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15CS61

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Cryptography, Network Security and Cyber Laws

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What do you mean by cyber attack? List and explain main motives of launching cyber attacks. (08 Marks)
- b. Using Extended Euclidean algorithm find the inverse of 12 modulo 79. (08 Marks)

OR

- 2 a. Design known plain text attack to obtain the key used in the Vigenere cipher. (08 Marks)
- b. Consider a Hill cipher $m = 3$ (block size = 3) with key k shown below:

$$k = \begin{pmatrix} 25 & 3 & 7 \\ 5 & 9 & 21 \\ 11 & 8 & 13 \end{pmatrix}$$

- (i) What is the cipher text corresponding to the plaintext = (VOW)?
- (ii) What is the plain text corresponding to the ciphertext = (TQX)? (08 Marks)

Module-2

- 3 a. List and explain RSA operations. (08 Marks)
- b. The modulus in a toy implementation of RSA is 143
 - (i) What is the smallest value of a valid encryption key and the corresponding decryption key?
 - (ii) For the computed encryption key and plaintext = 127, what is the corresponding ciphertext? (08 Marks)

OR

- 4 a. In what way are the properties of the cryptographic hash – the one way property and collision resistance relevant to the security provided by the MAC? Explain. (08 Marks)
- b. Consider the digital signature created using the Signer's private key operation but without the hash function i.e., $\text{sign}(m) = E_{A,pr}(m)$. Demonstrate how a forged signature may be created using this definition of a digital signature. (08 Marks)

Module-3

- 5 a. What do you mean key management? Explain the fields of an X.509 certificate. (06 Marks)
- b. List and explain PKI Architectures. (06 Marks)
- c. Define Dictionary Attacks. Explain Attack types. (04 Marks)

OR

- 6 a. Design the Needham – Schroeder protocol. (06 Marks)
- b. Define Kerberos. Explain Kerberos message sequence. (05 Marks)
- c. Explain SSL Record Layer Protocol. (05 Marks)

Module-4

- 7 a. Explain how each key in 802.11i was derived and where it is used. (06 Marks)
b. Define Firewall. List and explain main functions of a firewall. (06 Marks)
c. Classify Intrusion Detection Systems based on their functionality. (04 Marks)

OR

- 8 a. What is the role of a Bloom Filter in packet logging? (04 Marks)
b. Define SOAP. Explain SOAP messages in HTTP packets. (08 Marks)
c. Demonstrate WS-Trust relationship between entities involved in international trade. (04 Marks)

Module-5

- 9 a. List and explain IT act aim and objectives. (04 Marks)
b. Explain (i) Secure electronic record (ii) Secure digital signature (04 Marks)
c. List and explain Functions of a controller. (08 Marks)

OR

- 10 a. List and explain offences with reference to computer system. (06 Marks)
b. When network service providers not to be liable under IT Act? Explain. (04 Marks)
c. What are miscellaneous provisions of IT Act? Explain. (06 Marks)

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15CS62

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Describe various applications of computer graphics with appropriate examples. (08 Marks)
b. With a neat diagram, explain the architecture of a raster display system with integrated display processor. (08 Marks)

OR

- 2 a. With necessary steps explain Bresenham's line drawing algorithm. Consider the line from (5, 5) to (13, 9), use the Bresenham's algorithm to rasterize the line. (08 Marks)
b. Explain with diagram the different Cartesian reference frames are used in the process of constructing and displaying a scene. (08 Marks)

Module-2

- 3 a. Explain with example any two algorithms used for to identify the interior area of a polygon. (06 Marks)
b. Explain with illustrations the basic 2-dimension geometric transformations used in computer graphics. (06 Marks)
c. Explain the different Open GL routines used for manipulating display window. (04 Marks)

OR

- 4 a. Explain the scan line polygon filling algorithm. And also explain the use of sorted edge table and active edge list. (08 Marks)
b. What is the need of homogeneous coordinates? Give 2-dimension homogeneous coordinate matrix for translation, rotation and scaling. (04 Marks)
c. Obtain a matrix representation for rotation of a object about a specified pivot point in 2-dimension. (04 Marks)

Module-3

- 5 a. What is clipping? Explain with example the Sutherland-Hodgman polygon clipping algorithm. (08 Marks)
b. Explain basic illumination models. (08 Marks)

