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

End Term (Odd) Semester Examination December 2024

Roll no...............................

Name of the Course and semester: **III**
Name of the Paper: **Fundamentals of Information Security and Blockchain**
Paper Code: **TCS 332**

Time: 3 hour

Maximum Marks: 100

Note:
- *(i)* All the questions are compulsory.
- *(ii)* Answer any two sub questions from a, b and c in each main question.
- *(iii)* Total marks for each question is 20 (twenty).
- *(iv)* Each sub-question carries 10 marks.

Q1.   (2X10=20 Marks)

a. State about the various authentication and access control techniques used in Information security

b. Explain how penetration testing is carried for a banking web site. Explain the 5 phases of the penetration testing.

c. Explain about
   1. Authentication and Authorization
   2. Three Pillars of Information Security

Q2.   (2X10=20 Marks)

a. Write the Linux commands to do the following :

   i.   To install, update, and remove software packages.
   ii. To move or rename files and directories.
   iii. To change the permissions of a file or directory
   iv. To add a new user to the system

b. Explain the output of the following commands

   i.   **userdel -r newuser**
   ii. **chmod 755 myfile.txt**
   iii. **sudo apt-get install firefox**
   iv. **cp myfile.txt MyFolder**

c. write a python program to input a name and display the number of vowels in the name

Q3.   (2X10=20 Marks)

a. What do you mean by Web Security? Explain about SQL Injection attack.

b. Explain the following terms
1. TCP 3 way handshake
2. Cross Site Scripting attack

c. Find out the Network/subnet id and broadcast id of the following

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1. 192.168.10.3   255.255.255.0
2. 172.16.205.254 255.255.0.0
3. 10.255.100.1   255.0.0.0
4. 10.255.100.1   255.255.0.0
5. 10.255.100.1   255.255.255.0

Q4.   (2X10=20 Marks)

a. Explain what do you mean by "Blockchain". Write about the three important technologies used in blockchain

b. What do you mean by "Merkle Tree " in blockchain. Explain how merkle tree is used in payment verification.

c. Explain the working of a Blockchain with an example. Clearly show the importance of the various components of a blockchain

Q5.   (2X10=20 Marks)

a. Explain the concept of "Smart Contract" in blockchain with a financial transaction example. State the advantages of smart contract.

b. What do you mean by "Consensus Algorithm" in blockchain? Explain about the various types of consensus algorithm.

c. What is "Distributed ledger" in blockchain? Explain with a suitable example.

Note For the question paper setters:
* Question paper should cover all the COs of the course.
* Please specify COs against each question.