DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech. Branch : Computer Engineering and Allied Semester :VIII

Subject Code & Name: BTCOE802 (B): Cryptography & Network Security

Max Marks: 60 Date:17/01/2024 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**What are the different modes of operation in DES? What are the weaknesses of DES?**	**Apply**	**6**
B)	**What are transposition ciphers? Explain with example.**	**Apply**	**6**
C)	**Define Cryptography and Need of it. List the Classical Cryptosystem.**	**Understand**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Differentiate between the Conventional encryption and Public-key encryption.**	**Analysis**	**6**
B)	**How is GCD calculated with Euclid's algorithm? Calculate the GCD of (270,192).**	**Apply**	**6**
C)	**Illustrate ElGamal Encryption and decryption algorithm.**	**Understand**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	**State Fermat's theorem. Find 2^{70} mod 17 using Fermat's theorem.**	**Apply**	**6**
B)	**Explain Diffie-Hellman key exchange algorithm in detail. Describe DES algorithm with neat diagram and explain the steps.**	**Understand**	**6**
C)	**Explain Knapsack cryptosystem with an example. Importance of knapsack algorithm.**	**Understand**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	**Describe about Hash Function. Explain its features & properties.**	**Understand**	**6**
B)	**Differentiate Between the SHA-1 and MD5 Algorithm.**	**Analysis**	**6**
C)	**What types of attacks are addressed by message authentication?**	**Understand**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	**What is blockchain technology? Explain the characteristics of Blockchain Technology.**	**Understand**	**6**
B)	**Explain Attribute-based Encryption algorithm with an example.**	**Apply**	**6**
C)	**Explain the operational description of PGP (Pretty Good Privacy).**	**Understand**	**6**

***** End *****

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Supplementary Winter Semester Examination – 2023

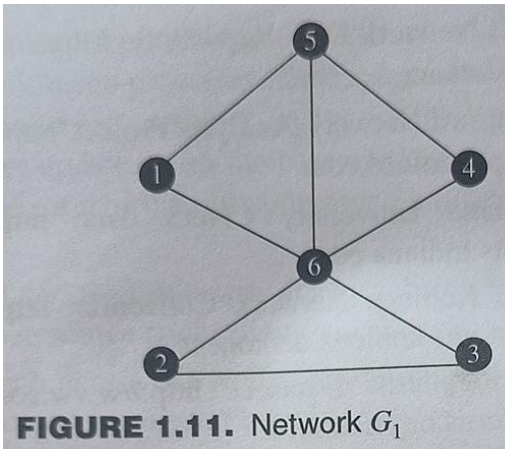
Course: B. Tech. **Branch: Computer & Allied Engineering** **Semester: VIII**

Subject Code & Name: Social Networks [BTCOE801B]

Max Marks: 60 **Date:15-01-24** **Duration: 03:00 Hrs.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Attempt the following questions.**		**[12]**
A)	Derive the adjacency matrix of G_1 in Figure 1.11. Write a short report of your observations about this adjacency matrix. Derive the adjacency list of G_1.	**Understand**	
	 **FIGURE 1.11.** Network G_1		
B)	Explain the following types of the network with suitable example: Communication Networks, Social Network, Information Networks.	**Remember**	
Q.2	**Solve any TWO Questions.**		**[12]**
A)	With suitable graph define the following terminologies: Strong Tie and Weak Tie.	**Application**	
B)	Define the term Betweenness. Explain the Girvan-Newman Method for Deleting Edges of High Betweenness.	**Understand**	
C)	For any social network website describe the three categories of links based on usage.	**Application**	
Q. 3	**Solve any TWO Questions.**		**[12]**
A)	a) Consider a class of elementary school students consisting of 9 boys and 12 girls. Suppose a social network on this group exhibits extreme gender homophily; that is, it has no cross-gender edges. Compute the maximum number of possible edges in the social network. b) Consider a set of high school students consisting of 120 girls and 80 boys. A social network on this set has a total of 1000 edges. Suppose the number of cross-gender edges in this network is exactly 40% of the value predicted by the random mixing model discussed in class. Find the number of cross-gender edges in the network	**Understand**	

B) With the help of suitable example, explain the structural balanced property, and weak structural balanced property. **Understand**

C) Explain in details the concepts of Hub and Authorities. Also Describe the updating rules for the both. **Remember**

Q.4 Attempt the following questions. **[12]**

A) Enlist the steps to create Rich-Get-Richer Models for the creation of links among Web pages. **Understand**

B) Consider the network depicted in Figure below; suppose that each node starts with the behavior B, and each node has a threshold of q = 1/2 for switching to behavior A. **Application**

(a) Now, let e and f form a two-node set S of initial adopters of behavior A. If other nodes follow the threshold rule for choosing behaviors, which nodes will eventually switch to A?

(b) Find a cluster of density greater than 1 − q = 1/2 in the part of the graph outside S that blocks behavior A from spreading to all nodes, starting from S, at threshold q.

Q. 5 Attempt the following questions. **[12]**

A) Explain in details about the Power Law. **Remember**

B) Describe the working of the Branching Process. **Remember**

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