SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT& ENGINEERING

Academic Year: 2022-2023

Program: B Tech (Integrated) Year: V Semester: X

Stream ; Computer Engineering

Subject: Operating Systems and Database Security Time: 3 hrs (2:00pm to 5:00pm)

Date: 26 /Apr/ 2023 No. of Pages: 2

Marks: 100

Final Examination

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) **In all 5 questions to be attempted.**
4) All questions carry equal marks.
5) **Answer to each new question to be started on a fresh page.**
6) **Figures in brackets on the right hand side indicate full marks.**
7) **Assume Suitable data if necessary.**

Q1		Answer briefly:	[20]
CO-1 ; SO-1 ; BL-1	a.	Describe the treat model of the Operating System	[5]
CO-2 ; SO4- ; BL-2	b.	Discuss the role of authorization module of a reference monitor in brief	[5]
CO-2 ; SO-6; BL-5	c.	Justify the importance of segment descriptor word (SDW) in the Multics system	[5]
CO-4 ; SO-1 ; BL-2	d.	Discuss in brief about any two database vulnerabilities	[5]
Q2 CO-1; SO7- ; BL-2	a.	What is Virtual Machine Lifecycle? Explain Type-I and Type-II Hypervisor in detail	[10]
CO-2; SO-4; BL-4	b.	Distinguish between Windows and Unix protection system	[10]
Q3 CO-1; SO7- ; BL-2	a.	Discuss any four security techniques for operating systems	[10]

<table>
<tr><td>CO-3; SO-6; BL-3</td><td>b.</td><td>State the need for Mandatory protection system and discuss its structure in detail</td><td>[10]</td></tr>
<tr><td>Q4
CO-2; SO-4;
BL-4</td><td>a.</td><td>Explain the categories of information flow models? Give the steps for constructing an information flow graph and for the given access matrix, draw the information flow graph.
<table><tr><th>Object → / Domain ↓</th><th>File-1</th><th>File-2</th><th>File-3</th><th>File-4</th></tr><tr><td>D1</td><td>read
write</td><td>read</td><td>read</td><td>read</td></tr><tr><td>D2</td><td>read</td><td>write</td><td>--</td><td>execute</td></tr><tr><td>D3</td><td>write</td><td>--</td><td>write</td><td>execute</td></tr></table>Access Matrix</td><td>[10]</td></tr>
<tr><td>CO-4; SO-6;
BL-4</td><td>b.</td><td>Justify the need for Database security and Explain the database security lifecycle.</td><td>[10]</td></tr>
<tr><td>Q5
CO-2; SO-4;
BL-1</td><td>a.</td><td>Explain the different models of Multics protection system in detail?</td><td>[10]</td></tr>
<tr><td>CO-4; SO-6;
BL-3</td><td>b.</td><td>Apply data risk assessment for a Cloud based Financial application by defining the scope of the application.</td><td>[10]</td></tr>
<tr><td>Q6
CO-3; SO-4;
BL-2</td><td>a.</td><td>Discuss various Windows vulnerabilities</td><td>[10]</td></tr>
<tr><td>CO-4; SO-4;
BL-2</td><td>b.</td><td>Explain Buffer Overflow attack with an example? Discuss the ways to prevent and mitigate an Buffer Overflow attack</td><td>[10]</td></tr>
<tr><td>Q7
CO-2; SO-6;
BL-4</td><td>a.</td><td>Analyze the properties of a secure operating system that satisfies reference monitor concept</td><td>[10]</td></tr>
<tr><td>CO-2; SO-4;
BL-1</td><td>b.</td><td>Write a note on Security Kernel</td><td>[10]</td></tr>
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