Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electrical Engg./ECE) (2018 Batch) (Sem.–2)

MATHEMATICS-II

Subject Code : BTAM-202-18

M.Code : 76255

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Answer briefly :

a) Check whether the given equation is exact and obtain the general solution :

$$(1+x^2)dy + 2xydx = 0$$

b) Solve the differential equation $(x-a)dy/dx + 3y = 12\,(x-a)^3$; $x > a > 0$.

c) Find the solution of the differential equation $y'' + 2y' + 2y = 0$.

d) Find a differential equation of the form $ay'' + by' + cy = 0$, for which e^{-x} and xe^{-x} are solutions.

e) Solve the differential equation $y'''' + 32y'' + 256y = 0$

f) Write a short note on initial value problems.

g) Find the interval in which the root of equation $x^3 - x - 11 = 0$ lies.

h) Write a short note on Bisection method.

i) Define transcendental equation.

j) Find the polynomial which takes following data (0, 1), (1, 2) and (2, 1).

SECTION-B

2. i) Find the integrating factor and hence solve $(5x^3 + 12x^2 + 6y^2)\,dx + 6xy\,dy = 0$

   ii) Solve the differential equation $dy/dx - y = y^2(\sin x + \cos x)$.

3. i) Find a homogeneous linear differential equation with real coefficients of lowest order which has the $xe^{-x} + e^{2x}$ as the particular solution.

   ii) Using differential operator, find general solution of $(D^2 + 9)\,y = xe^{2x}\cos x$.

4. Find the general solution of the equation $y'' + 16y = 32 \sec 2x$, using the method of variation of parameters.

5. Find the general solution of the equation $x^2y'' + 5xy' - 5y = 24x\ln x$.

SECTION-C

6. Use Newton iterative method to find the root of equation $3x - \cos(x) + 1$, by taking initial guess 0.6.

7. Solve the following equations by elimination method $2x + y + z = 10$, $3x + 2y + 3z = 18$ and $x + 4y + 9z = 16$.

8. Using Newton's forward formula, find value of $f(1.6)$, if :

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

9. Using Runge-Kutta method of order 4, find $y(0.2)$ for the equation $y = (y - x)/(y + x)'$ $y(0) = 1$, take $h = 0.2$.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.