Code: 13BS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2014
ENGINEERING MATHEMATICS-II
(**Common to CE, ME, CSE and IT**)

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

Answer all questions   **PART-A**   **[10×1=10M]**

1. a) Obtain an interval of unit length which contains a root of the equation $x\log_{10}x-1.2=0$.

   b) Write the normal equations to fit the straight line $y= mx +c$ to n observations.

   c) Develop the relation between the Forward difference operator Δ and the differential operator D.

   d) State convolution theorem in Laplace transforms.

   e) Compute the first approximation of Picard's method for the initial value problem

   $$\frac{dy}{dx} = \frac{y-x}{y+x} \ , y(0)=1.$$

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

   g) Find the differential equation whose general solution is given by
      $z(x, y) = f(x- iy)+g(x+iy)$ where f and g are arbitrary twice differentiable functions.

   h) If $f(t)= e^{-2t} \sin 4t$, then find $L(f'(t))$.

   i) Find the complete integral of $pqz= p^4+p^2qx+q^4+q^2py$.

   j) Write the one dimensional heat flow equation.

PART-B

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

Unit-I

2 a) Use iteration method to find a real root of f(x)= cosx- 3x+1=0, near x=1 correct to three
      decimal places.
   b) Find a positive root of x^4-x =10 using Newton- Raphson method.   **(6M+6M)**

(**OR**)

3 a) Find an approximate root of the equation sin x = 1/x , that lies between x=1 and x=1.5
     (measured in radians). Use bisection method and compute approximations up to 5th stage.

   b) Fit the curve of the form y(x)= a b^x to the following data: **(6M+6M)**

x	2	3	4	5	6
y	144.0	172.8	207.4	248.8	298.5

Unit-II

4 a) From the following table, estimate the number of students who obtained marks between 40
     and 45:

Marks:	30-40	40-50	50-60	60-70	70-80
No. of students:	31	42	51	35	31

   b) The population of certain village in thousands is given in the following table. By using
      central forward difference formula, estimate the village population in the year 1936.

(6M+6M)

Year	1901	1911	1921	1931	1941	1951
Population	12	15	20	27	39	52

(**OR**)

5 a) Using Lagrange's interpolation, calculate the profit in the year 2000 from the following data:

Year :	1997	1999	2001	2002
Profit in lakhs(Rs):	43	65	159	248

b) The velocity v of a particle at distance s from a point on its linear path is given by the following table:

s:(m)	0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0
v:(m/sec)	16	19	21	22	20	17	13	11	9

Estimate the time taken by the particle to traverse the distance of 20 meters, using Simpson's 1/3 rule. **(6M+6M)**

Unit-III

6) a) Evaluate y(0.2) by Taylor's series method if y(x) satisfies dy/dx = xy+1, y(0)=1.

b) Using modified Euler's method, find an approximate value of y when x= 0.2 in steps of 0.1, given that dy/dx= x+y and y=1 when x=0. **(6M+6M)**

(**OR**)

7 Apply Runge-Kutta method to find an approximate value of y for x= 0.2 in steps of 0.1, if dy/dx = x+y^2, given that y=1, when x=0.

(12M)

3-4

Unit-IV

8 a) Find the Laplace transform of $(\cos at - \cos bt)/t$.

b) Evaluate the integral by using Laplace transform $\int\limits_{0}^{\infty} te^{-3t} \sin t \, dt$. **(6M+6M)**

(**OR**)

9 a) Use convolution theorem, find the inverse Laplace transform of $s^2/(s^2+a^2)(s^2+b^2)$.

b) Use transforms method to solve $\dfrac{d^2x}{dt^2} - 2\dfrac{dx}{dt} + x = e^t$ with $x = 2, \dfrac{dx}{dt} = -1$ at $t = 0$. **(6M+6M)**

Unit-V

10 a) If $u = f(x^2+2yz, y^2+2zx)$, prove that $(y^2 - zx)\dfrac{\partial u}{\partial x} + (x^2 - yz)\dfrac{\partial u}{\partial y} + (z^2 - xy)\dfrac{\partial u}{\partial z} = 0$.

b) Solve $(y + z)p - (z + x)q = x - y$ by Lagrange's multipliers method. **(6M+6M)**

(**OR**)

11) a) Solve $z^2(p^2+q^2+1) = a^2$.

b) Solve by using method of separation of variables $\dfrac{\partial u}{\partial x} = 4\dfrac{\partial u}{\partial y}$, $u(0, y) = 8 e^{-3y}$. **(6M+6M)**

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Code: 13HS1003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech. I Semester Supplementary Examinations, April-2014
ENVIRONMENTAL STUDIES
(Common to ECE, EEE)

Time: 3 hours   Max Marks: 70

PART – A

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

1. a) World Environment day
    b) Wangari Maathai
    c) Sere
    d) Biomagnification
    e) Cryo-preservation
    f) Poaching
    g) Minamata disease
    h) Composting
    i) Carbon footprint
    j) Ecological pyramid

PART – B

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

Unit – I

2. a) Explain in detail about scope and importance of environmental studies.
    b) Discuss about sustainable agricultural methods with one example.   [6M + 6M]

(OR)

3. a) Write about advantages and disadvantages of dams.
    b) Discuss any two conflicts over water.   [6M + 6M]

Unit – II

4. a) What are detrivores? Explain the function of river ecosystem.
    b) Write a brief note on value of biodiversity.   [6M + 6M]

(OR)

5. a) Define energy flow and explain about Y-shaped energy flow.
   b) Define hotspot and list out advantages and limitations of in-situ and ex-situ conservation
   of biodiversity. [6M + 6M]

Unit – III

6. a) Define primary pollutant and bring out the effects of air pollution.
   b) Explain about control of thermal pollution. [6M + 6M]

(OR)

7. a) What is C.O.D? Draw flow diagram of wastewater treatment plant.
   b) Explain about any case study on nuclear hazards. [6M + 6M]

Unit – IV

8. a) What is Green house effect? Explain about global warming.
   b) Discuss about modern techniques of rain water harvesting. [6M + 6M]

(OR)

9. a) Write a note on Forest conservation act.
   b) What is pH of rain water? Discuss about the part of human being in climate change.
   [6M + 6M]

Unit – V

10. a) Explain about the role of I.T. on human health.
    b) Write a report on local polluted site. [6M + 6M]

(OR)

11. a) Discuss about various effects and control of population growth.
    b) Write your opinions, thoughts and ideas on "how to create awareness among people
    about environment and its conservation". [6M + 6M]

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