

TEST 2
CS 1014
2:00-3:15 PM
SPRING 1999
Instructor: Dulal Kar

Name: _____

ID: _____

Total Points: 100

Time : 1 hour

Read carefully and follow the following exam policies:

- 1. This is a closed book exam. You are not allowed to use any books, notes, or course materials in any form.**
- 2. No calculators or computing devices are allowed.**
- 3. All work must be done by you alone.**
- 4. You are not allowed to use any scratch paper; instead, use the backsides of the sheets of the test paper.**
- 5. You are not allowed to take copies of the questions or the answers with you in any form (written, electronic, or otherwise) after the test.**
- 6. The test has all multiple-choice questions. Choose the single best answer for each question.**
- 7. You may first mark your answers on the question paper and copy them to the opscan sheet later. In any case, your answers on the opscan sheet will be considered final and official.**
- 8. Return the opscan sheet as well as the question paper before you leave the examination room.**

Note that it is an honor code violation to have a copy of this examination in your possession outside of the examination (written, electronic, or otherwise) room.

For questions 1 to 3, assume the following declarations and mark A on the opscan sheet if the logical expression in the question is .TRUE., otherwise mark B.

INTEGER :: i = 3, j = 5, k = - 3

CHARACTER (LEN = 5) :: name1 = "jack", name2="John"

1. -k > i - j + 5
2. i ** 2 /= -i * k
3. name1 > name2

For questions 4 through 7, consider the declaration

INTEGER :: j = 3, k = 2, p = 4

LOGICAL :: ok = .TRUE.

For each logical expression in questions 4 to 7, mark A on the opscan sheet if the result is .TRUE., otherwise mark B.

4. j + 2 > k + 3 .AND. ok
5. j > k .AND. k + 2 >= 6 .OR. ok
6. .NOT. ok .AND. .NOT. (k + 5 <= 5)
7. ok .AND. p == 2 .OR. k + j - 2 >= 6

For questions 8 to 10, determine how many times each DO loop will be executed? Assume, i is an integer.

8. DO i = 4, 8
a) 1 b) 4 c) 5 d) 0 e) None of them
9. DO i = -1, 6, 4
a) 0 b) 2 c) 3 d) 0 e) None of them
10. DO i = 4, -8, - 4
a) 5 b) 4 c) 3 d) 0 e) None of them

For questions 11 to 13, consider the following code:

```
INTEGER :: product = 1, i           ! Line 1
DO i = 0, 3                         ! Line 2
    product = product *(i + 1)      ! Line 3
END DO                             ! Line 4
WRITE(*,*) product                 ! Line 5
```

11. What will be output from the code segment?
a) 24 b) 6 c) 48 d) 0 e) None of them
12. What will be the output from the code segment if Line 2 is replaced by:
DO i = 0, -5, -2
a) -3 b) 3 c) 0 d) 10 e) None of them

13. What will be output from the code segment if Line 2 is replaced by:

DO i=-1, 5, 2

- a) 0 b) -10 c) -15 d) 15 e) None of them

For questions 14 to 17, consider the following code:

```
INTEGER :: i, sum = 0      ! Line 1
i = 0                     ! Line 2
DO WHILE (i < 7)           ! Line 3
    sum = sum + i          ! Line 4
    i = i + 3              ! Line 5
END DO                    ! Line 6
```

14. How many times the DO WHILE loop will be executed?

- a) 5 b) 4 c) 3 d) 0 e) None of them

15. What will be the exit or the final value of i after termination of the loop?

- a) 9 b) 6 c) 0 d) 3 e) None of them

16. What will be the value for sum at the end of execution of the code segment?

- a) 6 b) 9 c) 15 d) 10 e) None of them

17. How many times the loop will be executed if Line 5 is replaced by

i = - i - 1

- a) 0 b) infinite c) 4 d) 2 e) None of them

For questions 18 through 20, mark A on the opscan sheet if the declaration statement is legal in Fortran 90, otherwise mark B.

18. CHARACTER :: ssn (LEN=11)

19. CHARACTER (LEN=1) :: status

20. CHARACTER :: ssn*11, telephone*12

For questions 21 and 22, consider the following code:

```
CHARACTER (LEN=10) :: str1 = "Biggest", str2 = "Machine"      ! line 1
WRITE (*, *) str1(:3) // str2(:3)                               ! line 2
WRITE (*,*) INDEX(str1//str2,"M")                              ! line 3
```

21. What will be the output from line 2? (☐ indicates a space.)

- a) BiggestMachine b) BigMachine c) Big☐Mac d) BigMac
e) Biggest☐Machine f) None of them

22. What will be the output from line 3?

- a) 10 b) 11 c) 9 d) 8 e) None of them

23. The following if-else block is intended to calculate the sales commission of a salesperson as follows:
sales commission = 3% of the sales amount if sales amount is over \$50000 and the commission code is 1;
otherwise, sales commission = 2% of the sales amount.

```
IF ( _____ ) THEN
    sales_commission = 0.03 * sales_amount      ! sales commission is 3% of sales amount
ELSE
    sales_commission = 0.02 * sales_amount      ! sales commission is 2% of sales amount
END IF
```

What will be the correct logical expression to fill the condition in the IF statement?

