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Roll No.: \_\_\_\_\_

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -1 EXAMINATION- September 2018  
M.Tech. I Semester

COURSE CODE: 10M1WCII31

MAX. MARKS: 15

COURSE NAME: System and Network Security Techniques

COURSE CREDITS: 3

MAX. TIME: 1 Hrs

*Note: All questions are compulsory.*

**Que.1: [Threat Model; 3 Marks; CO1]** Consider a web server. Often times, the web server's code is responsible for security e.g., checking which URLs can be accessed, checking SSL client certificates, etc. Thus, bugs in the server's code can lead to security compromises. What are the threat model and its policy? Explain by providing an example.

**Que.2: [Cryptography; 2 Marks; CO1]** An affine cipher with modulus 26 encrypts 4 as 2 and 7 as 17. Determine the key.

**Que.3: [Introduction; 2 Marks; CO1]** Discuss the market place of vulnerabilities and owned machines with respect to security engineering. Provide examples where ever is required.

**Que.4: [Control lists; 3 Marks; CO2]** Suppose the following groups are defined to shorten a system's access control lists:

- Group1: Alice, Bob, Cynthia, David, Eve
- Group2: Alice, Bob, Cynthia
- Group3: Bob, Cynthia

Suppose the access control list for File 1 is:

- File 1: Group 1, R; Group 2, RW

If Alice wants to write to File 1 giving your reasoning state whether Alice will be allowed to do so if:

- i) The first relevant entry policy is applied
- ii) The any permission in list policy is applied

Suppose the access control list for File 2 is:

- File 2: Group 3, RWE

iii) Show how the need for a Group 3 for File 2 can be removed using access none.

**Que.5: [Capability lists; 2 Marks; CO2]** Explain how capability lists are now commonly implemented in the form of attribute certificates to get around the main problem associated with the use of capability lists for access control.

**Que.6: [Access Control; 3 Marks; CO2]** The permission bits associated with a program call Prog1 and a dataset called Data1 are as follows:

Prog1: 1 1 1 1 0 1 1 0 0

Data1: 1 1 1 1 0 0 0 0 0

State the permissions these bits give. Describe the advantages and disadvantages of using permission bits for access control.