Paper 2D

Marks

1. (a) (i) (1)

After first pass

X[1]	X[2]	X[3]	X[4]	X[5]	X[6]
5	2	3	1	4	6

1

After second pass

X[1]	X[2]	X[3]	X[4]	X[5]	X[6]
2	3	1	4	5	6

1

(2)

X[1]	X[2]	X[3]	X[4]	X[5]	X[6]
1	2	3	4	5	6

2

(3) 25 1

(ii) Agree. The result is the same and the algorithm becomes more efficient since fewer comparisons are involved. 1

(iii) (1) `X[ n-1 ]` or `X[ 5 ]` 1

(2) for `i` from 1 to 2 do Steps 2 to 6 2

(b) (i) (1)

X[1]
1

X[12]
12

1, 1

(ii) 12 1

(iii) If `(i<>0) and ((j=0) or (P[i] < Q[j]))`
then `X[k] ← P[i]` and `i ← i - 1`
else `X[k] ← Q[j]` and `j ← j - 1`

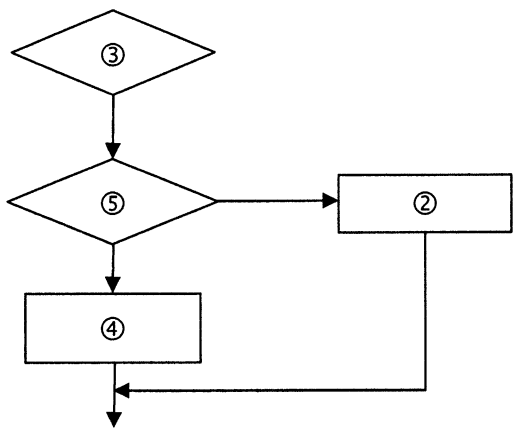
If `(j<>0) and ((i=0) or (P[i] > Q[j]))`
then `X[k] ← Q[j]` and `j ← j - 1`
else `X[k] ← P[i]` and `i ← i - 1`

3

① ( ) or ( )
② Correct conditions
③ All correct

2. (a) Compiler 1
It is because a compiler can optimize the machine code such that CAL can run faster. 1

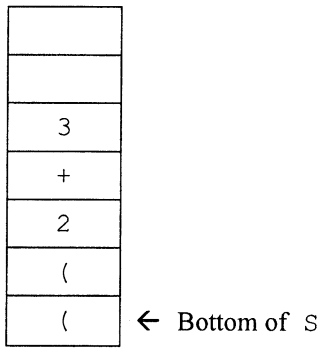
(b) 1×4



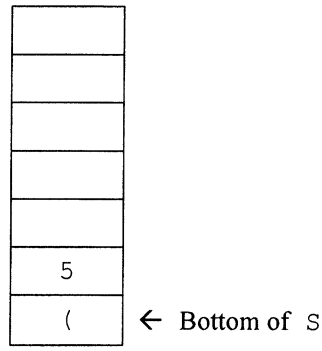
Marks

2. (c)

When `i` is changed from `5` to `6`



When `i` is changed from `6` to `7`



2, 2

(d) `5` 2

(e) Set A: valid data 1
Set B: Invalid data 1
Set C: Extreme cases / boundary cases 1

3. (a) (i) 9 1

(ii) Task 2 depends on the result of Task 1. (finish-to-start) 1

(b) A mistake may be made in testing or other stages above. 1, 1
Mr Li should check each stage one by one starting from Testing, Implementation, Design and so on. 1

(c) (i) Design 1

(ii) 1×5

Username/password	0
Auction item information	1
Biding entry	5
Create auction	3
Authentication	2
User information	4

(d) (i) 3

[Pascal version]

```
function myRAND:integer;
begin
  randomize;
  myRAND := random(1000)+1;
end;
```

[C version]

```
int myRAND() {
  srand(time(NULL));
  return rand()%1000 + 1;
}
```

[Visual Basic version]

```
FUNCTION myRAND() as Integer
  Randomize
  myRAND = 1000*RND + 1
END FUNCTION
```

[JAVA version]

```
static int myRAND() {
  Random dice = new Random();
  return = dice.nextInt(1000) + 1;
}
```

(ii) greater than 1000 1

(iii) smaller than 1000 and not a factor of 1000 1

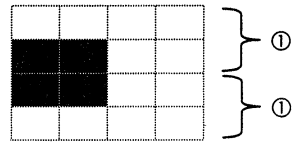
Marks

4. (a)

Method 2

0	4
1	2
0	2
1	2
0	6

Image



2

(b) (i) Best case: All are black / white pixels. 1
Worst case: Black and white pixels are alternatively located. 1

(ii) The representation is simple. / The computation is faster. 1

(c) (i) 1×5

[Pascal version]
0
P[1] / BD[1,1]
current
1
1

[Visual Basic version]
0
P(1) / BD(1,1)
current
1
1

[C version]
0
P[1] / BD[1][1]
current
1
1

[JAVA version]
0
P[1] / BD[1][1]
current
1
1

(ii) Agree. The digits are either 0 or 1 and are alternatively arranged in sequence. There is no need to store them. 2

(d) Object-oriented language: 1
A class can be written and maintained (debugged) independently of other classes. /
The details of the internal implementation can be hidden. (information hiding)
The classes can be reused. (Reusability)

Procedural language: 1
It is easy to trace the program logic / write the source code with fewer restrictions.