OR

- 6 a. Explain RGB and CMY color models with examples. Explain the transformation between CMY and RGB color spaces. (08 Marks)
b. Obtain the matrix representation for rotation of a object about an arbitrary axis. (08 Marks)

Module-4

- 7 a. Explain the 2 classifications of visible surface detection algorithm. (04 Marks)
b. Explain with example the depth buffer algorithm used for visible surface detection. And also list the advantages and disadvantages of depth buffer algorithm. (07 Marks)
c. Bring out the differences between perspective and parallel projections. (05 Marks)

OR

- 8 a. Explain the OpenGL 3-dimensional viewing functions. (06 Marks)
b. What is projection reference point? Obtain the general and special case perspective transformation equations. (06 Marks)
c. Explain Back-face detection method with example. (04 Marks)

Module-5

- 9 a. Explain the logical classifications of input devices with examples. (06 Marks)
b. Discuss request mode, sample mode and event mode with figures. (06 Marks)
c. List the various features that a good interactive program should include. (04 Marks)

OR

- 10 a. Explain how an event driven input can be performed for a keyboard and mouse device. (06 Marks)
b. List the properties of Bezier curve. And also explain Bazier techniques of generating curves. (10 Marks)

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15CS63

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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 the various instruction formats used in SIC/XE machine. (04 Marks)
- b. Write a SIC/XE program to copy the string "COMPUTER SCIENCE ENGINEERING" from STR1 to another string STR2. (06 Marks)
- c. List the functions of Pass-1 and Pass-2 of a two pass assembler. (06 Marks)

OR

- 2 a. Write an algorithm of the Pass-1 of a two pass assembler. (08 Marks)
- b. List the various machine independent assembler features. Explain the control-sections, how the assembler converter them into object code. (08 Marks)

Module-2

- 3 a. Define Macro. Explain how Macros are defined and expanded. (07 Marks)
- b. What are the basic functions of a loader? Explain two ways of program relocation in loaders. (09 Marks)

OR

- 4 a. Explain the functions of dynamic linking with a diagram. (08 Marks)
- b. Write a note on MS-DOS linker. (08 Marks)

Module-3

- 5 a. Explain the different phases of a compiler, with an example. (09 Marks)
- b. What is input buffering in lexical analysis? List the different methods of input buffering explain any one of them. (07 Marks)

OR

- 6 a. List and explain the reasons for separating the analysis portion of a compiler into lexical and syntax analysis phases. (06 Marks)
- b. Construct the transition diagram to recognize the tokens of
i) Identifier ii) Relational operators iii) Unsigned numbers. (06 Marks)
- c. Define Tokens, patterns, lexemes. (04 Marks)

Module-4

- 7 a. What is the role of parser? Explain the different error recovery strategies. (08 Marks)
- b. Construct the LL(1) parsing table for the following productions:
 $E \rightarrow E + T/T$; $T \rightarrow T * F/F$; $F \rightarrow (E)/id$ (08 Marks)

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15CS664

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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. Explain the salient features of python. (05 Marks)
- b. Write a python program to calculate the area of square, rectangle and circle. Print the results. Take input from user. (05 Marks)
- c. What are user defined functions? How can we pass parameters in user defined functions? Explain with suitable example. (06 Marks)

OR

- 2 a. Explain the concept of conditional execution alternate execution and chained conditions with suitable examples. (06 Marks)
- b. Write a python program to create a user defined function to find maximum and minimum letter in string. Also find the length the string without using inbuilt function. (05 Marks)
- c. Explain the concept of type conversion functions and math functions in python with examples. (05 Marks)

Module-2

- 3 a. Explain the working of while loop in python with suitable example. (05 Marks)
- b. Write a python program to demonstrate counting, summing and average of elements using loops. (05 Marks)
- c. What is a string? Write a python program to demonstrate traversal through a string with a loop. Also explain the concept of string slicing. (06 Marks)

OR

- 4 a. With syntax and example code, explain the working of definite loop in python. (05 Marks)
- b. Write a python program to concatenate and compare two strings. Read the strings from user. (05 Marks)
- c. Explain fopen, fclose, fread and fwrite concepts in python with example. (06 Marks)

