

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, December 2024

B. Tech. (CSE), Semester VII, 2023-24

Roll No.....

CS1239: Security Engineering

Time: 2 hours

Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Mention all the assumptions for your answers clearly.

Q1.	Explain the Clark Wilson Model for information security and data integrity. What are Constrained data items (CDI) and how can the unconstrained data items (UDI) become constrained data items?	6.0 (CS1239.3)																																				
Q2.	Hospital data of patients was anonymized as it was being provided for machine learning to some students at a university. A part of this data is shown in the table below: <table><tr><th>Patient ID</th><th>Age</th><th>Gender</th><th>Zip Code</th><th>Hospital Visit Date</th><th>Procedure</th></tr><tr><td>001</td><td>49</td><td>M</td><td>302026</td><td>2023-08-10</td><td>Surgery</td></tr><tr><td>002</td><td>42</td><td>F</td><td>400011</td><td>2023-08-12</td><td>X-Ray</td></tr><tr><td>003</td><td>49</td><td>M</td><td>470001</td><td>2023-08-10</td><td>MRI</td></tr><tr><td>004</td><td>44</td><td>M</td><td>302026</td><td>2023-08-15</td><td>Surgery</td></tr><tr><td>005</td><td>34</td><td>F</td><td>462017</td><td>2024</td><td>CT scan</td></tr></table> However, their professor could correlate this data with news report in a local paper where one section read “On 1 Nov 2024, a person named Ravi underwent a medical procedure after an accident in a well-known hospital in this local area. Ravi’s father mentioned that he is born on March 14, 1975, and they live in Mahapura (zip code: 302026).” Can the Professor make an inference of hospital data by correlating with the news? What methods would you recommend for anonymization of health data records?	Patient ID	Age	Gender	Zip Code	Hospital Visit Date	Procedure	001	49	M	302026	2023-08-10	Surgery	002	42	F	400011	2023-08-12	X-Ray	003	49	M	470001	2023-08-10	MRI	004	44	M	302026	2023-08-15	Surgery	005	34	F	462017	2024	CT scan	6.0 (CS1239.4)
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Q3.	Explain the data structure of Bitcoin. How are transactions processed in the Bitcoin network, and why is the longest proof-of-work chain maintained while shorter chains are discarded? Additionally, describe how transaction transparency is ensured in the Bitcoin system.	6.0 (CS1239.5)																																				
Q. 4	Compare fingerprint and Iris Biometric with respect to advantages and disadvantages. Explain any Identification algorithm for either of the technologies Why is liveness detection of these biometrics important?	6.0 (CS1239.6)																																				

Q. 5	Explain how Meltdown attack exploits out of order execution by modern CPUs? How can Cache contents be protected from attackers in such incidents?	6.0 (CS1239.4)
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All the best!