Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (ODD) Semester Examination September 2025

Roll no.....

Name of the Program: B.Tech(CSE) Semester: 5Th

Name of the Course: Computer System Security Course Code: TCS 591

Time: 1.5 Hour Maximum Marks: 50

Note:

(i) Answer all the questions by choosing any one of the sub questions
(ii) Each Questions carries 10 marks
(iii) Please Specify COs against each question

Q1. (1X10=10 Marks)

a. Compare **Buffer Overflow** attacks with **Integer Overflow** attacks in terms of system impact. (CO1)

OR

b. Discuss **Privilege Escalation** attacks. How do attackers typically exploit system vulnerabilities to gain Higher Privileges? Support with a relevant case study. (CO1)

Q2

(1X10=10 Marks)

a. Contrast **Sandboxing and Isolation** in the context of Security Mechanisms. (CO1)

OR

c. Illustrate with examples how **Static** analysis, **Dynamic** analysis, and **Concolic** testing help in identifying vulnerabilities. (CO1)

Q3. (1X10=10 Marks)

a. Explain **the Dirty COW (Copy-On-Write)** Vulnerability in Linux. Discuss its root cause, the mechanism of exploitation, and the potential impact on system security. Providing a real-world example of its exploitation and suggest possible mitigation strategies. (CO2)

OR

b. Compare and Contrast **Shellshock** and **Heartbleed** attacks in terms of cause, impact, and mitigation. (CO2)

Q4. (1X10=10 Marks)

a. Propose a comprehensive defense strategy to mitigate **Race conditions**, **Buffer overflow**, and **Format String Vulnerabilities** in modern systems. (CO2)

OR

b. How could an attacker Exploit the **Heartbleed vulnerability** to steal sensitive information such as Passwords or Keys. (CO2)

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Q5. (1X10=10 Marks)

a. Compare and Evaluate **Fuzzing** with other vulnerability detection techniques? (CO1)

OR

b. Critically Evaluate Defense mechanisms that can mitigate **Return-to-libc** Exploitation. (CO2)