

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**I. 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 $x^2 y'' + 5xy' - 5y = 24x \ln x$.

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.