Hall Ticket Number :										

R-14

Code: 4G162

II B.Tech. II Semester Supplementary Examinations December 2017

Cryptography and Network Security

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) What are active attacks? List and explain different types of active attacks. 7M

   b) Given is the following string of ciphertext which was encrypted with substitution cipher: *asvphgyt*

   The encryption rule is given as: $C = (M + K) \ mod \ 26$

   Where, *C* is the ciphertext, *M* is the plaintext and *K* is the key. We assume that the plaintext is in English. You know that the first plaintext letter is a *W*. Find the key and decrypt the message. 7M

OR

2. a) What are passive attacks? List and explain different types of passive attacks. 7M

   b) What is Buffer Overflow attack? Discuss with suitable example. 7M

UNIT–II

3. a) We use the Diffie-Hellman Key exchange with private keys *X* and *Y* and public keys $Z_1 = a^X \ mod \ p$ and $Z_2 = a^Y \ mod \ p$. We assume $p = 71$ and $a = 7$.

   1) Give two possible pairs (*X; Y*) such that the common key $K = 1$.

   2) An attacker knows that the product $Z_1 * Z_2 = 7 \ mod \ p$.

   Give two possible pairs (*X; Y*) that satisfy the attackers knowledge. 7M

   b) List and Explain the different methods for Key distribution. 7M

OR

4. a) Write the following algorithms for digital signature schemes:

   (i) A key generation algorithm

   (ii) A signing algorithm

   (iii) A verification algorithm 7M

   b) During the transmission of *C*4 (the fourth cipher block) an error in the 3rd bit occurred. How many plaintext blocks will be affected, if we are using 16-bit CFB mode for DES? Justify your answer? 7M

UNIT–III

5. a) Explain the working of PGP. Your answer should include need of PGP, working of PGP and encryption applications of PGP. 7M

   b) Discuss Kerberos authentication model with block diagram. 7M

OR

6. a) What are the different services provided by SSL protocol in network security? Explain the various phases of SSL record protocol. 7M

   b) Explain S/MIME certificate processing in brief. 7M

UNIT–IV

7. a) What are the services provided by Encapsulating Security Payload (ESP) protocol? Discuss ESP transport mode in brief. 7M

   b) Write a short note on transport layer security. 7M

OR

8. a) Discuss the IPSec Protocol with respect to following:
      i) Working of protocol
      ii) Benefits 7M

   b) Discuss the working of Security Association in brief. 7M

UNIT–V

9. a) What is the role of Intrusion Detection System in network security? List and discuss the various types of IDS based on the deployment. 7M

   b) What is trusted systems? Explain in brief the merit and demerits of trusted systems. 7M

OR

10. a) What is DMZ? What is the importance of DMZ? Where is it located? What are the different devices located in DMZ? 7M

    b) What is Intrusion? What are the different types of Intruders? Is IDS is capable to detect the viruses in the network? Justify your answer. 7M

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Hall Ticket Number :										

R-14

Code: 4G141

II B.Tech. II Semester Supplementary Examinations December 2017

Computer Organization

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Represent the decimal numbers -7.1 and -2.01 in 32-bit floating point notation (IEEE standard 754). 7M

   b) Convert the following boolean function to its canonical form: F(A, B, C, D)= π (0,1,2,4,6,12). 7M

OR

2. a) Simplify the following expressions using Boolean algebra: i) AB'+A'B'C'+A'BC ii) A'B+A(C'D+CD') 6M

   b) Represent the decimal 8264 in BCD code, excess-3 code, 2421 code and as an unsigned binary number. 8M

UNIT–II

3. a) Design a 4-bit incrementer circuit. 4M

   b) Represent the following conditional control statement by two register transfer statements with control functions: If (*P*=1) then (*R1* ←*R2)* else if (*Q*=1) then (*R1* ←*R3).* 10M

