AR 13 SET 01

Code : 13BS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, November-2016
ENGINEERING MATHEMATICS – II
(Common to CIVIL, MECH, CSE, IT)

Time : 3 Hours **Max. Marks : 70**

PART-A

Answer all questions **[10 X 1 = 10 M]**

1. a) If $x_0 = 0$ is a first approximation root of the equation $x^3 - 5x + 3 = 0$, then using Newton-Raphson method, find the next approximation root.
   b) For $y = ax + b$, the normal equations are $15a + 5b = 204$, $55a + 15b = 748$ then find the value of a.
   c) Find $\frac{\Delta^2}{E}\left(e^x\right)$
   d) Write Simpson's 1/3rd rule formula.
   e) Write Modified Euler's formula
   f) Write Milne's predictor formula
   g) Find $L[Cos(at+b)]$
   h) Find $L^{-1}\left[\frac{s}{(s-2)^2}\right]$
   i) Form the partial differential equation by eliminating arbitrary function from $z = f(x^2 + y^2)$
   j) Write one dimensional Heat equation.

PART-B

Answer one question from each unit **[5 X 12 = 60 M]**

UNIT - I

2. a) Solve the equation $x.\tan x = -1$ by Regular False method starting with a=2.5 and b=3 correct to 3 decimal places.
   b) Find a real root of $f(x) = x^3 - 3x + 1 = 0$ near x=0 by using Newton Raphson method.

[6M + 6M]

(OR)

3. a) Find a positive root of the equation $2x = 3 + \cos x$ by iteration method.
   b) Fit a second degree polynomial $y = ax^2 + bx + c$ to the following data using method of least squares

x	0	1	2	3	4	5	6
y	1	2	7	16	29	46	67

[6M + 6M]

UNIT - II

4. a) Find the missing term in the following table

x	1	2	3	4	5
y	2	5	7	-	32

b) Using Newton Forward difference interpolation formula, find y(8) from the following table

X	0	5	10	15	20	25
Y	7	11	14	18	24	32

[6M + 6M]

(OR)

5. a) Using Lagrange's interpolation method, fit a polynomial to the data

X	0	1	3	4
f(x)	-12	0	6	12

b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simpson's $3/8^{th}$ rule by taking the step size h=1/6. **[6M + 6M]**

UNIT - III

6. a) Using Taylor's series, find y at x = 0.1 and x = 0.2 given $y^1 = x + y^2$, y(0)=1

b) solve $\frac{dy}{dx} = x + y$, y(0) = 1 by Picard's method and hence find y(0.2). **[6M + 6M]**

(OR)

7. a) Apply Euler method to find the solution of $\frac{dy}{dx} = \frac{y-x}{y+x}$,y(0)=1 for x=0.1 with h=0.05.

b) Using Runge kutta 2^{nd} order formula solve $\frac{dy}{dx} = 2 + \sqrt{xy}$,y(1) = 1 for x=1.2 with h = 0.2.

[6M + 6M]

UNIT - IV

8. a) Find the Laplace Transform of $\frac{e^{-2t}.Sin3t}{t}$

b) State and Prove 2^{nd} shifting theorem of Laplace transforms. **[6M + 6M]**

(OR)

9. a) Find $L^{-1}\left[\frac{4s+5}{(s+2)(s-1)^2}\right]$

b) Using convolution theorem, find $L^{-1}\left[\frac{s}{(s^2+1)(s^2+4)}\right]$ **[6M + 6M]**

UNIT - V

10. a) Form the partial differential equation by eliminating arbitrary function from

$xy + yz + zx = f\left(\frac{z}{x+y}\right)$

b) Solve $z(x - y) = x^2p - y^2q$ **[6M + 6M]**

(OR)

11. a) Solve $q^2 + p = y - x$

b] Use separation of variables method to solve $\frac{\partial^2 u}{\partial x^2} - \frac{\partial u}{\partial y} = u$ **[6M + 6M]**

AR13 Set-02

Code: 13HS1003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMEMNT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, November-2016
ENVIRONMENTAL STUDIES
(Common to EEE & ECE)

Time: 3 hours **Max Marks: 70**

PART-A

Answer all questions **(10X1=10M)**

1. Write short note on the following:
   a) Environment
   b) Causes of floods
   c) Desert ecosystem
   d) Hot spots of biodiversity in India
   e) Secondary air pollutant
   f) Composition of MSW in India
   g) Cloud seeding
   h) Advantages of EIA
   i) Earth summit
   j) Environmental protection act

PART-B

Answer one question from each unit **(5X12=60M)**

Unit-I

2. a) Define 'ecology'. What is the importance of 'Environmental education'?
   b) What is meant by resource? Explain about water resources and it's over exploitation in India? (6M + 6M)

(OR)

3. a) Write short notes on
      i) Soil erosion and desertification
      ii) Water logging and salinity
   b) Write in detail different impacts of mining on surroundings and on the environment. (3M + 3M+6M)

Unit-II

4. a) Explain the structure and functions of an ecosystem?
   b) What is bio-diversity? What are the threats to Bio-diversity? (6M + 6M)

(OR)

5. a) Write a detailed note on bio –geo chemical cycles of N, C and P in ecosystem.
   b) Define genetic diversity, species diversity and ecosystem diversity and mention the values of biodiversity. (6M + 6M)

Unit-III

6. a) Define noise pollution. What are the sources, effects and control measures?
   b) What is solid waste management? Explain. (6M + 6M)

(OR)

7. a) Define pollution? Describe various types of pollution. Give various methods of controlling Air pollution. (6M + 6M)
   b) Describe composting and incineration, as the methods of solid waste treatment.

Unit-IV

8. a) What is sustainable development? What are the strategies for sustainable development? (6M + 6M)
   b) Write short notes on
      i) Acid rains
      ii) Ozone layer depletion

(OR)

9. Write a brief note on (4M+4M + 4M)
   a) Forest conservation act.
   b) Wild life protection act
   c) Air act

Unit-V

10. a) Describe the factors that affect human population growth rate. (6M + 6M)
    b) What is EIA? Explain any two methods used for preparing EIA?

(OR)

11. a) Distinguish between Stockholm conference and Rio Summit. (6M + 6M)
    b) What is 'Global warming'? Explain the causes and also various mitigate measures.