   
Subject to constraints  $3x + 2y \leq 12$   
 $5x \leq 10$   
 $x + y \leq 18$   
 $-x + y \geq 4$   
where  $x, y \geq 0$ . (12 Marks)
- b. Define : i) Feasible solution ii) unbounded solution iii) Feasible region iv) Optimal solution. (04 Marks)

### Module-2

- 3 a. Find all the basic solutions of the following problem :  
Maximize  $Z = x_1 + 3x_2 + 3x_3$   
Subject to constraints  $x_1 + 2x_2 + 3x_3 = 4$   
 $2x_1 + 3x_2 + 5x_3 = 7$   
Also find which of the basic solution are :  
i) basic feasible ii) non-degenerate basic feasible iii) optimal basic feasible. (06 Marks)
- b. Solve the following LPP by Big-M method.  
Maximize  $Z = -2x_1 - x_2$   
Subject to constraints  $3x_1 + x_2 = 3$   
 $4x_1 + 3x_2 \geq 6$   
 $x_1 + 2x_2 \leq 4$   
where  $x_1, x_2 \geq 0$ . (10 Marks)

OR

- 4 a. Solve the following LPP by simplex method.

Maximize  $= 3x_1 + 2x_2$

Subject to constraints  $x_1 + x_2 \leq 4$

$x_1 - x_2 \leq 4$

and  $x_1, x_2 \geq 0$ .

(08 Marks)

- b. Solve the following LPP by two-phase simplex method.

Maximize  $z = 3x_1 - x_2$

Subject to constraints  $2x_1 + x_2 \geq 2$

$x_1 + 3x_2 \leq 2$

$x_2 \leq 4$

and  $x_1, x_2 \geq 0$

(08 Marks)

**Module-3**

- 5 a. Write applications of dual simplex method.

(06 Marks)

- b. Solve by dual simplex method the following problem :

Maximize  $z = 2x_1 + 2x_2 + 4x_3$

Subject to constraints  $2x_1 + 3x_2 + 5x_3 \geq 2$

$3x_1 + x_2 + 7x_3 \leq 3$

$x_1 + 4x_2 + 6x_3 \leq 5$

$x_1, x_2, x_3 \geq 0$ .

(10 Marks)

OR

- 6 a. Construct the dual of the problem :

i) minimize  $z = 3x_1 - 2x_2 + 4x_3$

subject to constraints  $3x_1 + 5x_2 + 4x_3 \geq 7$

$6x_1 + x_2 + 3x_3 \geq 4$

$7x_1 - 2x_2 - x_3 \leq 10$

$x_1 - 2x_2 + 5x_3 \geq 3$

$4x_1 + 7x_2 - 2x_3 \geq 2$

and  $x_1, x_2, x_3 \geq 0$ .

(05 Marks)

ii) maximize  $z = 3x_1 + 5x_2$

subject to constraints  $2x_1 + 6x_2 \leq 50$

$3x_1 + 2x_2 \leq 35$

$5x_1 - 3x_2 \leq 10$

$x_2 \leq 20$

where  $x_1, x_2 \geq 0$ .

(05 Marks)

- b. What are the advantages of duality property?

(06 Marks)

**Module-4**

- 7 a. Find the initial basic feasible solution by using North-West corner rule.

(06 Marks)

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Supply
O <sub>1</sub>	1	5	3	3	34
O <sub>2</sub>	3	3	1	2	15
O <sub>3</sub>	0	2	2	3	12
O <sub>4</sub>	2	7	2	4	19

Demand 21 25 17 17 80

- b. Find the initial basic feasible solution using Vogel's approximation method.

(10 Marks)

	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	W <sub>4</sub>	Availability
F <sub>1</sub>	19	30	50	10	7
F <sub>2</sub>	70	30	40	60	9
F <sub>3</sub>	40	8	70	20	18
Requirement	5	8	7	14	

OR

- 8 a. Solve by matrix minima method and obtain an optimal solution for the following problem:

				Available
	50	30	220	1
From	90	45	170	3
	250	200	50	4
Required	4	2	2	

(10 Marks)

- b. Solve the following assignment problem :

	J <sub>1</sub>	J <sub>2</sub>	J <sub>3</sub>	J <sub>4</sub>
A	2	10	9	7
B	15	4	14	8
C	13	14	16	11
D	3	15	13	8

(06 Marks)

**Module-5**

- 9 a. Define : i) pure strategy ii) mixed strategy iii) optimal strategy.  
 b. Solve the following game by dominance principle.

(06 Marks)

		Player B			
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>
Player A	A <sub>1</sub>	3	2	4	0
	A <sub>2</sub>	3	4	2	4
	A <sub>3</sub>	4	2	4	0
	A <sub>4</sub>	0	4	0	8

(10 Marks)

OR

- 10 a. Solve the following game by graphical method.

