

## MARKING GUIDELINES

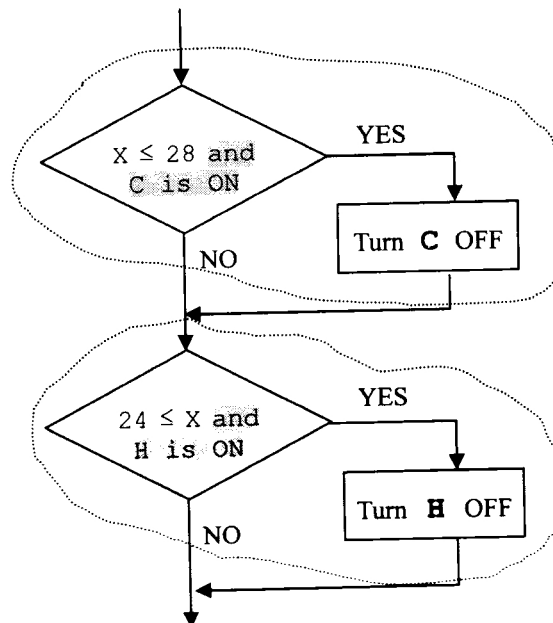
### Paper 1 (Section A)

Question No.	Key	Question No.	Key
1.	D	11.	D
2.	A	12.	B
3.	B	13.	B
4.	C	14.	B
5.	A	15.	B
6.	B	16.	C
7.	B	17.	D
8.	D	18.	A
9.	D	19.	A
10.	A	20.	A



3. (a) (i) No suitable plug-ins for the animation are installed in the browser in the computer. 1
- (ii) The content cannot be completely displayed on screen. David has to adjust the scroll bar to view the wording at the bottom. 2
- (b) Advantage: The source is more reliable. 1  
 Disadvantage: The transfer rate depends on the bandwidth allocation by the site (slower). 1  
 He may need to download the whole program again when the connection is closed during transmission.
- (c) It promotes sharing of pirated copies. 1x2  
 It increases the chance of a virus spreading.
- (d) Incoming mail server: pop3.acc.edu.hk / 210.0.168.112 1  
 Outgoing mail server: smtp.acc.edu.hk / 210.0.168.23
- (e) (i) It is easy to remember. / The college can change the server machines without notice. / DNS servers can map the server name to other hidden IP address(es) for load-balancing. 1
- (ii) There is no need to depend on DNS servers. / It saves time to look up DNS servers. 1
- (f) The mail client software cannot send mail nor receive new mail; it can only retrieve old mail in the POP3 server. 1, 1
4. (a)  $X > 32$  and C is OFF 1  
 $X < 20$  and H is OFF 1

- (b) "X ≤ 28" matches "Turn C OFF" ②  
 "24 ≤ X" matches "Turn H OFF" ②  
 YES/NO and all correct ①



