

Examination Instructions

This is a closed book examination.

Calculators allowed.

This is a 2 hour examination.

This examination contains two sections.

SECTION A [60 marks]

Section A contains 60 multiple choice questions. Each question is worth 1 mark.

Select the best answer(s) for each question.

SECTION B [40 marks]

Section B contains 2 questions. The first question is worth 5 marks, the second question is worth 35 marks. You are required to write an algorithm using pseudo code for both questions.

SECTION A

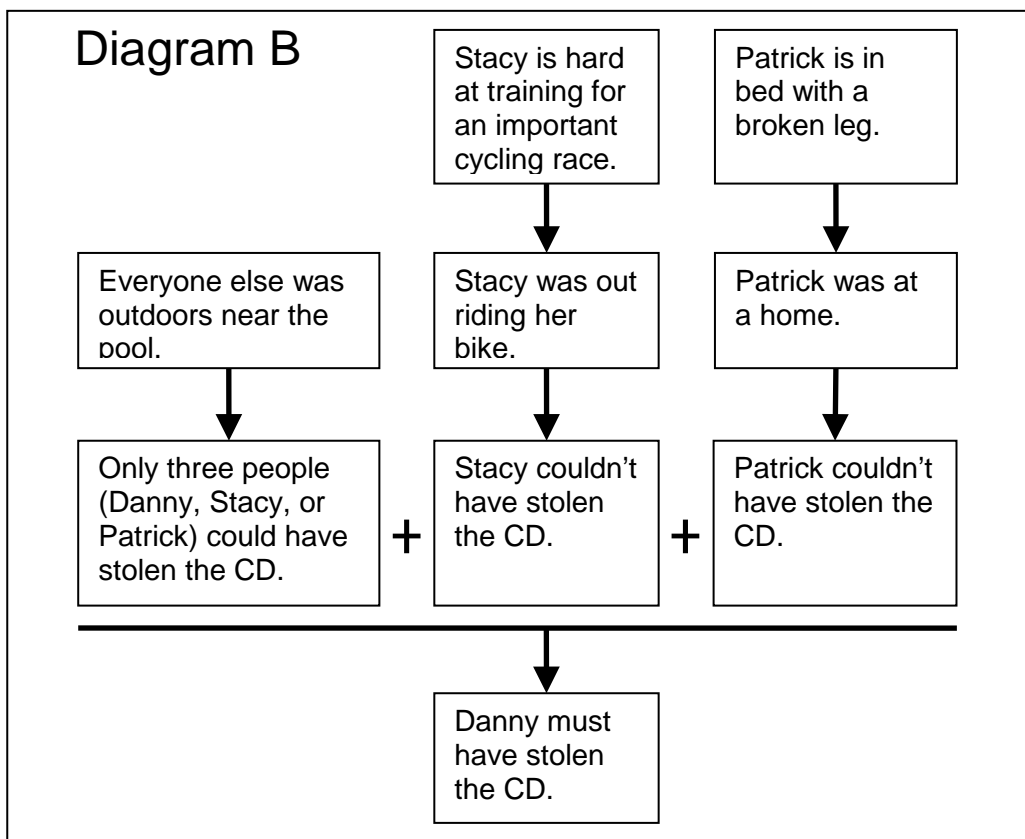
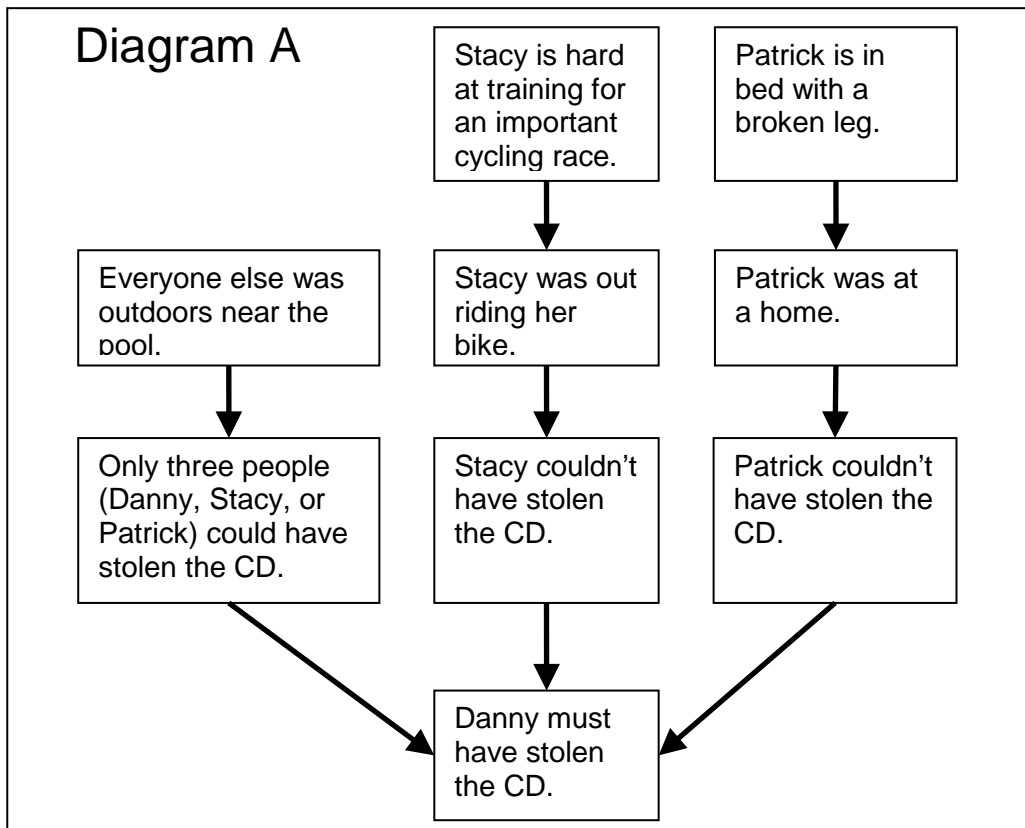
NOTE for questions 1 to 12

