Societal Impact

Standard difficulty · 20 questions · 40 marks · Time: 37 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The trail of data a person leaves while using the internet is called:
   (a) a firewall **(b)** a virus
   (c) a cookie **(d)** a digital footprint

2. A person gets into a company's server without permission and copies its files. Which cyber crime is this?
   (a) hacking **(b)** cyber trolling
   (c) identity theft **(d)** fraud email (scam)

3. Which of these is protected by a patent?
   (a) the text of a novel
   (b) a recorded song
   (c) a photograph
   (d) a new design of engine part that saves fuel

4. Which of these leaves a passive digital footprint (data collected without you meaning to share it)?
   (a) a shopping site noting the products you looked at
   (b) sending an email
   (c) filling in an online form
   (d) writing a review of a product

5. Which kind of malware changes the browser's home page and keeps showing pop-up ads?
   (a) ransomware **(b)** spyware **(c)** adware **(d)** virus

6. Which of these is licences that let creators choose which kinds of reuse they allow, such as attribution or non-commercial use?
   (a) proprietary **(b)** public domain
   (c) Creative Commons **(d)** Apache

7. Which of these is a safe practice online?
   (a) letting a public computer save your password
   (b) using your date of birth as a password
   (c) browsing on sites whose address begins with https
   (d) installing apps from unknown websites

8. A password has 4 characters, each one of the 62 letters and digits. How many different passwords are possible?
   (a) 14,776,336 **(b)** 13,845,841 **(c)** 248 **(d)** 238,328

Section B — Short answer — 8 × 2 = 16 marks

9. What is the difference between an active and a passive digital footprint?

10. Name the cyber crime in each case. (a) A student is sent hurtful messages and threats online by classmates, again and again. (b) Someone makes a fake profile with another person's name and photos and asks their friends for money.

11. Which IPR (copyright, patent or trademark) protects each? (a) a slogan that identifies a company (b) the text of a novel

12. Does each leave an active or a passive digital footprint? (a) a server logging your IP address (b) filling in an online form

13. How many different passwords of 4 characters can be made from (a) the 10 digits (0–9) (b) the 52 small and capital letters?

14. Name the kind of malware: (a) it copies itself into other programs and damages files (b) it changes the browser's home page and keeps showing pop-up ads

15. Explain why each is good net etiquette: (a) Write a clear subject line in an email. (b) Do not spam people with unwanted messages.

16. Name each: (a) a permissive licence that allows use in closed products, with a notice, and includes a patent grant (b) a copyleft licence used by much free software, giving users the right to study and change the code

Section C — Word problems — 4 × 4 = 16 marks

17. Explain intellectual property rights and the three ways they can be violated.

18. A phone is protected by a PIN of 4 digits. A program can try 500 PINs a second. (a) How many different PINs are there? (b) How many seconds would it take to try them all? (c) How many times longer would it take if the PIN had one more digit?

19. For each situation, (i) name the cyber crime and (ii) give one way to stay safe from it.
(a) Someone keeps posting provocative replies in an online forum to upset its members.
(b) An attacker on public Wi-Fi quietly reads the messages other users are sending.

20. Password A has 9 small letters. Password B has 7 characters chosen from small letters, capital letters and digits (62 in all). (a) How many passwords like A are possible? (b) How many like B? (c) Which is harder to guess, A or B?

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Answer key

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Q	Answer	Working
1	**(d) a digital footprint**	—
2	**(a) hacking**	—
3	**(d) a new design of engine part that saves fuel**	—
4	**(a) a shopping site noting the products you looked at**	—
5	**(c) adware**	—
6	**(c) Creative Commons**	—
7	**(c) browsing on sites whose address begins with https**	—
8	**(a) 14,776,336**	62 choices for each of 4 places: 62 to the power 4
9	**An active footprint is data we share on purpose (posts, emails); a passive footprint is collected without our knowing (location, cookies).**	—
10	**(a) cyber bullying (b) identity theft**	—
11	**(a) trademark (b) copyright**	—
12	**(a) passive (b) active**	—
13	**(a) 10,000; (b) 7,311,616**	10 to the power 4; 52 to the power 4
14	**(a) virus (b) adware**	—
15	**(a) it tells the reader at once what the message is about (b) it wastes their time and clogs their inbox**	—
16	**(a) Apache; (b) GPL**	—
17	**IPR are legal rights over creations of the mind (copyright, patent, trademark); violations are plagiarism, copyright infringement and trademark infringement.**	—
18	**(a) 10,000; (b) 20; (c) 10**	10 to the power 4; 10,000 ÷ 500; each extra digit gives 10 times as many PINs
19	**(a) cyber trolling; (b) eavesdropping. Safety: e.g. do not click unknown links or share passwords, use strong passwords, keep backups and software updated, report and block bullies and trolls.**	—

Q	Answer	Working
20	**(a) 5,429,503,678,976; (b) 3,521,614,606,208; (c) A**	26 to the power 9; 62 to the power 7