- a) commission_code == 1 .AND. sales_amount > 50000
- b) commission_code == 1 .AND. .NOT. sales_amount <= 50000
- c) sales_amount > 50000 .OR. commission_code == 1
- d) a and b only e) None of them

For questions 24, 25, and 26, assume the variables a, b, c, and d are declared as:

```
INTEGER :: a = 4, b = 6, c = 8, d
```

(The questions are independent of each other.)

24. What are the values of a and b after the following is executed?

```
IF ( a /= b ) a = c
b = c - a
```

- a) 4, 0 b) 6, 0 c) 8, 0 d) 4, 4 e) None of them

25. What are the values of a and b after the following is executed?

```
IF ( a == b ) THEN
    a = c
ELSE
    b = c - a
END IF
```

- a) 4, 0 b) 6, 0 c) 8, 3 d) 4, 4 e) None of them

26. What is the value of d after this block of code is executed?

```
IF ( b > a ) THEN
    d = 0
    IF ( c == a + b ) THEN
        d = 1
    ELSE
        d = 2
    END IF
ELSE
```

```
    d = 3
END IF
```

- a) 0 b) 1 c) 2 d) 3 e) None of them

27. What output does the following code segment produce?

```

INTEGER :: i, sum = 0
DO i = 1, 10
    IF (MOD(i, 5) == 0) EXIT
    sum = sum + i
END DO
WRITE (*, *) sum

```

- a) 10 b) 12 c) 14 d) 16 e) None of them

For questions 28, 29, and 30, consider the following incomplete Fortran code which is supposed to calculate the product of 3, 6, 9, ..., 30.

```

INTEGER :: i, product           ! Line 1
product = _____           ! Line 2
DO i = _____               ! Line 3
    product = _____        ! Line 4
END DO                          ! Line 5

```

Choose the correct entry for each incomplete statement.

28. Line 2

- a) 0 b) 1 c) - 1 d) 3 e) None of them

29. Line 3

- a) 3, 30, 3 b) 3, 31, 3 c) 0, 30, 3 d) a and b only e) All of them are correct

30. Line 4

- a) product + i b) product * i c) i * product d) b and c only e) None of them

31. How many times will the following loop display welcome?

```

INTEGER :: count = 2
LOGICAL :: doit = .TRUE.
DO WHILE (doit)
    count = count - 1
    WRITE (*,*) "Welcome"
    if (count < 0) doit = .FALSE.
END DO

```

- a) 4 b) 3 c) 2 d) 1 e) Forever f) None of them

32. Which of the following is the correct Fortran statement to increment an integer variable b_count by one if the test score of a student is 80 or over but below 90.

- a) IF (test_score >= 80 .AND. test_score < 90) b_count = b_count + 1
 b) IF (.NOT.(test_score >= 90) .AND. .NOT. (test_score < 80)) b_count = b_count + 1
 c) IF (test_score - 80 >= 0 .AND. test_score - 90 < 0) b_count = b_count + 1
 d) a and b only e) a, b, and c only. f) b and c only
 g) None of them

For questions 33, 34, and 35, consider the following Fortran code:

```

SELECT CASE (hours)
CASE (0:10)
    WRITE(*, *) "Quarter Time"
CASE (11:20)

```

```

WRITE(*,*) "Half Time"
CASE (31:40)
WRITE(*,*) "Full Time"
CASE DEFAULT
WRITE (*,*) "Over Time"
END SELECT

```

What will be the output from the SELECT block if

33. hour is -40?

- a) Quarter Time b) Half Time c) Full Time d) Over Time

34. hour is 15?

- a) Quarter Time b) Half Time c) Full Time d) Over Time

35. hour is 25?

- a) Quarter Time b) Half Time c) Full Time d) Over Time

For questions 36 through 38, consider the following code

```

CHARACTER(LEN=1) :: x, letter
READ(*,*) x
x = letter
DO WHILE (letter != '$' )

    IF (x < letter) x = letter
    READ (*,*) letter
END DO
WRITE (*,*) letter

```

and the letters entered from the keyboard during execution are A, a, Z, and \$, one after another.

36. How many times will the WHILE loop be executed?

- a) 3 b) 2 c) 4 d) 1 e) None of them

37. What is output for the variable x ?

- a) A b) a c) Z d) \$ e) None of them

38. What will be output for the variable x if the IF statement in the code segment is replaced by

```
IF ( x > letter) x = letter
```

(Assume the same input data from the keyboard.)

- a) A b) a c) Z d) \$ e) None of them

For questions 39 and 40, consider the following declaration:

```
CHARACTER (LEN = 10) :: message
```

and for all READ statements in the questions, consider the following input from the keyboard: (□ indicates a space.)

WELCOME□TO□VIRGINIA□TECH

39. What will be read for the character variable message by the following READ statement?

```
      READ (*, 10) message
10    FORMAT (A6)
```

- a) WELCOME b) WELCOME□TO c) WELCOME□TO□VIRGINIA□TECH d) None of them

40. What will be read for the character variable message by the following READ statement? (Use the same input to answer this question).

```
      READ (*, *) message
```

- a) WELCOME b) WELCOME□TO c) WELCOME□TO□VIRGINIA□TECH d) None of them