

B.Sc. Semester-VI Examination, 2022-23**COMPUTER SCIENCE [Honours]**

Course ID : 61516 Course Code : SH/CSC/603/DSE-3

Course Title : Information Security

Time : 1 Hour 15 Minutes

Full Marks : 25

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.****UNIT-I**1. Answer any **five** of the following questions:

1×5=5

- What is steganography?
- What do you mean by impersonation attack?
- What is watermarking?
- What is the main difference between substitution cipher and transposition cipher?
- What is traffic padding?
- What do you mean by product cipher?
- What is the basic difference between Feistel cipher and non-Feistel cipher?
- What is proxy firewall?

*[Turn Over]***UNIT-II**2. Answer any **two** of the following questions:

5×2=10

- Explain the concepts of Confusion and Diffusion.
- Explain the working principle of Feistel Cipher.
- Explain in brief the concepts of replay attack and repudiation. Which security goal is threatened by these two attacks? (2+2)+1=5
- What is meant by IP spoofing? What is fishing?

2½+2½=5

UNIT-III3. Answer any **one** of the following questions:

10×1=10

- Describe HMAC algorithm. How does HMAC is different from other cryptographic Hash functions? 6+4=10
- What is firewall? Briefly explain possible attacks and countermeasures on a packet filtering firewall. 3+7=10

B.Sc. Semester-VI Examination, 2022-23

COMPUTER SCIENCE [Honours]

Course ID : 61516 Course Code : SH/CSC/603/DSE-3

Course Title : Introduction to Data Science

Time : 1 Hour 15 Minutes Full Marks : 25

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

UNIT-I

1. Answer any **five** of the following questions:

1×5=5

- What is Data Science?
- Write one difference between Data Science and Machine learning.
- What is likelihood?
- What is bias?
- Define PCA.
- How do you get the name of current working directory in R?
- What is linear regression?
- Name one deep learning framework.

UNIT-II

2. Answer any **two** of the following questions:

5×2=10

- Explain how to use parametric resampling to find a confidence interval for q . give pseudocode.
- What are the different ways to call a function in R?
- How can you add data set in R?
- What is p-value? And what does it indicate in the NULL Hypothesis? 2+3=5

UNIT-III

3. Answer any **one** of the following questions:

10×1=10

- In a Covid vaccine trial n_0 subjects were given a placebo and n_1 were given vaccine. x_0 of the placebo subjects developed the disease and x_1 of the vaccinated subjects. Considering the probability model $X_k \sim \text{Binomial}(n_k, p_k)$. The vaccine efficacy is defined to be $e = 1 - p_1/p_0$.
 - State the maximum likelihood estimators for p_0 and p_1 . Give a formula for the maximum likelihood estimator for e . 3
 - Explain how to compute a 95% confidence interval for e . Also explain how to test whether $e > 0.5$. 7
- Mention the types of biases that occur during sampling? What is the Confusion Matrix? Explain selection bias. 4+3+3