optional

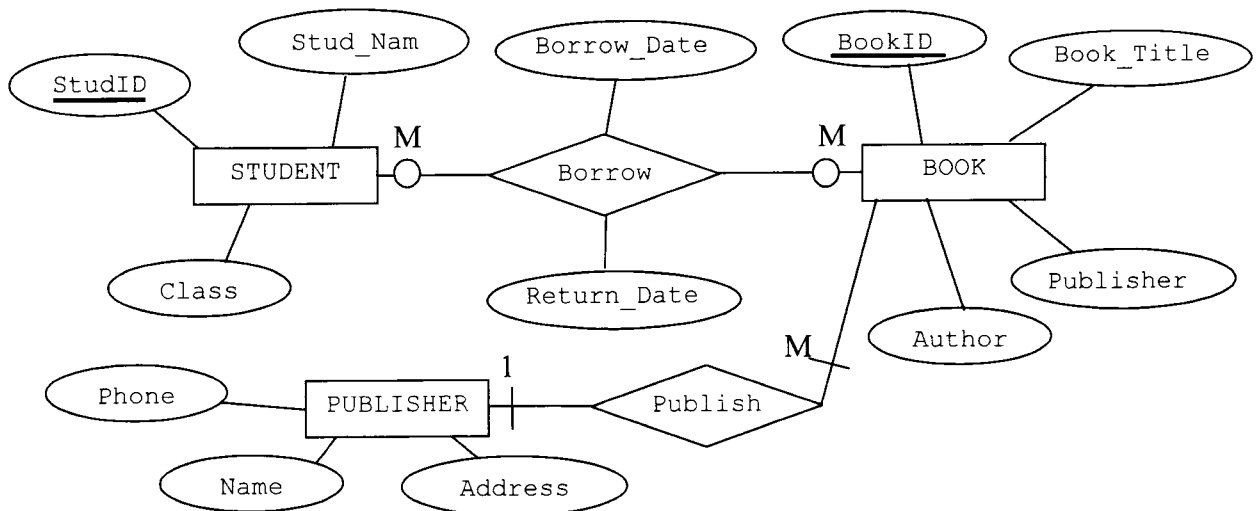
WRONG: and C/H is OFF

5. (a) (1) Produce a good posture and reduce muscle stress. 3  
 (2) Avoid bright light and reduce the visual discomfort.  
 (3) Reduce the number of keys that users would press and reduce keyboard strain.
- (b) (i) Require the users to retype the user number for verification. 1+2  
 Show the user number again to confirm.  
 Calculate the check digit to ensure correctness.  
 User number and password are entered on two different pages such that users may not confuse them.  
 Limit the length of input.  
 (other reasonable answers such as 'Data-type check' & 'saved username')
- (ii) The password is longer and includes letters of the alphabet, which is more difficult to crack. 1. 1  
 ① ①  
 (other reasonable answers such as 'more combinations' & 'more difficult to guess')
- (c) (i) Only Mary can read the email. 1
- (ii) Mary can confirm that the email was sent by Peter. 1
- (iii) Peter encrypts an email with his private key and then Mary's public key. 2  
 Mary decrypts it with her private key and then Peter's public key.  
 or  
 Peter encrypts an email with Mary's public key and then his private key.  
 Mary decrypts it with Peter's public key and then her private key.
- (Digital Certificate ①)

**Paper 2A**

**Marks**

- |        |  |                  |
|--------|--|------------------|
| 1. (a) | CREATE TABLE EXAM (<br>REG_NO CHAR(6) NOT NULL,<br>SUBJ_CODE CHAR(3) NOT NULL,<br>SCORE NUMERIC(5,1))  | 1                |
| (b)    | EXAM<br>Primary key: REG_NO + SUBJ_CODE<br>Foreign key: REG_NO, SUBJ_CODE<br>STUDENT<br>Primary key / Foreign key: REG_NO<br>SUBJECT<br>Primary key / Foreign key: SUBJ_CODE | 2<br>1<br>1<br>1 |
| (c)    | INSERT INTO SUBJECT (SUBJ_CODE, SUBJ_NAME)<br>VALUES ("ENG", "ENGLISH")  | 2                |
| (d)    | UPDATE EXAM<br>SET SCORE = SCORE + 2<br>WHERE SUBJ_CODE = "ENG"  | 2                |
| (e)    | Delete all records in STUDENT without a name entered.  | 2                |
| (f)    | Yes, EXAM may refer to the REG_NO of the student in STUDENT.   | 2                |
| 2. (a) | When a student borrows 5 books, there are 5 records in LIBRARY. However, it is not necessary for Stud_Name and Class be repeatedly stored.                                   | 2                |
| (b)    | Key attributes of entity<br>Cardinality  | 1<br>1           |



- |     |  |   |
|-----|--|---|
| (c) | STUDENT(StudID, Stud_Nam, Class)                 | 2 |
|     | BOOK(BookID, Book_Title, Author, Publisher)      | 2 |
|     | BORROW(StudID, BookID, Borrow_Date, Return_Date) | 2 |