OR

4. a) What do you mean by Complex Instruction Set Computer (CISC)? Discuss relative advantages and disadvantages of such instruction set design. 6M

   b) Explain the different phases of an instruction cycle. What happens in case an instruction has some memory operands? 8M

UNIT–III

5. a) Define and differentiate between microprogrammed control unit and hardwired control unit. Point the relative pros and cons of each organization. 8M

   b) Explain about address sequencing in a microprogrammed control organization. 6M

OR

6. Assume that the control memory of a microprogrammed control unit has 4096 words with 24 bits each. Draw the block diagram for the selection for address for this control memory. Also find the i) number of bits in the control address register, ii) the number of multiplexers required and iii) number of inputs in each multiplexer. 14M

UNIT–IV

7. Multiply the two signed binary integers using the Booth's multiplication algorithm: A=100101, B=011011 14M

OR

8. a) Design a 8M X 32 memory module using memory chips of capacity 512K X 8. 6M

   b) With a flowchart, illustrate the addition and subtraction of floating point numbers. 8M

UNIT–V

9. a) What do you mean by handshaking? With neat diagrams, explain the difference between source initiated and destination initiated asynchronous data transfers. 8M

   b) What do you mean by DMA? With a neat block diagram, explain the working of this mode of data transfer. 6M

OR

10. a) Why are interleaved memory organizations very effective for pipelined and vector processors? Explain the multiple module interleaved memory organization with an example. 8M

    b) Explain how the floating point addition subtraction operation can be devised as a 4-stage pipeline. Draw the corresponding arithmetic pipeline. 6M

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Hall Ticket Number :										

R-15

Code: 5G441

II B.Tech. II Semester Regular Examinations May 2017

Database Management Systems

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT–I

1. a) What are the different types of user interface designed for database users? Discuss the main activities of each. 7M

   b) Briefly discuss about architecture of database system with diagram. 7M

OR

2. a) List four significant difference between a file processing system and a DBMS. 7M

   b) Explain various query processor components and its functions. 7M

UNIT–II

3. Draw ER diagram for the company database incorporating all the ER notations with explanation. 14M

OR

4. a) What are the steps in designing a database? 7M

   b) With examples, explain enforcing integrity constraint. 7M

UNIT–III

5. a) Write SQL statement to get a list of out-of-warranty products that have been stored more than 90 days. 7M

   b) Briefly discuss about virtual table. 7M

OR

6. a) Write SQL statement to see a listing of all rows for which the vendor code is not 21344. 7M

   b) With an example, explain trigger and its needs. 7M

UNIT–IV

7. a) Compute the closure of the following set F of functional dependencies for relation schema r (A, B, C, D, E).

   $A \rightarrow BC$

   $CD \rightarrow E$

   $B \rightarrow D$

   $E \rightarrow A$ 7M

   b) With an example, explain 1st normal form(NF). 7M

OR

8. a) Give an example of a relation schema R and a set of dependencies such that R is in BCNF but is not in 4NF. 7M

   b) With an example, explain 2nd normal form(2 NF). 7M

UNIT–V

9. a) How does a B+ tree index handle search, insert and delete? 7M

   b) With diagram, explain tree structure index. 7M

OR

10. a) Describe how search, insert and delete operations work in ISAM indexes. 7M

    b) How data organized in a hash-based index. When would you use a hash-based index? 7M

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Hall Ticket Number :										

R-14

Code: 4G441

II B.Tech. II Semester Supplementary Examinations December 2017

Database Management Systems

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Draw the architecture of DBMS and explain the functionality of each component in it? 7M

   b) Describe about the three levels of Data Abstraction? 7M

OR

2. a) Differentiate data base system and file system. Discuss the benefits of data base system applications 7M

   b) Explain relational, Network data models diagrammatically 7M

UNIT–II

3. a) Discuss various Integrity Constraints with suitable examples 7M

   b) Explain aggregation and weak entity sets with suitable examples 7M

OR

4. What is meant by logical database design? Explain with examples 14M

UNIT–III

5. a) What is a foreign key constraint? 6M

   b) What are the SQL constructs to modify the structure of tables, views and to destroy the tables and views? 8M