Use the following paragraph when answering these 12 questions. This paragraph contains a number of claims and arguments. Let's assume that these claims are true.

Only three people (Danny, Stacy, or Patrick) could have stolen the CD as everyone else was outdoors near the pool. Stacy couldn't have stolen the CD because she was out riding her bike; she is hard at training for an important cycling race. As Patrick was at home, he couldn't have stolen the CD; he is in bed with a broken leg. Therefore, Danny must have stolen the CD.

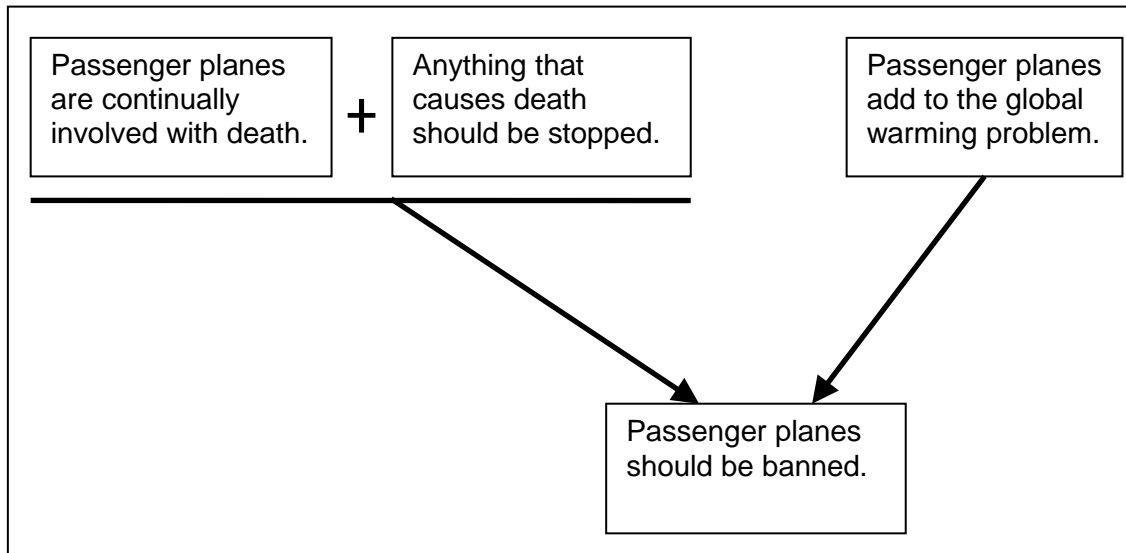
1. Which of the following is a **true claim**?
 - a) Just one person could have stolen the CD.
 - b) One of three people could have stolen the CD.
 - c) Danny, Stacy, or Patrick could have stolen the CD.
 - d) All of the above.
 - e) None of the above.
2. Which of the following is a **claim**?
 - a) Danny could have stolen the CD.
 - b) Stacy could have stolen the CD.
 - c) Patrick could have stolen the CD.
 - d) All of the above.
 - e) None of the above
3. Which of the following is a **claim**?
 - a) No one stole the CD.
 - b) Only three people (Danny, Stacy, or Patrick) could have stolen the CD.
 - c) Everyone could have stolen the CD.
 - d) All of the above.
 - e) None of the above.
4. Which of the following is a **claim**?
 - a) Stacy could have stolen the CD.
 - b) Stacy could not have stolen the CD.
 - c) Stacy couldn't have stolen the CD and she was out riding her bike.
 - d) All of the above.
 - e) None of the above.