		<b>Marks</b>
(d)	correct use of "Symbols of ER diagrams"	1
	appropriate names	1
	correct cardinality	1
(e)	A record with 5 books (bookID)	3
3. (a)	select distinct MNAME from MEM, RES where MEM.MEMID = RES.MEMID and UDATE = {21/09/03}	1 1 1
(b)	select MNAME from MEM where MNAME not in (select distinct MNAME from MEM, RES where MEM.MEMID = RES.MEMID)	1 1 1
	OR	
	select MNAME from MEM                   ①	
	where MEMID not in (select               ①	
	MEMID from RES)                         ①	
	OR	
	select MEM.MNAME from MEM               ①	
	left outer join RES on MEM.MEMID = RES.MEMID   ①	
	where FCODE is NULL                       ①	
(c)	select MNAME, sum((END - START) * RATE) as amount from RES, FAC, RES where MEM.MEMID = RES.MEMID and RES.FCODE = FAC.FCODE and month(UDATE) = 9 group by MEMID having amount > 1000 order by amount desc	1 1 1 1 1

**Marks**

(d) `select UDATE from RES where FCODE = 'S01'` 1  
`and UDATE in` 1  
`(select UDATE from RES` 1  
`where FCODE = 'S02');` 1

or

`select T1.UDATE` }  
`from RES as T1, RES as T2` } ①  
`where T1.UDATE = T2.UDATE` ①  
`and T1.FCODE = 'S01'` ①  
`and T2.FCODE = 'S02'` ①

(e) `select FCODE from FAC where left(FCODE,1) = 'Q'` 1  
`and FCODE not in (select` 1  
`FCODE from RES` 1  
`where left (FCODE,1) = 'Q' and UDATE = {21/09/03}` 1  
`and END >18 and START <21)` 1

4. (a) Kenneth should create a view for accessing TEACHER. This view should include only non-confidential fields so the clerk can verify the information without seeing the salary information. 2
- (b) Account-level is more suitable. As there are 60 teachers in the school, it is time-consuming to set table-level access right for each of these 60 accounts. Kenneth has to set the access right once only for account-level security by assigning each teacher's account to the TEACHER group. 1
- (c) (i) Yes, because (ClubID, SID) can uniquely identify a record. 1
- (ii) Yes, because it is in 1NF and (ClubName, Chairperson, Class) fully depends on the whole key, (ClubID, SID). 2
- (iii) Class is dependent on SID in such a way that it is transitively dependent on the key. 1
- (iv) CLUB(ClubID, SID) 2  
 CLUBNAME(ClubID, ClubName)  
 STUDENT(SID, Name, Class)

**Paper 2B**

	<b>Marks</b>
1. (a) (i) Share resources – hardware, software, data Communication with others	1 1
(ii) network card	1
(iii) Router Switch +description	1+1 1+1
(b) (i) No geographical limitation No time limitation	1×2
(ii) network traffic/loading type of front-end application (browser/plug-ins) security issues (login/payment) +description	6
2. (a) A peer-to-peer network is a type of network in which each workstation has equivalent capabilities and responsibilities. Peer-to-peer networks are generally simpler, but they usually do not offer the same performance under heavy loads.	2
(b) TCP/IP is a suite of communication protocols used to connect hosts on the Internet. The protocols are used by the Internet for transmitting data over networks.	2
(c) (i) Advantages: Create an e-commerce platform. Access to the latest information technology.	1 1
Disadvantages: Rely on external IT support. Increase the risk of leakage in business secrecy.	1 1
(ii) e-mail; bulletin board	2
(d) (i) client-server network advantage: Centralised control	1 1
(ii) access right, limited time/period for login	2
(iii) No, the major consideration is the common network protocol.	1



