AR 13 SET-02

Code: 13BS 1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2015

ENGINEERING MATHEMATICS-II
(Common to CE, ME, CSE & IT branches)

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

PART-A

Answer all questions **[10×1=10M]**

1. a) Develop an iterative formula for finding $\sqrt{N}$.

b) Write the normal equations to fit the straight line y= a+ bx to n observations.

c) Evaluate $\Delta^2(ab^x)$ [the interval of difference being h].

d) A curve is drawn to pass through the points given by

x:	0	0.5	1
f(x):	1	0.8	0.5

Estimate the area bounded by the curve, x-axis and the lines x=0, x=1.

e) Using Euler's method, find an approximate value of y corresponding to x= 0.1, given that dy/dx =x+y and y=1 when x=0.

f) Evaluate $\Delta^3[(1-x)(1-2x)(1+3x)]$ (interval of differencing is 2).

g) Form the partial differential equation by eliminating a and b from z= a(x+y)+b.

h) Find the Laplace transform of cos(at+b).

i) Find the complete integral of (p+q)(z-px-qy)=1.

j) Write the one dimensional wave equation.

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PART-B

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

Unit-I

2 a) Find a real root of the equation $x^3-x-1 = 0$ correct to two decimal places by iteration method.

b) Obtain a real root of the equation $x^4-x = 9$ by Newton- Raphson method, correct to three places of decimal. **(6M+6M)**

(**OR**)

3 a) Determine the root of $xe^x-2=0$ by method of false position. **(6M+6M)**

b) Estimate the chlorine residual in a swimming pool 5 hours after it has been treated with chemicals by fitting an exponential curve of the form $Y= A B^X$ to the following data:

No. of hours: X	2	4	6	8	10	12
Chlorine residual: Y Parts/million	1.8	1.5	1.4	1.1	1.1	0.9

Unit-II

4 a) Fit a polynomial of degree three which takes the following values:

x	3	4	5	6
y	6	24	60	120

Use Newton's forward interpolation.

b) Use appropriate central interpolation formula, find the population of a town for the year 1974, given that: **(6M+6M)**

Year	1939	1949	1959	1969	1979	1989
Population in thousands	12	15	20	27	39	52

(**OR**)

5 a) Use Lagrange's interpolation formula, to find the value of y when x=10, if the following values of x and y are given :

x	5	6	9	11
y	12	13	14	16

b) A solid of revolution is formed by rotating about the x-axis, the area between the x-axis, the lines x=0 and x=1 and a curve through the points with the following coordinates:

x	0.00	0.25	0.50	0.75	1.00
y	1.0000	0.9896	0.9589	0.9089	0.8415

Estimate the volume of the solid formed, using Simpson's 1/3 rule. **(6M+6M)**

Unit-III

6) a) The general solution to a differential equation normally defines a family of curves. For the differential equation $dy/dx=x^2y^2$, determine the particular curve that passes through (0,1) using Taylor's series .

b) Determine the value of y when x= 0.1 given that y(0)=1 and $dy/dx= x^2+y$ with step size 0.05, using modified Euler's method. **(6M+6M)**

(**OR**)

7 a) Given that dy/dx = y-x where y(0)=2, find y(0.1) and y(0.2) correct to four decimal places by Runge-Kutta fourth-order formula.

b) Given the differential equation $dy/dx= x^2/(y^2+1)$ with initial condition y=0 when x=0, use Picard's method to obtain y for x= 0.5 correct to three decimal places. **(6M+6M)**

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Unit-IV

8 a) Find the Laplace transform of $t\,e^{-t}\sin 3t$.

b) Determine the Laplace transform of $(e^{-at} - e^{-bt})/t$ (a, b >0). **(6M+6M)**

(**OR**)

9 a) Find the inverse Laplace transform of $\log[(s+1)/(s-1)]$

b) Solve by the method of transform, the equation

$$\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0 \text{ given } y(0) = y'(0) = 0 \text{ and } y''(0) = 6.$$ **(6M+6M)**

Unit-V

10 a) Find the differential equation of all spheres of fixed radius having their centers in the xy-plane.

b) Solve $(mz - ny)\,p + (nx - lz)q = ly - mx$ by Lagrange's multipliers method. **(6M+6M)**

(**OR**)

11) a) Solve $p^2 - q^2 = x - y$. **(6M+6M)**

b) Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, where $u(x,0) = 6\,e^{-3x}$.

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AR 13 SET 02

Code : 13HS1003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March 2015
ENVIRONMENTAL STUDIES
(Common to ECE & EEE)

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

PART-A

Answer all questions **[10X1=10M]**

1. a) What do you mean by environmental degradation?
   b) World Food Day is_____.
   c) Define soil erosion.
   d) What is Ecological succession?
   e) What is Biome?
   f) Write expansion of 'PAN'
   g) Define hazardous waste.
   h) Green House effect is related to _____.
   i) The primary cause acid rain around the world is _____.
   j) What is epidemiology?

PART-B

Answer one question from each unit **[5X12=60M]**

UNIT-I

2. a) What are the different activities that can be taken up to increase the public awareness of the environmental issues?

   b) Critically discuss the composition of the atmosphere and its role [6M+6M]

(OR)

3. a) What do you understand by **Biotic** and **Abiotic** parts of nature?

   b) Define a resource and bring out the major negative impacts along with mitigation plants by the construction of multipurpose hydro electric projects [6M+6M]

UNIT-II

4. a) Define eco system and briefly explain the energy flow in the eco systems along with the energy flow model.

   b) What are major values of bio-diversity? explain [6M+6M]

(OR)

5. a) What steps can be taken to conserve grass lands and what are the common reasons for this destruction of eco systems.

   b) Which type of conservation is better? In-situ or Ex-situ Explain [6M+6M]

UNIT-III

6. a) Define pollutant. Explain about the sources and effects of biomedical waste.

   b) How does thermal pollution affect aquatic life? Explain the means to control Thermal pollution. [6M+6M]

(OR)

7. a) What is solid waste? Explain the cause and effects of solid waste.

   b) Write short notes on the following
   i) Cyclone ii) Land slide. [6M+6M]

UNIT-IV

8. a) 'Urban people have more energy demand than Rural people' - Explain

   b) What is rehabilitation? Explain the Watershed management to conserve water? [6M+6M]

(OR)

9. Discuss briefly the following:
   a) Global Warming
   b) Acid Rain
   c) Depletion of ozone layer [4M+4M+4M]

UNIT-V

10. a) Define health and bring out deferent health problems among humans which are environmentally linked.

    b) Role of IT to improve the environmental quality. [6M+6M]

(OR)

11. Explain the cause and effect of Air Pollution by describing any urban or industrial area that you have studied [12M]