5. Which of the following is an **argument**?
- a) As Patrick was at a home, he couldn't have stolen the CD.
 - b) Patrick couldn't have stolen the CD as he was at a home.
 - c) Patrick couldn't have stolen the CD since he was at a home.
 - d) All of the above.
 - e) None of the above.
6. Which of the following is an **argument**?
- a) Therefore, Danny must have stolen the CD.
 - b) Patrick was at a home because he is in bed with a broken leg.
 - c) Patrick is in bed with a broken leg because he was at a home.
 - d) All of the above.
 - e) None of the above.
7. Which of the following is an **argument**?
- a) Everyone else was outdoors near the pool because only three people (Danny, Stacy, or Patrick) could have stolen the CD.
 - b) Stacy is hard at training for an important cycling race as she was out riding her bike.
 - c) Patrick was at a home because he couldn't have stolen the CD.
 - d) All of the above.
 - e) None of the above.
8. Which of the following is the best **argument**?
- a) Patrick is in bed with a broken leg because he was at a home.
 - b) Patrick was at a home and in bed with a broken leg.
 - c) Patrick was at a home because he is in bed with a broken leg.
 - d) All of the above.
 - e) None of the above.
9. Which of the following is an **issue**?
- a) Did Danny steal the CD?
 - b) Stacy does not train hard enough for her important cycling race.
 - c) Patrick did not have a broken leg.
 - d) All of the above.
 - e) None of the above.
10. Which of the following is an **issue**?
- a) Where was Stacy riding her bike?
 - b) Did Stacy train hard enough for her important cycling race?
 - c) When was Patrick at home?
 - d) All of the above.
 - e) None of the above.
11. Which of the following groups of words, from the above text, indicate arguments?
- a) could, couldn't
 - b) as, because, therefore
 - c) hard, must
 - d) important, have, stolen
12. Which of the following **argument diagrams** best represent the above argument from the above paragraph?
- a) Diagram A
 - b) Diagram B



NOTE for questions 13 to 20

Use the following argument diagram when answering these 8 questions.



13. Which of the following is the **conclusion** of this argument?
 - a) Passenger planes are continually involved with death.
 - b) Anything that causes death should be stopped.
 - c) Passenger planes are continually involved with death and anything that causes death should be stopped.
 - d) Passenger planes add to the global warming problem.
 - e) Passenger planes should be banned.
14. Which of the following is a **premise** of this argument?
 - a) Passenger planes are continually involved with death.
 - b) Anything that causes death should be stopped.
 - c) Passenger planes add to the global warming problem.
 - d) Passenger planes should be banned.
15. Which of the following is a **premise** of this argument?
 - a) Passenger planes are continually involved with death.
 - b) Anything that causes death should be stopped.
 - c) Passenger planes are continually involved with death and anything that causes death should be stopped.
 - d) All of the above.
 - e) None of the above.
16. Which of the following is a **claim** of this argument?
 - a) Passenger planes are continually involved with death.
 - b) Anything that causes death should be stopped.
 - c) Passenger planes are continually involved with death and anything that causes death should be stopped.
 - d) All of the above.
 - e) None of the above.