		<b>Marks</b>
3.	(a) (i) Router The router connects the company's network to the outside world.	1 1
	(ii) Hub / Switch / router (any two) Hub propagates network traffic to all its ports. Hence, the performance of the network traffic would be much less efficient than that of switch.	1×2 1
	(b) VPN connection (virtual private network) / HTTPS / SSH Advantage: high security	1×2 1
	(c) (i) A firewall is installed between "Device A" and "Internet".	1+1
	(ii) Switches for hubs	1+1
	(d) broadband and leased line The data transfer rate of broadband is not guaranteed while the other one is.	1,1 1
4.	(a) software installation, maintenance and upgrading network documentation and monitoring troubleshooting and security management	1 1 1
	(b) When a signal addressed to a particular node is sent to the bus, all nodes on the network have to examine the signal to see if it is addressed to any one of them.	1
	(c) The network administrator can use the ping command, e.g. 'ping info.gov.hk'.	1
	(d) The Domain Name System fails to resolve the domain name into its IP address.	2
	(e) An IP address has two parts: network number and host number. '202.128.227' yields the network number of a class C network while '99' yields the host number.	1 1
	(f) The passwords must be changed regularly. Try to use at least 8 alphanumeric characters including both upper case and lower case characters. Avoid using common names or personal information like birthdays and identity card numbers.	1 1 1
	(g) (i) Spyware covertly gathers user information through users' Internet connection without their knowledge. It monitors user activities on the Internet and transmits this information in the background to someone else.	2
	(ii) Adware produces sudden pop-up advertisements that are not related to the web site that is being viewed.	1

## Paper 2C

	<b>Marks</b>
1. (a) Frame (A) is a banner frame. Frame (B) is a navigation frame. Frame (C) is a content frame.	3
(b) Advantage : With frames, it is easier to navigate across web pages. Disadvantage : With frames, the workspace shown on a browser window becomes smaller.	1 1
(c) (i) Since the workspace of a browser window is small, all pictures have to be resized smaller before they can be viewed. Using lower resolution can also speed up the downloading time of the content.	2
(ii) The aspect ratio is 4:3. No, the thumbnail is not of 4:3 aspect ratio. There will be some distortion then.	1 1
(d) If the web page content is longer than the workspace, use the scroll bar to scroll down the information. The sub-heading buttons have a sorting function and they are toggle buttons. The list can be sorted in ascending or descending order by toggling the buttons.	1 1 1
(e) An email application is launched and the user can start to give his feedback through email. Use a pre-designed form to collect the feedback. When <feedback> button is pressed, jump to this form.	1 1
(f) Using his own web server, the artist can control and monitor securely the information on his web site.	1
2. (a) (i) HTML	1
(ii) HTML	1
(iii) JavaScript	1
(iv) HTML	1
(b) He has not taken into account the workspace of a web page. The viewing area in a browser window is usually smaller than 1024×768 pixels. A designer has to note the web page layout when putting objects on it.	2
(c) No. Using JavaScript can generate random numbers.	2
(d) JavaScript. Advantages : Quick response; a reduction of server's work load; an elimination of errors due to transmission.	3
(e) It is impossible for the teacher to know the performance of the students. If the teacher needs to know the performance, he should use the script on the server side to generate the web page. In addition to the answers, the web page should also collect some personal data of the students for identification purpose. After the students submit the answer, the server side checks the answers and stores the results with the personal data of the students in a database on the server side for reference.	3
(f) Advantage : It is attractive to users. Disadvantage : The browser may require suitable embedded software.	2

		<b>Marks</b>
3.	(a)	Advantage : As presentation software is commonly installed in most computers, he can design or present the demonstration. <span style="float: right;">1</span> Disadvantage : He has to design all the interim scenes manually for the transition. <span style="float: right;">1</span>
	(b) (i)	Advantage : He can show the demonstration in animated GIFs with a browser. <span style="float: right;">1</span> Disadvantage : It is hard to make minor amendments in the automatically generated interim scenes. <span style="float: right;">1</span>
	(ii)	Frame rate and time for showing the demonstration <span style="float: right;">1, 1</span>
	(iii)	The number of pixels in each scene and the colour palette used <span style="float: right;">1, 1</span>
	(c)	The teacher should use Option 2 because the viewers can see the change in morphing more clearly. <span style="float: right;">2</span>
	(d) (i)	Yes, it is because the animation cannot be shown smoothly if the frame rate is too low. <span style="float: right;">2</span>
	(ii)	No, because animation can be shown smoothly when the frame rate is about 30 frames per second. If the frame rate is too high, a large amount of resources (such as memory) are needed. <span style="float: right;">2</span>
4.	(a)	Sampling rate means the number of samples captured in the sound wave in one second. <span style="float: right;">1</span> The higher the sampling rate, the better the sound quality. <span style="float: right;">1</span>
	(b)	Sample size means the number of bits used to represent the information in a sampled datum. <span style="float: right;">1</span> The greater the sample size, the better the sound quality. <span style="float: right;">1</span>
	(c)	File size = $44100 \times 16/8 = 88200$ bytes <span style="float: right;">1</span>
	(d)	The frequency of the human voice is low, hence digitisation may involve a smaller sampling size. <span style="float: right;">2</span> The quality of the human voice need not be high, so a smaller sample size may be used.
	(e)	Advantage : Audio sounds in WAVE file format are commonly accepted by various applications. <span style="float: right;">1</span> Disadvantage : The file size is usually very large. <span style="float: right;">1</span>
	(f)	MP3 uses perceptual audio coding and psychoacoustic compression to remove all superfluous information (the redundant and irrelevant parts of a sound signal that human ear cannot hear). <span style="float: right;">1</span> The file size of MP3 file format is much smaller, about 10% of the original. <span style="float: right;">1</span> MP3 file format supports streaming. <span style="float: right;">1</span>
	(g)	The file size will become larger because the data stored in one second are larger. <span style="float: right;">1</span>
	(h)	MIDI file format <span style="float: right;">1</span> MIDI file represents sound information that includes values for the note's pitch, length, and amplitude. <span style="float: right;">1</span> During playback, a computer has to look up the actual instrument sound from a wave table.

