UG Odd Semester (Old) Exam., December—2016

COMPUTER SCIENCE

(1st Semester)

Course No. : CS–104 (O)

(Programming Fundamentals and Problem Solving with FORTRAN)

Full Marks : 75
Pass Marks : 26

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* What is flowchart? Draw a flowchart to find an odd or even number. 2+5=7

(b) Write about different types of FORTRAN constants with examples. 6

(c) Write the name of five built-in-functions in FORTRAN. 2

2. *(a)* What are the types of programming languages? Give example. 6

(b) What is the purpose of the sixth column? 2

(c) Write the following expressions in FORTRAN : 3

(i) $\sqrt{P^3 \quad Q^2}$

(ii) $a^{\cos x} \quad x^{\cos a}$

(iii) $\dfrac{x \quad y}{x \quad y}$

(d) If I 3, J 8 and K 4, what is the value of A in the following statement? 4

(i) $A \quad 3 \quad J/J \quad K \quad 4/J$

(ii) $A \quad J/K \quad 1 \quad J/I \quad K$

UNIT—II

3. *(a)* What are input and output? 2

(b) Write the rules for READ statement. 3

(c) Write a FORTRAN program to determine the area of a triangle using the formula

area $\sqrt{s(s \quad a)(s \quad b)(s \quad c)}$

where $s \quad \dfrac{a \quad b \quad c}{2}$. 6

(d) Suppose I 252, M 135, A 2 7896 and B 0 000142. Find the output if the following WRITE-FORMAT pair is executed. 4

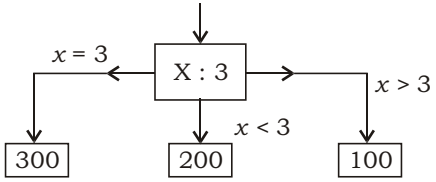
(i) WRITE (6, 11) I, M, A, B
11 FORMAT ('I', I 10, I 6, F 8.1, F 10.3)

(ii) WRITE (6, 12) I, A, B
12 FORMAT (1X, I 10, 2 E 15.5)

4. *(a)* Write the general form of computed GOTO statement and ARITHMETIC IF statement. 2

(b) Write the rules for computed GOTO statement. 3

(c) Write the FORTRAN logical and IF-THEN statement for the following flowchart : 6



(d) Write a program to find the greatest common divisor of two given numbers. 4

UNIT—III

5. *(a)* What is an array? Write the general format of DIMENSION statement. Why is DIMENSION statement required when subscripted variables are used? 7

(b) Write the following DO loops using IF statements : 4+4=8

(i)
```
SUM = 0
DO  5=1,  100
READ ( , 1) A
5  SUM = SUM+A
.....
```

(ii)
```
DO  100  K=1, N, 2
.....
.....
100  CONTINUE
```

6. *(a)* What is the purpose of DO loop? Write the general form of the DO loop. 4

(b) Write the rules for DO loop. 8

(c) Identify the error (if any) in the following program segment and correct it without changing the logical flow : 3

```
DO 4 I=100, 250, 5
  X=X/2·0
  IF (X.GT. 0·0001)
     KNOUT=KNOUT+1
4 CONTINUE
```

UNIT—IV

7. *(a)* Write the differences between a function subprogram and subroutine sub-program with examples. 7

(b) Write a program to multiply two matrices, *A* and *B*. 8

8. *(a)* What is FUNCTION subprogram? Write the general format of a FUNCTION subprogram. Illustrate the concept of linking FUNCTION subprogram with main program. 7

(b) Write a FORTRAN program to sort an array of *n* elements in ascending order. 8

UNIT—V

9. *(a)* Write a program to read the name of a month and print only the first three characters. 7

(b) Write short notes on : 8

(i) EQUIVALENCE statement

(ii) COMMON statement

10. *(a)* Write a program to read a string and print it downwards. 5

(b) Write the values stored for the following DATA statement : 6

(i) DATA A, B, C/1·0, 2×3·0/

(ii) DATA A, B, C/1·0, 3·0, 3·0/

(iii) DATA A, B, C/3×1·0/

(c) Replace the following WHILE structure using IF and GOTO statement : 4

```
      SUM=1
      I=1
WHILE X   I.GE. 0·00005  DO
  SUM = SUM+X    I
      I=I+1
  ENDWHILE
WRITE ( , 5), SUM
.....
.....
```

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