(06 Marks)

		Player B				
		I	II	III	IV	V
Player A	I	2	-1	5	-2	6
	II	-2	4	-3	1	0

- b. Write short notes on :  
 i) Genetic algorithm  
 ii) Tabu search algorithm.

(10 Marks)

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15CS664

Sixth Semester B.E. Degree Examination, June/July 2019

## Python Application Programming

Time: 3 hrs.

Max. Marks: 80

**Note:** Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. List the features of Python Programming Language (at least FIVE). (05 Marks)
- b. What is the role of a programmer? List two skills required to be a programmer. (05 Marks)
- c. Explain the chained and nested conditional execution statements along with syntax and flow chart. (06 Marks)

OR

- 2 a. What are Python words and sentences? Explain with an example for each. (04 Marks)
- b. Differentiate compiler and interpreter. (04 Marks)
- c. Write python programs to i) Find largest of three numbers  
ii) Check whether the given year is leap year or not with functions. (08 Marks)

### Module-2

- 3 a. With syntax, explain the finite and infinite looping constructs in python. What is the need for break and continue statements. (08 Marks)
- b. Write a Python program to generate and print prime numbers between 2 to 50. (04 Marks)
- c. What are String slices? Explain the slicing operator in Python with examples. (04 Marks)

OR

- 4 a. Write a Python program to count the number of occurrences of a given word in a file. (06 Marks)
- b. Write a Python function that takes decimal number as input and convert that to binary equivalent and return the same. (04 Marks)
- c. List any six methods associated with strings and explain each of them with an example. (06 Marks)

### Module-3

- 5 a. What are the ways of traversing a list? Explain with an example for each. (04 Marks)
- b. Differentiate Pop and Remove methods on lists. How to delete more than one element from a list. (06 Marks)
- c. Write a Python program that accepts a sentences and build dictionary with LETTERS, DIGITS , UPPER CASE , LOWER CASE as key values and their count in the sentences as values. Ex : Sentence = "VTU@123.e-Learning"  
 $d = \{ \text{"LETTERS"} : 12, \text{"DIGITS"} : 3, \text{"UPPER CASE"} : 4, \text{"LOWER CASE"} : 8 \}$ . (06 Marks)

OR

- 6 a. Compare and contrast lists and tuples. (04 Marks)
- b. Write a program to check the validity of a password read by users. The following criteria should be used to check the validity. Password should have atleast  
i) One lower case letter    ii) One digit    iii) One upper case letter  
iv) One special character from [ \$ # @ ! ]    v) Six character.  
Your program should accept a Password and check the validity using above criteria and print "valid" or "invalid" as the case may be. (08 Marks)

- c. Demonstrate i) how a dictionary items can be represented as a list of tuples.  
ii) How tuples can be used as keys in dictionaries? (04 Marks)

#### Module-4

- 7 a. What is a Class? How to define a class in Python? How to instantiate a class and how the class members are accessed? (04 Marks)  
b. Differentiate class variables and instance variables. (02 Marks)  
c. Write a Python program that uses datetime module within a class, takes a birthday as input and prints the age and the number of days , hours, minutes and seconds until the next birthday. (10 Marks)

#### OR

- 8 a. Write a program that has a class Point with attributes as X and Y co-ordinates. Create two objects of this class and find the midpoint of both the points. Add a method reflex\_x to class point, which returns a new point. Which is the reflection of the point about the x – axis.  
Ex : point (5, 10) ⇒ reflex\_x returns point (5, -10). (06 Marks)  
b. Differentiate between simple, multiple and multi – level inheritance. (06 Marks)  
c. Write a program that has a class Person , Inherit a class Student from Person which also has a class MarksAttendance. Assume the attributes for Person class as : USN, Name, dob, gender. Attributes for Student class as : Class , branch , year , MA. Attributes for MarksAttendance : Marks, Attendance. Create a student S = Student (“1AB16CS005”, “XYZ”, “18-1-90”, “M”, 85 , 98) and display the details of the student. (04 Marks)

#### Module-5

- 9 a. Demonstrate with the help of Python construct i) how to retrieve an image over HTTP.  
ii) how to retrieve web pages with urllib. (08 Marks)  
b. Compare and contrast the JavaScript object Notation (JSON) and XML. (04 Marks)  
c. What is Service – Oriented Architecture? List the advantages of the same. (04 Marks)

#### OR

- 10 a. Write a Python program that retrieve an user’s Twitter friends , Parse the returned JSON and extract some of the information about the friends. (08 Marks)  
b. Create a simple spidering program that will go through Twitter accounts and build a database of them. (08 Marks)

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