The Open University of Sri Lanka
B.Sc. Degree Programme / Continuing Education Pogramme Level 4
Open Book Test (OBT) – 2010/2011
PCU 2140 – Computing for Scientific Studies using FORTAN

Duration: - **One and half ($1\frac{1}{2}$) hours**

Date: - 25.03.2011 Time: - 4.00p.m.-5.30p.m.

Answer <u>All</u> Questions.

1. Which of the following are valid names in FORTAN for (i) integer variables , (ii) real variables , (iii) neither ? Give reasons for your choice for (iii).

   (a) COURSE1 (b) GRADE (c) REG_NO
   (d) ID-NO (e) AGE3K (f) MARK

2. Using the given values evaluate the following arithmetic expressions, written in FORTAN, where X,Y and Z are real variables and I,J and K are integer variables.

   X=2.0 Y=3.0 Z=2.0 I=3 J=2 K=4

   (a) I/J + J*K (b) Y/X *Z*2 (c) Y**J+X
   (d) I**J*k (e) X**2/Y**3*J (f) X*Y + Y/J*K

3. Write an equivalent FORTAN expression for each of the following algebraic expressions.

   (a) $y=\frac{2}{x^2}+3x(1-x)$ (b) $y=\sin(x+2)+\cos^{-1}x$

   (c) $y=|x|+3^x$ (d) $y=\sqrt{abc}+\left(b-\frac{a}{2}\right)$

   (e) $y=\frac{1}{\sqrt{x^2+1}}.(x+1)$ (f) $y=\frac{a^x}{(b+\sqrt{c})}$

4. Write an equivalent algebraic expression for each of the following FORTAN expressions.

   (a) Y= SQRT(X**2 + 3*X) + X-0.5/X
   (b) Y= (-B + SQRT(B**2 – 4*A*C)) / (2*A)
   (c) Y= A*COS(X) + B**2*SIN(X)
   (d) Y= EXP(X**2-X)/ 2*X
   (e) Y=A+B+C / X**4

5. Let A and B be real variables. Write FORTAN statements for each of the following instructions.

   (a) If A is less than three set X equal to A; otherwise set X= 2A.
   (b) If A is positive, set X=A; otherwise set A equal to zero.
   (c) If the absolute value of X is less than 0.002, go to the statement labeled 20.
   (d) Let B be equal to the square root of the absolute value of A.

6. If A=1.2 and B =4.1, compute the value of the each of the following intrinsic function references.

   (a) ABS (A-B)
   (b) EXP(A)
   (c) NINT (A+B)
   (d) FLOAT(3/5)
   (e) MOD (INT (B/A), 2)
   (e) SQRT (B)

7. Write a FORTAN programme to read x and N and evaluate the sum $x+2x^2+3x^3+\cdots+Nx^N$.

8. Write a FORTAN programme to execute the following three instructions.

   i) Read the values X and Y.
   ii) If X is less than Y, let Z be equal to Y/X; otherwise let Z be equal to X/Y.
   iii) Print Z.

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