17. Which of the following is a **claim** of this argument?
- The global warming problem.
 - Passenger planes should be banned.
 - Passenger planes should be banned because these add to the global warming problem.
 - All of the above.
 - None of the above.
18. Which of the following is an **argument** that is part of the above argument diagram?
- Because passenger planes are continually involved with death, these should be banned.
 - As anything that causes death should be stopped, passenger planes should be banned.
 - Because passenger planes are continually involved with death and anything that causes death should be stopped, passenger planes should be banned.
 - All of the above.
 - None of the above.
19. Which of the following is an **argument** that is part of the above argument diagram?
- Passenger planes add to the global warming problem. Therefore, these should be banned.
 - Passenger planes should be banned. Therefore, passenger planes add to the global warming problem.
 - Passenger planes should be banned.
 - All of the above.
 - None of the above.
20. "Anything that causes death should be stopped" is a claim from the above argument diagram. Is this claim true or false?
- TRUE
 - FALSE
21. Analyse the following statements from Jill and Jack. Is Jack addressing the issue raised by Jill? Select your answer as either a) YES or b) NO.
- Jill said "What with the number of handguns and armed robberies these days, it's hard to feel safe in your own home."
- Jack replied "The reason that you don't feel safe is that you don't have a handgun yourself. It's well known that a criminal would rather rob a house where there is no gun than a house where there is a gun."
- YES
 - NO
22. Analyse the following statements from Paul and Peter. Is Peter addressing the issue raised by Paul? Select your answer as either a) YES or b) NO.
- Paul said "This city is too cold in the winter, too hot in the summer, and too dusty all the time. I'll be happier if I exercise my early retirement and move to my place in Spain."
- Peter replied "You're nuts. You've worked here too long. You'll be miserable if you retire. Also, if you move to Spain, you'll be back in six months."
- YES
 - NO

NOTE for questions 23 to 31**Use the following pseudocode when answering these 9 questions.**

```
PRINT_STUDENT_REPORT
  PRINT 'Student Report'
  SET totalStudents TO 0
  OPEN studentFile.txt
  READ studentRecord
  DOWHILE records exist
    IF studentRecord = 'S' THEN
      ADD 1 TO totalStudents
      PRINT 'Student name: ', name
      PRINT 'Student number: ', number
      PRINT 'Enrolled Units:'
    ELSE
      IF studentRecord = 'U' THEN
        PRINT unitCode, unitName
      ELSE
        PRINT 'student record error'
      ENDIF
    ENDIF
    READ studentRecord
  ENDWHILE
  PRINT 'Total Student:' totalStudents
  CLOSE studentFile.txt
END
```

23. Consider that the above pseudo code has been refined to be rewritten into 4 modules. Which one of the following main modules is most suitable for such a refinement?

- a) PRINT_STUDENT_REPORT
PROCESSING
INITIALISATION
FINALISATION
END
- b) PRINT_STUDENT_REPORT
INITIALISATION
PROCESSING
FINALISATION
END
- c) PRINT_STUDENT_REPORT
INITIALISATION
FINALISATION
PROCESSING
END
- d) All of the above.
- e) None of the above.

24. Consider that the above pseudo code has been refined to be rewritten into 4 modules. Which one of the following groups of statements is most appropriate for placing within the INITIALISATION module?
- a) SET totalStudents TO 0
 - b) SET totalStudents TO 0
OPEN studentFile.txt
READ studentRecord
 - c) PRINT 'Student Report'
SET totalStudents TO 0
READ studentRecord
 - d) PRINT 'Student Report'
SET totalStudents TO 0
OPEN studentFile.txt
READ studentRecord
 - e) PRINT 'Student Report'
SET totalStudents TO 0
OPEN studentFile.txt
READ studentRecord
DOWHILE records exist
25. Consider that the above pseudo code has been refined to be rewritten into 4 modules. Which one of the following groups of statements is most appropriate for placing within the FINALISATION module?
- a) PRINT 'Total Student:' totalStudents
 - b) CLOSE studentFile.txt
 - c) PRINT 'Total Student:' totalStudents
CLOSE studentFile.txt
 - d) ENDWHILE
PRINT 'Total Student:' totalStudents
CLOSE studentFile.txt
 - e) ENDCASE
ENDWHILE
END
26. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. Which one of the following best represents the start of such a CASE statement?
- a) CASE totalStudents
 - b) CASE S
 - c) CASE U
 - d) CASE S or U
 - e) CASE studentRecord

