Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

DEPARTMENT OF MECHATRONICS

VI SEMESTER B.TECH. (MECHATRONICS)

END SEMESTER EXAMINATIONS, May 2022

SUBJECT: INFORMATION SECURITY FOR INDUSTRIAL AUTOMATION [MTE 4056]

(Date: May 21, 2022)

Time: 3 Hours **MAX. MARKS: 50**

Instructions to Candidates:

- Answer **ALL** the questions.

Q. No		M	CO	PO	LO	BL
1.	Prepare at least five different layers of security to protect a successful organization's operations, and explain how each layer is used.	**5**	**1**	**2**	**4**	**3, 4**
2.	Design a Pretty Good Privacy (PGP) service with the following features: authentication and compression. Describe each of the services in a design.	**3**	**2**	**3**	**5**	**6**
3.	"These types of attacks need a high degree of coordination and, therefore, may require advanced planning and a good understanding of the infrastructure of the network", justifies the assertion by choosing an appropriate hacking topology.	**2**	**4**	**2**	**2**	**5**
4.	Create a top-level format for an Encapsulating Security Payload (ESP) packet and list all of the fields that can be used.	**5**	**4**	**3**	**5**	**4, 6**
5.	"A firewall defends a local system or a network of systems against network-based security threats. There are still some limitations", according to the assertation, list at least three limitations of firewalls in terms of security threat protection.	**3**	**3**	**2**	**2**	**4**
6.	Identify the four important functions that information security performs in an organization.	**2**	**1**	**2**	**4**	**4**
7.	Create a Security Systems Development Life Cycle (SecSDLC) using the Systems Development Life Cycle (SDLC). List the steps that are unique to the SecSDLC in each phase of the SDLC.	**5**	**1**	**1**	**3**	**4, 6**
8.	Who are cybercriminals? List the groups that are most likely to be involved in cybercrime.	**3**	**4**	**2**	**4**	**1, 4**
9.	Enumerate two different ways of executing cybercrime.	**2**	**4**	**1**	**1**	**4**
10.	What is multilevel database? Write at least two proposals for multilevel security.	**5**	**4**	**2**	**4**	**1, 6**

11.	Select and explain any three categories of threat with respect to human, hardware, and software failure.	**3**	**1**	**2**	**4**	**2, 3**
12.	Select and explain any two malicious code attack vectors with respect to email and webpage infections.	**2**	**1**	**2**	**4**	**2, 3**
13.	Design a data encryption system (colour image encryption) that includes the following functionalities: colour component separation operation, bit-plane operation, bit-plane flipping operation, bit-plane shuffling operation, and bit-level column diffusion operation.	**5**	**4**	**4**	**6**	**6**
14.	Classify web security threats in terms of the location of the threat.	**3**	**2**	**1**	**1**	**4**
15.	Select and explain any four important features of IKE (Internet Key Exchange) key determination algorithm with respect to key distribution.	**2**	**4, 1, 3**	**2**	**4**	**2, 3**