OR

6. a) Explain the following in SQL with examples

      i) Nested queries ii) EXISTS keyword 6M

   b) What is trigger? Explain with an example 8M

UNIT–IV

7. a) What is normalization? Discuss first and second normal forms with examples 10M

   b) Write about the Functional dependency 4M

OR

8. a) Discuss the problems caused by redundancy 7M

   b) Explain BCNF with examples 7M

UNIT–V

9. a) What are the ACID properties? Illustrate them through examples 7M

   b) Write about Transaction Serilizability 7M

OR

10. a) Explain various file organization techniques in detail 6M

    b) Discuss B+ trees with suitable examples 8M

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Hall Ticket Number :										

R-14

Code: 4GC43

II B.Tech. II Semester Supplementary Examinations December 2017

Environmental Science

(Common to CE, ME & CSE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Illustrate the scope & Importance of environmental studies 7M
   b) How does the declination of ecosystems occurs? 7M

OR

2. a) What is the scope and importance of environmental studies? 7M
   b) Describe the multidisciplinary nature of environmental studies. 7M

UNIT–II

3. a) Write about the applications of alternative energy resources 7M
   b) Write about the importance of natural resources 7M

OR

4. a) Distinguish between traditional agricultural and modern agricultural. 7M
   b) Summarize the effects of dams on forest and tribal people. 7M

UNIT–III

5. a) Write short note on sustainable development with examples. 7M
   b) Write short note on food chain and food web with examples. 7M

OR

6. a) What are the various threats leading to loss of biodiversity? 7M
   b) Discuss the various strategies of in-situ conservation of biodiversity 7M

UNIT–IV

7. a) How does the biodiversity is maintained ? 7M
   b) What are the various methods of control to reduce thermal pollution? 7M

OR

8. a) Explain about causes of marine pollution. 7M
   b) Explain about causes of noise pollution. 7M

UNIT–V

9. a) Explain about causes of air pollution. 7M
   b) What are the salient provisions of Wild life Act? 7M

OR

10 Explain the value of environment education and the role of women and environment. 14M

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Hall Ticket Number :										

R-14

Code: 4G143

II B.Tech. II Semester Supplementary Examinations December 2017

Formal Languages and Automata Theory

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Define DFA, NFA and ε-NFA. 6M

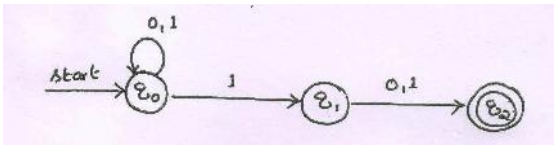
   b) Design a DFA

      i. to accept a strings of a's and b's not ending with abb.

      ii. to accept odd number of 0's and odd number of 1's. 8M

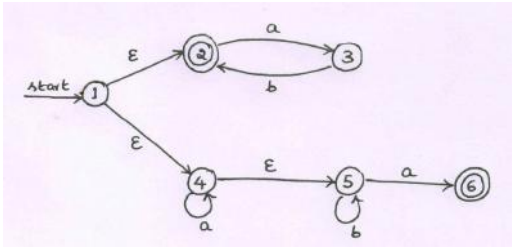
OR

2. a) Convert the following NFA and DFA.



7M

   b) Convert the following ε-NFA and DFA.