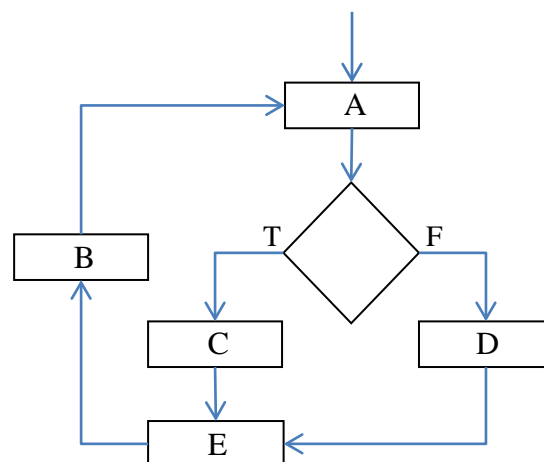
27. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. Which one of the following best represents the end of such a CASE statement?
- a) END
 - b) ENDIF
 - c) ENDWHILE
 - d) ENDCASE
 - e) OTHER
28. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. How many different kinds of cases should this CASE statement process?
- a) 0
 - b) 1
 - c) 2
 - d) 3
 - e) 4
29. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. This CASE statement must include an OTHER section. Is this true or false?
- a) TRUE
 - b) FALSE
30. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. Which one of the following group of statements is more appropriate to be placed within the 'S' case of such a CASE statement?
- a) ADD 1 TO totalStudents
 - b) ADD 1 TO totalStudents
PRINT 'Student name: ', name
 - c) ADD 1 TO totalStudents
PRINT 'Student name: ', name
PRINT 'Student number: ', number
 - d) ADD 1 TO totalStudents
PRINT 'Student name: ', name
PRINT 'Student number: ', number
PRINT 'Enrolled Units:'
 - e) ADD 1 TO totalStudents
PRINT 'Student name: ', name
PRINT 'Student number: ', number
PRINT 'Enrolled Units:'
READ studentRecord

31. Consider the IF statement in the above pseudo code has been rewritten using just one CASE statement. Which of the following CASE statements would produce the same output?

- a) CASE studentRecord
 'S': ADD 1 TO totalStudents
 PRINT 'Student name: ', name
 PRINT 'Student number: ', number
 PRINT 'Enrolled Units:'
 'U': PRINT unitCode, unitName
 OTHER: PRINT 'student record error'
ENDCASE
- b) CASE studentRecord
 'U': PRINT unitCode, unitName
 'S': ADD 1 TO totalStudents
 PRINT 'Student name: ', name
 PRINT 'Student number: ', number
 PRINT 'Enrolled Units:'
 OTHER: PRINT 'student record error'
ENDCASE
- c) CASE studentRecord
 'U': ADD 1 TO totalStudents
 PRINT 'Student name: ', name
 PRINT 'Student number: ', number
 PRINT 'Enrolled Units:'
 'S': PRINT unitCode, unitName
 OTHER: PRINT 'student record error'
ENDCASE

NOTE for questions 32 to 36

Use the following flowchart fragment when answering these 5 questions.



32. The minimum number of repetition statements required to write an algorithm for the above flowchart is _____.

- a) 1
- b) 2
- c) 3
- d) All of the above
- e) None of the above

33. The minimum number of IF statements required to write an algorithm for the above flowchart is _____.

- a) 1
- b) 2
- c) 3
- d) All of the above
- e) None of the above

34. The above flowchart _____.

- a) can be converted to an algorithm
- b) cannot be converted to an algorithm

35. The above flowchart _____.

- a) represents an algorithm that never starts
- b) represents an algorithm that never stops
- c) cannot be converted to an algorithm

36. The above flowchart _____.

- a) indicates that the statements in E will never be executed
- b) indicates that the statements in D will never be executed
- c) All of the above
- d) None of the above