Module-3

- 5 a. What is a list? Explain the concept of list slicing and list traversing with example. (05 Marks)
- b. Explain the concept of comparing tuples. Describe the working of sort function with python code. (06 Marks)
- c. Write a python program to search for lines that start with 'F' followed by 2 characters, followed by 'm:'. (05 Marks)

OR

- 6 a. What is dictionary? How is it different from list? Write a python program to count occurrence of characters in a string and print the count. (06 Marks)
- b. With an example program, illustrate how to pass function arguments to list. (05 Marks)
- c. Write a python program to search lines that start with 'X' followed by any non whitespace characters, followed by ':' ending with number. Display the sum of all these number. (05 Marks)

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.

Module-4

- 7 a. Define class and object? What are programmer defined types? Explain with example. (05 Marks)
- b. Illustrate the concept of pure function with python code. (05 Marks)
- c. What is the difference between method and function? Explain the working of init method with suitable code. (06 Marks)

OR

- 8 a. Define attribute? With the help of python code, explain how functions return instance values. (06 Marks)
- b. Explain the concept of modifier with python code. (05 Marks)
- c. What is type based dispatch? Illustrate with python example. (05 Marks)

Module-5

- 9 a. Define socket? Writ a python program that makes a connection to a webservice and follows the rules of HTTP protocol to request a plain test document and display what server sends back. (06 Marks)
- b. What is XML? How is it used is python? Explain parsing of XML with example. (05 Marks)
- c. Define cursor? Explain connect, execute and close command of databases with suitable example. (05 Marks)

OR

- 10 a. Write a python code to read the file from web using urelib and retrieve the data of the file. Also compute the frequency of each word in the file. (06 Marks)
- b. What is JSON? Illustrate the concept of parsing JSON python code. (05 Marks)
- c. Explain the concept of using JOIN to retrieve data in python. (05 Marks)

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15IS62

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Define seek time, Rotational delay and Transfer time with respect to disk access. (04 Marks)
- b. Suppose we want to store a backup copy of a large file with one million 100 byte-records. If we want to store the file on 6250 bpi tape that has an interblock gap of 0.3 inches and each data block contain one 100-byte records, how much tape is needed? (04 Marks)
- c. Briefly explain journey of a byte from users data are to disk. (08 Marks)

OR

- 2 a. Discuss the different methods for organizing the records of a file. (10 Marks)
- b. What are different buffering strategies? Explain briefly. (06 Marks)

Module-2

- 3 a. Describe the limitations of binary searching and internal sorting. (08 Marks)
- b. Explain the operations required to maintain an indexed file, in detail. (08 Marks)

OR

- 4 a. Give reasons for data compression. Explain Run-length encoding algorithm with an example. (08 Marks)
- b. Describe the method to improve the secondary index structure. (08 Marks)

Module-3

- 5 a. What are the hardware-based improvements that could lead to substantial decrease in time while file merging? Explain. (08 Marks)
- b. What is redistribution? Explain redistribution during insertion and deletion of elements in B-trees. (08 Marks)

OR

- 6 a. Apply K-way merge technique for large number of lists with an example. (08 Marks)
- b. Discuss paged binary tree. What are its advantages and disadvantages? (08 Marks)

Module-4

- 7 a. With neat sketch, Discuss simple prefix B+ tree and its maintenance. (08 Marks)
- b. Explain the internal structure of index set blocks with suitable diagram. (08 Marks)

OR

- 8 a. Explain with an example adding a simple index to sequence set. (08 Marks)
- b. Define indexed sequential access. Explain block splitting and merging due to insertion and deletion in a sequence set. (08 Marks)

Module-5

- 9 a. Explain the simple hashing algorithm with example. (08 Marks)
b. Describe the process of collision resolution by progressive overflow. (08 Marks)

OR

- 10 a. Suppose that 1000 addresses are allocated to hold 500 records in a randomly hashed file, and that each address can hold one record. Compute the following values.
i) The packing density for the file.
ii) The expected number of address with no records assigned to then by hash function.
iii) The expected number of addresses with one record assigned.
iv) The expected number of overflow records, if only one record in assigned to each home address. (08 Marks)
- b. Explain, how does extendible hashing works? (08 Marks)