**Paper 2D**

**Marks**

1. (a) (i) 

4	2	12	7	19	2
---	---	----	---	----	---

2
- (ii) 

12	2	4	7	19	2
----	---	---	---	----	---

2
- (iii) 

19	2	4	7	12	2
----	---	---	---	----	---

2
- (b) Swap the first element (C: A[0] ; Pascal : A[1]) and the element with index i. 2
- (c) 2 2
- (d) (i) Place the maximum number in A[0] (C) / A[1] (Pascal).  
/Find the maximum number in the list of integers. 2
- (ii) Find the maximum mark of an exam/Sorting. 1
- (e) Yes, the purpose can be achieved because the order of transversal in the array does not affect the comparisons. 2
2. (a) WS = 100 1  
RE = 1 1  
check character = A 1
- (b) (i) 

<b>[C version]</b> <table border="1" style="width: 100%;"><tr><td>N = (ch - 64) * 6 or N = (ch - 'A' + 1) * 6</td></tr></table>	N = (ch - 64) * 6 or N = (ch - 'A' + 1) * 6	<b>[Pascal version]</b> <table border="1" style="width: 100%;"><tr><td>N := (ord(ch) - 64) * 6 or N := (ord(ch) - ord('A') + 1) * 6</td></tr></table>	N := (ord(ch) - 64) * 6 or N := (ord(ch) - ord('A') + 1) * 6
N = (ch - 64) * 6 or N = (ch - 'A' + 1) * 6			
N := (ord(ch) - 64) * 6 or N := (ord(ch) - ord('A') + 1) * 6			

1+1
- (c) 

<b>[C version]</b> <table border="1" style="width: 100%;"><tr><td>r = sum % 11; if (r==0) mycheck = '0'; else if (r==1) mycheck = 'A'; else mycheck = 59-r;</td></tr></table>	r = sum % 11; if (r==0) mycheck = '0'; else if (r==1) mycheck = 'A'; else mycheck = 59-r;	<b>[Pascal version]</b> <table border="1" style="width: 100%;"><tr><td>r := sum mod 11; if r=0 then mycheck:= '0' else if r=1 then mycheck := 'A' else mycheck := chr(59-r);</td></tr></table>	r := sum mod 11; if r=0 then mycheck:= '0' else if r=1 then mycheck := 'A' else mycheck := chr(59-r);
r = sum % 11; if (r==0) mycheck = '0'; else if (r==1) mycheck = 'A'; else mycheck = 59-r;			
r := sum mod 11; if r=0 then mycheck:= '0' else if r=1 then mycheck := 'A' else mycheck := chr(59-r);			

4
- $59-r \equiv 48 + (11-r)$
- ① calculate the remainder (r)  
① r = 0  
① r = 1  
① r ≥ 2
- (d) (i) sequential search / linear search 1
- (ii) No 1+  
The nodes in the linked list cannot be directly accessed. 1
- (iii) The location of the deleted element should be kept and attached in a free list. 1