37. What is printed by the following pseudocode?

```
X = 1
PRINT X
DOWHILE X < 7
    X = X + 2
    PRINT X
ENDWHILE
```

a)	b)	c)	d)
1	1	1	1
	3	3	3
	5	5	5
		7	7
			9

38. What is printed by the following pseudocode?

```
X = 1
Y = 1
PRINT X and Y
DOWHILE X < 8
    Y = X + 2
    X = Y + 1
    PRINT X and Y
ENDWHILE
```

a)	b)	c)	d)
1 1	1 1	1 1	1 1
4 3	4 3	3 4	4 3
6 5	7 6	6 7	7 5
	10 9	9 10	10 7
			13 9

39. What is printed by the following pseudocode?

```
X = 1
Y = 1
PRINT X and Y
DOWHILE X < 10
    Y = X + 2
    IF Y > 3 THEN
        X = 4
    ELSE
        X = 8
    ENDIF
    X = Y + 1
    PRINT X and Y
ENDWHILE
```

a)	b)	c)	d)
1 1	1 1	1 1	1 1
4 3	4 3	4 3	4 3
	6 5	7 6	7 6
		10 9	9 8

40. What is printed by the following pseudocode?

```
X = 1
Y = 1
PRINT X and Y
DOWHILE X < 5
    DOWHILE Y < 5
        Y = Y + 1
        PRINT X and Y
    ENDWHILE
    X = X + 1
    PRINT X and Y
ENDWHILE
```

a)	b)	c)	d)
1 1	1 1	1 1	1 1
1 2	1 2	1 2	1 2
1 3	1 3	1 3	1 3
1 4	1 4	1 4	1 4
2 5	2 5	1 5	1 5
3 6	3 6	2 1	2 5
4 7	4 7	2 2	3 5
5 8	5 8	2 3	4 5
	6 9	2 4	5 5
		2 5	
		Etc	

41. Is the following a categorical claim?
All chickens lay eggs.

- a) Yes
- b) No

42. Is the following a categorical claim?
Some birds are flightless.

- a) Yes
- b) No

43. Is the following a categorical claim?
Some cats are not dogs.

- a) Yes
- b) No

44. The subject and predicate terms of a categorical claim can be _____ .

- a) nouns
- b) adjectives
- c) verbs
- d) adverbs
- e) none of the above

45. Assume that the universe of discourse is dogs. Which one of the following claims is converse equivalent to the claim "Some black dogs are guard dogs"?

- a) Some black dogs are guard dogs.
- b) Some black dogs are not guard dogs.
- c) Some guard dogs are black dogs.
- d) Some guard dogs are not black dogs.
- e) None of the above.

46. Assume that the universe of discourse is dogs. Which one of the following claims is the obverse equivalent to the claim "Some black dogs are wild dogs"?

- a) Some black dogs are tame dogs.
- b) Some black dogs are not tame dogs.
- c) Some wild dogs are tame dogs.
- d) Some wild dogs are not tame dogs.
- e) None of the above.

47. Assume that the universe of discourse is dogs. Which one of the following claims is the contraposition equivalent to the claim "Some black dogs are wild dogs"?

- a) Some black dogs are dogs.
- b) Some black dogs are tame dogs.
- c) Some tame dogs are black dogs.
- d) Some tame dogs are not black dogs.
- e) None of the above.

48. Assume that the universe of discourse is cats and dogs. Which one of the following claims is converse equivalent to the claim "Some dogs are not cats"?
- Some dogs are cats.
 - Some dogs are not cats.
 - Some cats are dogs.
 - Some cats are not dogs.
 - None of the above.
49. Assume that the universe of discourse is cats and dogs. Which one of the following claims is the obverse equivalent to the claim "Some dogs are not cats"?
- Some dogs are cats.
 - Some dogs are not cats.
 - Some cats are dogs.
 - Some cats are not dogs.
 - None of the above.
50. Assume that the universe of discourse is cats and dogs. Which one of the following claims is the contraposition equivalent to the claim "Some dogs are cats"?
- Some dogs are cats.
 - Some dogs are not cats.
 - Some cats are dogs.
 - Some cats are not dogs.
 - None of the above.
51. Is the following argument valid?
- If it's raining, John is not riding his motorbike.
 - So, if John is not riding his motorbike, it is raining.
- Yes
 - No
52. Which of the following is the basis for the short-cut method that determines the invalidity of an argument?
- No row contains a false conclusion and true premises.
 - No row contains a true conclusion and true premises.
 - Within just one row of a truth table, if all premises are true and the conclusion is false, the argument is invalid.
 - Within just one row of a truth table, if all premises are false and the conclusion is false, the argument is invalid.
53. The _____ rule can be used to derive the conclusion of the following argument.
- If I am ill, I will visit a doctor. I will not visit a doctor.
Therefore, I am not ill.
- Modus Ponens
 - Modus Tollens
 - Chain