7M

UNIT–II

3. a) Define Regular Expression. Write the Regular Expressions for the following languages.

      i. $L = \{ a^n b^m \mid n \le 4, m \ge 2 \}$

      ii. Strings of 0's and 1's having no two consecutive zeros.

      iii. Strings of 0's and 1's whose lengths are multiples of 3.

      iv. Strings of a's, b's and c's such that fourth symbol from the right is a and ends with b. 10M

   b) Covert the Regular Expression (0+1)* 1 (0+1) to an ε-NFA. 4M

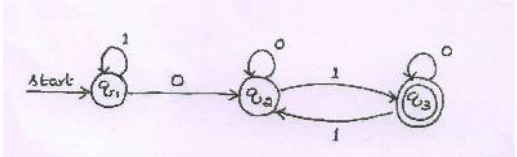
OR

4. a) Prove that the following languages are not regular.

      i. $L = \{ 0^n 1^{n+1} \mid n>0 \}$

      ii. $L = \{ a^n b^n \mid n \ge 1 \}$ 10M

   b) Find the Regular Expression from the following finite automation.



4M

UNIT–III

5. a) Construct the CFG for the following languages.
   i. $L = \{ a^{2n}b^m \mid n \geq 0, m \geq 0 \}$
   ii. $L = \{ 0^i1^j2^k \mid i = j \text{ or } j = k \}$ 6M

   b) Prove that the following grammar is ambiguous, using the string "ibtibtaea".
   $S \rightarrow iCtS \mid iCtSeS \mid a$ 8M

OR

6. a) Define the following terms, leftmost derivation, rightmost derivation, sentential form, yield of a tree with an example. 8M

   b) Convert the following grammar to CNF $S \rightarrow aSb \mid ab \mid Aa$, $A \rightarrow aab$. 6M

UNIT–IV

7. a) Define PDA. Describe the languages accepted by PDA. 5M

   b) Design PDA to accept the following language by final sate.
   $L = \{ w \mid w \varepsilon \{a.b\}^*, n_a(w) = n_b(w) \}$, show the moves made by the PDA for the string "abbaba". 9M

OR

8. a) Convert the following grammar to PDA that accepts the same language by empty stack $S \rightarrow 0S1 \mid A$, $A \rightarrow 1A0 \mid S \mid \varepsilon$ 8M

   b) Design a PDA, equivalent to the following grammar.
   $S \rightarrow AS \mid \varepsilon$, $A \rightarrow 0A1 \mid A1 \mid 01$ 6M

UNIT–V

9. a) Design a Turing machine for the language to accept the set of strings with equal number of 0's and 1's. 8M

   b) Write transition diagram and instantaneous description on the string "110100". 6M

OR

10. a) Explain
   i. Universal Turing Machine
   ii. Church's hypothesis 10M

   b) Discuss LR(0) grammar. 4M

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Hall Ticket Number :										

R-14

Code: 4G144

II B.Tech. II Semester Supplementary Examinations December 2017

Object Oriented Programming through JAVA

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) What are the features of JAVA programming language? 7M
   b) Explain various data types, scope and life time of the variables? 7M

OR

2. a) Explain constructor overloading with an example 7M
   b) Illustrate the usage of this keyword 7M

UNIT–II

3. a) What are the differences between private, static and final variables 7M
   b) What is inheritance? Explain different types of inheritances

OR

4. a) Write the differences between class and interfaces 7M
   b) What is package? How do create a package? Explain about access protection in packages? 7M

UNIT–III

5. a) Enumerate the differences between checked and unchecked exceptions in java? Explain 7M
   b) What is Synchronization? Why is thread synchronization important for Multithreaded programs 7M

OR

6. a) What is the use of throw, throws and finally keywords? Explain with examples for each. 7M
   b) Describe inter-thread communication with a suitable example 7M

UNIT–IV

7. a) Explain the applet lifecycle? What are the different types of applets 7M
   b) What are two important TCP socket classes? Explain. 7M

OR

8. a) Explain passing parameters to applets with an example 7M
   b) Explain the collection classes: Stack, StringTokenizer and Date 7M

UNIT–V

9. a) Illustrate the usage of swing buttons 7M
   b) What are the limitations of AWT? 7M

OR

10. a) What is Event delegation model? Explain it? What are the benefits of it? 7M
    b) Explain each of the methods of MouseListener 7M

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