(e)

12	A78228
13	
14	W91718
15	
16	
17	
18	G84176
19	
20	X12011
21	
22	
23	

12	A78228
13	22
14	W91718
15	20
16	
17	
18	G84176
19	14
20	X12011
21	1
22	C34567
23	18

5

0.5×9 (rounding up)

3. (a)

**[Pascal version]**  
temp := A[y];  
A[y] := A[x];

**[C version]**  
temp = A[y];  
A[y] = A[x];

**[Visual Basic version]**  
temp = A(y)  
A(y) = A(x)

**[Java version]**  
temp = A[y];  
A[y] = A[x];

1×2

(b) **[Pascal version]**

x <= y  
x := x + 1;  
y := y - 1;

optional (x <> y is NOT correct.)

1×3

**[C version]**  
x <= y  
x = x + 1; or x++ or ++x  
y = y - 1; or y-- or --y

**[Visual Basic version]**  
x = x + 1  
y = y - 1

**[Java version]**  
x <= y  
x = x + 1; or x++ or ++x  
y = y - 1; or y-- or --y

**Marks**

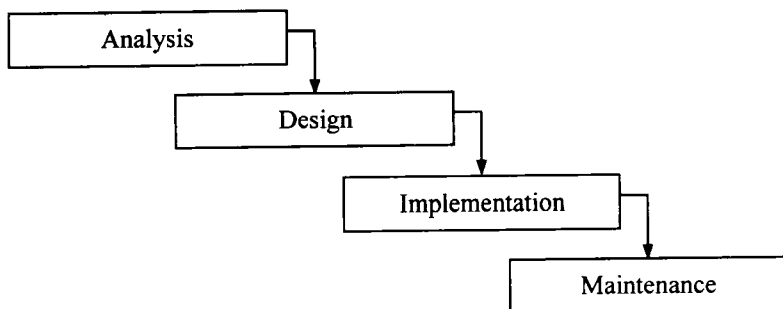
(c)	<b>[Pascal version]</b> myRev(y+1, z); myRev(x, z);	<b>Alternative:</b> myRev(x, z) myRev(x, x+z-y-1)	1×2
	<b>[C version]</b> myRev(y+1, z); myRev(x, z);		
	<b>[Visual Basic version]</b> Call myRev(y + 1, z) Call myRev(x, z)		
	<b>[Java version]</b> myRev(y+1, z); myRev(x, z);		
(d) (i)	3 4		1 1
(ii)	4 10		1 1

4. (a) (i) Documentation

1

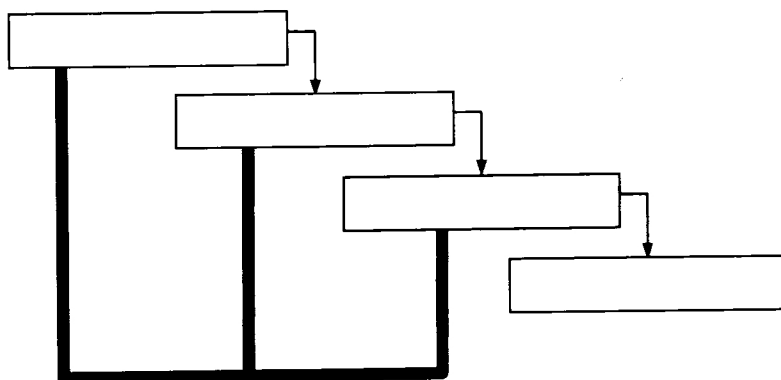
(ii)

2



(b) The existing model cannot revise backward for improvement. The modification can help to improve the development.

2



(c) Boxes A : Get book ID  
 Boxes B : Calculate late charge  
 Boxes C : Print date of return

1  
1  
1

(d) Project manager  
 System Analyst  
 (Description of the jobs that coordination rather than coding is the focus.)

1  
1  
1

(e) A = syntactic analysis  
 B = code generation  
 C = tokens

1  
1  
1

(f) (i) user training

1

(ii) system maintenance

1