54. When a _____ of two claims is true; if the negation of one of these claims is true, the other claim must be _____ .
- a) disjunction, true
 - b) disjunction, false
 - c) conjunction, true
 - d) conjunction, false
 - e) none of the above
55. Which of the following claims can be derived from these two claims?
- If it's raining, I wear a raincoat.
If I wear a raincoat, I wear gloves.
- a) If I wear gloves, it's raining.
 - b) If it's raining, I wear gloves.
 - c) If I wear gloves, I wear a raincoat.
 - d) If I wear a raincoat, it's raining.
 - e) None of the above.
56. Which of the following claims can be derived from these two claims?
- It's raining.
It's windy.
- a) It's raining and it's windy.
 - b) It's raining or it's windy.
 - c) It's raining or I ate pizza for dinner.
 - d) All of the above.
 - e) None of the above.
57. Which of the following claims can be derived from these three claims?
- If it's raining, I wear a raincoat.
If it's windy, I wear a jacket.
It's raining or it's windy.
- a) I wear a raincoat.
 - b) I wear a jacket.
 - c) I wear a raincoat or I wear a jacket.
 - d) All of the above.
 - e) None of the above.
58. Which of the following claims can be derived from these two claims?
- If it's raining, I wear a raincoat.
I wear a raincoat.
- a) It's raining.
 - b) It's not raining.
 - c) I do not wear a raincoat.
 - d) If I wear a raincoat, it's raining.
 - e) None of the above.

59. Which of the following claims can be derived from this claim?

If it's raining, I wear a raincoat.

- a) It's raining.
- b) I wear a raincoat.
- c) It's raining or I wear a raincoat.
- d) It's not raining or I wear a raincoat.
- e) None of the above

60. Which of the following claims can be derived from this claim?

If it's raining, I wear a raincoat.

- a) If I wear a raincoat, it's raining.
- b) If I wear a raincoat, it's not raining.
- c) If I don't wear a raincoat, it's raining.
- d) If I don't wear a raincoat, it's not raining.
- e) None of the above.

SECTION B

1. [5 marks]

Convert the following algorithm so that the DOWHILE statement is replaced with a REPEAT ... UNTIL ... statement.

```

COMPUTE_TOTAL_PAYROLL
    totalPayroll = 0
    PRINT "Please type a payroll amount: "
    READ payrollAmount
    DOWHILE payrollAmount != EXIT
        ADD payrollAmount TO totalPayroll
        PRINT "Please type a payroll amount: "
        READ payrollAmount
    ENDDO
    PRINT "The total payroll is: ", totalPayroll
END
    
```

2. [35 marks]

This question requires you to understand some text and produce an algorithm.

Write an **algorithm** that will read a file containing many time values, one value per line. The filename is called "TIMES.TXT". For example, the following is a small set of valid and invalid time values (that could be within the input file):

```
00:00:00
07:30:00
07@30.00
de:ak:in
10:45:30
27:00:00
10:75:30
-2:00:00
12:00:00
23:59:59
24:00:00
3.14159
Elephant
```

Develop an algorithm to read such a file of hundreds of potential time values. For each time value your program must determine whether this value is valid with respect to the expected format hh:mm:ss for a 24 hour clock.

If a time value is valid, display that value. If a time value is invalid, display that time value followed by the words "error: invalid time".

For example, based on the above time data, the output of your algorithm would be:

```
00:00:00
07:30:00
07@30.00  error: invalid time
de:ak:in  error: invalid time
10:45:30
27:00:00  error: invalid time
10:75:30  error: invalid time
12:00:00
-2:00:00  error: invalid time
23:59:59
24:00:00  error: invalid time
3.14159   error: invalid time
Elephant  error: invalid time
```

NOTE - only the pseudocode algorithm will be marked in this question. You might want to develop a defining diagram to get started, but this question is all about that final algorithm.

- END OF PAPER -