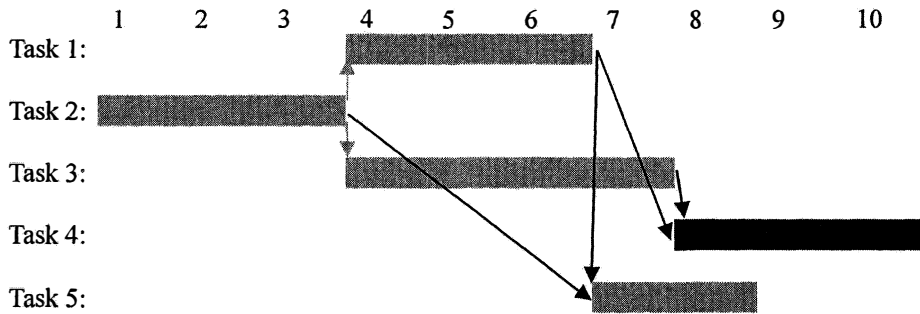


1. (a) (i)



- ① Task 4
- ① only 1 arrow correct / ② all arrows correct

(ii) Task 2 → Task 3 → Task 4

(iii) 10

(b) (i)

	1	2	3	4	5
1	F	T	F	F	F
2	F	F	F	F	F
3	F	T	F	F	F
4	T	F	T	F	F
5	T	T	F	F	F

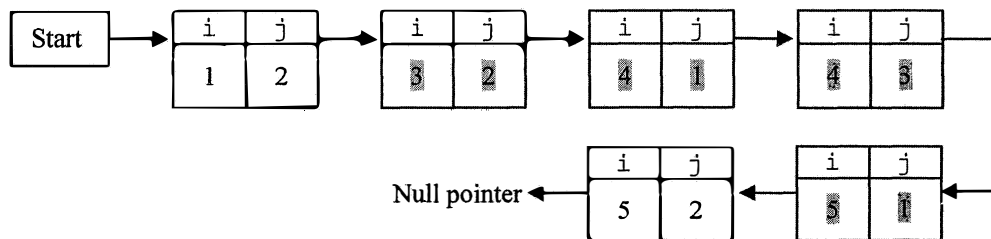
2

- ① 1 or 2 mistakes
- ② all correct

(ii) for i from 1 to 5  
 for j from 1 to 5  
 if M[i,j] = T  
 print the dependency: Task i depends on Task j

1  
1  
1

(c)



3

Note: The order of the nodes is not necessary.

- (d) (i) Users are easier to use the GUI.  
The GUI has a better outlook.
- (ii) Pointer (mouse pointer) / cursor  
Icon / window / menu / button / image

1  
1

2. (a) ① C4 1  
 ② C5 1  
 ③ C3 1  
 ④ Yes ⑤ No 1
- (b) (i) 

1	2	3	4	5	6
3	8	5	1	4	9

 2
- (ii) 

1	2	3	4	5	6
1	3	4	5	8	9

 1
- (iii) Sorting values in A in increasing order 1
- (c) 8 2
- (d) (i) The values in array A are in increasing order and distinct. (use the example in (b) or (c) ✓) 1  
 (ii) The values in array A are in decreasing order and distinct. (use the example in (b) or (c) ✓) 1
- (e) The execution time for a compiled language is usually short than that for an interpreted language. /  
 Optimisation could be done during the compilation stage. /  
 No source code is needed. /  
 Translation can be done once only. 1x2
3. (a) (i) POP S1 1  
 PUSH S2
- (ii) POP S2 1  
 PUSH S1
- (iii) No action 1
- (b) A notification will be issued. 1  
 Alternative: Remove the bottommost element of S2  
 POP S1  
 PUSH S2
- (c) order of the three components (unit testing → system testing → acceptance testing) 1  
 use of each component 1x3
- (d) (i) Object-oriented language: C# 1  
 Non object-oriented language: Fortran 1
- (ii) Description of the following criteria: 1x3
- Scale and modularity
  - Reusability
  - Portability
  - Execution efficiency
  - Functional strengths
  - Readability
  - Utility libraries and development tools
  - End-user interaction
  - Familiarity
  - Cost

4. (a) 3 1
- (b)  $\boxed{a}$   $\boxed{b}$   $\textcircled{1}$   $\boxed{i+a-1}$   $\boxed{j+b-1}$   $\textcircled{1}$  4
- $\boxed{\text{FALSE}}$   $\textcircled{1}$
- $\boxed{\text{TRUE}}$   $\textcircled{1}$
- (c) (i)  $K = 1 + 2 + 4 + 16 = 23$  1
- (ii) 1 1  
 $y \leftarrow 1$  1  
 K + Multiple 1  
 Multiple \* 2 1
- Alternative 1:  
 0 ①  
 $y \leftarrow 1$  ①  
 K + 2^Multiple ①  
 Multiple + 1 ①
- Alternative 2:  
 $y \leftarrow 1$  ①  
 K + 2^(i-1) ③
- (d) (i) 4 1
- (ii) Calculate the K value of P and match it with the values in B2 and count the number of K values. 1, 1
- (e) (i) 24 1
- (ii) No: 2\*  
 Sorting is required before doing the binary search. / Extra memory storage is required. /  
 Binary search cannot handle multiple occurrences.  
 Hence, in general, the work done for sorting outreaches the work done for sequential search.
- Yes:  
 B2 is transformed into an array to which the binary search can be applied. Hence it increases the efficiency of the searching or pattern matching.

\* Marking criteria

- ② Illustrate a comprehensive and logical answer
- ① Illustrate a relevant answer