AE-750

M.Sc. (Final)
Term End Examination, 2016-17

PHYSICS

Optional

Paper - II (A)

Numerical Methods and Programming

Time : Three Hours]　　　[*Maximum Marks* : 100
[*Minimum Pass Marks* : 36

Note : Answer **five** questions in all, selecting at least **two** questions from each Section. All questions carry equal marks.

Section - A

1. (*a*) Describe solution of non-linear and transcendental equation.

   (*b*) Find a real root of equation $x^3 - 3x - 5$ using bisection method.

249_BSP_(3)　　　　　　　　*(Turn Over)*

(**2**)

2. (*a*) Solve the following system of equations using Gaussian elimination method :

$$x + 2y - z = 3$$
$$3x + 3y - 2z = 5$$
$$2x + 3y - z = 2$$

(*b*) Find the real root of the equation $x = e^x$ by using Newton-Raphson method.

3. Describe Trapezoidal formula and Simpson's $\frac{1}{3}$ formula.

4. Explain solution of ordinary differential equation by Euler and Runge methods.

5. (*a*) Describe Runge-Kutta method for finding the solution of partial differential equation.

(*b*) Apply the fourth order Runge-Kutta method to find $y(0.4)$ given that $y' = (x - y)$, $y(0) = 1$.

Section - B

6. (*a*) Describe C-programming structure and variables assignment declaration and expression.

(*b*) Explain floating point in 'C' data input and output control.

249_BSP_(3)   *(Continued)*

(3)

7. (*a*) Describe Print off and Scanoff function.

   (*b*) Explain control statement and decision making in 'C'.

8. (*a*) Describe local and global variables.

   (*b*) Explain declaration of function and array declaration.

9. (*a*) Describe about nesting of in statement with suitable example.

   (*b*) Describe about nesting of for loop with suitable example.

10. (*a*) Explain while loop statement.

    (*b*) Describe Newton-Raphson integration method for the 'C' programming.

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