

**B - Division B - Cybersecurity - Nov 7 SO Practice - Nov 7 Country-wide SO Practice - 11-07-2020**

**Important:** Please open all links in a new tab/window otherwise you will go out of this test.

This is Part I of the test. Before starting the test, please ensure that you have created an account at <https://www.hackerrank.com/> (<https://www.hackerrank.com/>) and are familiar with how to use it.

**1. (0.00 pts)**

Please go to <https://www.hackerrank.com/so-p-b-1604766600> (<https://www.hackerrank.com/so-p-b-1604766600>) (<https://www.hackerrank.com/so-p-b-1604766600>) to participate in the hands-on portion of the competition. Please note that for that portion, answers submitted within 50 minutes from the start of this test will be counted. Neither the answers submitted beforehand OR afterwards. Please provide the username for the answers to be **graded** answers. If you provide two or more usernames, then only the first one will be used. If a user with the username is not found, then your team will get 0 points for that portion of the competition. It is your responsibility not to share the username with anyone else. If there are two or more teams providing same username, both teams will lose the hands-on portion points.

**Expected Answer:**

**2. (2.00 pts)** Name two characteristics of a good hashing function

(Mark **ALL** correct answers)

- A) Deterministic
- B) Non-deterministic
- C) Produces fixed-length values only
- D) Accepts fixed-length input only
- E) Fast to compute

**3. (4.00 pts)** What is the MD5 of zero-length string?

**4. (1.00 pts)** Assuming 8-bits in a byte, what is the length of a hash produced using SHA-512 algorithm?

- A) 48 bytes
- B) 64 bytes
- C) 60 bytes
- D) 52 bytes
- E) 65 bytes

**5. (2.00 pts)** Which of the following hash algorithms use keys?

(Mark **ALL** correct answers)

- A) MD5

- B) MD6
- C) SHA-512
- D) HMAC

6. (6.00 pts) What is universal hashing and why would it be used?

**Expected Answer:** An algorithm chosen from a family with similar characteristics. Results in less collisions, typically avoids modular arithmetic.

7. (3.00 pts) What is "A"  $\oplus$  "Z" using 8-bit ASCII?

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8. (2.00 pts) Choose the sequence in chronological order

- A) Packet Switching, Paul Baran's proposal for distributed networks, ARPANET, Usenet
- B) Paul Baran's proposal for distributed networks, Packet Switching, ARPANET, Usenet
- C) Paul Baran's proposal for distributed networks, Usenet, Packet Switching, ARPANET
- D) Packet Switching, Paul Baran's proposal for distributed networks, ARPANET, Usenet

9. (2.00 pts) What do the HTTP and HTML stand for?

Hypertext Transfer Protocol

Hypertext Markup Language

10. (2.00 pts) Which was the first www search engine that had crawling, indexing and searching?

- A) Archie
- B) JumpStation
- C) AliWeb
- D) W3Catalog

11. (2.00 pts) Percent encode the following two strings:

my file.pdf

ab:cd

my%20file.pdf

ab%3acd

12. (2.00 pts) Please select the valid URL(s)

- A) https://mydomain.com#xyz=3?q1=2

- B) <https://username@mydomain.com>
- C) <https://user.name:dcre@mydomain.com>
- D) <https://mydomainE.com>

13. (2.00 pts) Encrypt "SCIENCEOLYMPIAD" using Caesar cypher and shift of 3

Type your letters below the corresponding given letters. Your letters can be lower or upper case.

S	C	I	E	N	C	E	O	L	Y	M	P	I	A	D
V	F	L	H	Q	F	H	R	O	B	P	S	L	D	G

14. (4.00 pts) Encode "ASTROLOGER PREDICTED THE OUTCOME" without spaces with RailFence Encoder and 2 rails.

Type your letters below the corresponding given letters. Your letters can be lower or upper case.

A	S	T	R	O	L	O	G	E	R	P	R	E	D	I	C	T	E	D	T	H	E	O	U	T	C	O	M	E
A	T	O	O	E	P	E	I	T	D	H	O	T	O	E	S	R	L	G	R	R	D	C	E	T	E	U	C	M

15. (1.00 pts) In HTTP response, are the cookies transmitted in parameters section?

- True
- False

16. (2.00 pts)

When creating cookies, what settings should be used so that these created cookies are deleted by the browser when all its tabs and windows are closed? Please note: these are **not** the browser settings.

**Expected Answer:** Don't set expires property.