AR13 **Set-02**

Code: 13BS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Regular Examinations, February 2015
ENGINEERING MATHEMATICS-II
(Common to CE, ME, CSE & IT)

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

PART – A

Answer all questions **[10×1=10 M]**

1. a) If $x\log_{10} x = 1.2$ has a root lying between 2 and 3 then write the 2nd approximation by bisection method.
   b) Write the normal equations to fit a second degree parabola $y = a + bx + cx^2$.
   c) Evaluate $\Delta^3[(1-x)(1-2x)(1-3x)]$, if the interval of differencing is 2.
   d) State Trapezoidal rule.
   e) Write the formula for Euler's method.
   f) Using Picard's method, write the second approximation of the equation $y' = y + x, y(0) = 1$.
   g) Find $L\{\sin 2t\}$.
   h) State First Shifting Property of Laplace transforms.
   I) Write the complete solution of z=px+qy+pq.
   j) Write the general solution of the one-dimensional wave equation.

PART-B

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

Unit – I

2. a) Find the root of the equation $x + \log_{10} x = 2$ by Newton-Raphson method.
   b) Compute the real root of the equation $xe^x = 2$ by the method of false position. [6M+6M]

(OR)

3. a) Fit a power curve $y = ax^b$ to the following data:

x:	1	2	3	4	5
y:	7.1	27.8	62.1	110	161

   b) Fit a second degree parabola to the following data:

x:	0	1	2	3	4
y:	1	1.8	1.3	2.5	6.3

[6M+6M]

Unit – II

4. a) Apply Newton's forward difference formula to construct a polynomial for the given data and hence find y for x = 5:

x:	4	6	8	10
y:	1	3	8	16

   b) Use Lagrange's interpolation formula to find the value of y when x = 10 from the following data:

x:	5	6	9	11
y:	12	13	14	16

[6M+6M]

(OR)

5. a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ from the following data at x = 2 :

x:	1	1.2	1.4	1.6	1.8	2
y:	2.72	3.32	4.06	4.95	6.05	7.39

b) Using Simpson's 1/3 rd rule find $\int_0^{0.6} e^{-x^2}\,dx$ by taking seven ordinates. [6M+6M]

Unit – III

6. a) Using Taylor's series method solve $y' = xy + y^2, y(0) = 1$ at $x = 0.1, 0.2, 0.3$.
b) Using Euler's method solve for y at x = 0.1 from dy/dx = x + y + xy, y(0) = 1 with h = 0.025.[6M+6M]

(OR)

7. Solve by Milne's predictor-corrector method to find $y(0.8)$ from $\frac{dy}{dx} = 1 + y^2, y(0) = 0$ by obtaining the initial values $y(0.2)$, $y(0.4)$, $y(0.6)$ from R-K Method. [12M]

Unit – IV

8. a) Using Laplace transforms, evaluate $\int_0^{\infty} \frac{\cos at - \cos bt}{t} dt$.

b) Find the inverse Laplace transform of $\frac{s}{s^2 + 4a^2}$. [8M+4M]

(OR)

9. a) Using convolution theorem, find $L^{-1}\left\{\frac{s^2}{(s^2 + a^2)(s^2 + b^2)}\right\}$.

b) Solve $y'' + 4y = a\sin(2t + 2), y(0) = 0, y'(0) = 0$ using Laplace transforms. [6M+6M]

Unit – V

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

(OR)

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

b) Solve the one dimensional heat-flow equation, using the conditions u(0,t) = 0, u(l ,t) = 0 and u(x,0) = $lx - x^2$, $0 \le x \le l$. [6M+6M]

AR 13 **SET 01**

Code : 13HS1003

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

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

PART-A

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

1. a) Define environment
   b) Green plants are also called
   c) Herbivores are _____consumers
   d) What is the full form of SPCB
   e) Within a community, diversity is called?
   f) What is a pollutant?
   g) Noise is _____ sound
   h) Ozone layer is present in the_____
   i) Define Demography?
   j) The World AIDS day is _____

PART-B

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

UNIT-I

2. a) Write about the scope of environmental studies?
   b) Discuss in detail the importance and components of environmental studies [6M+6M]

(OR)

3. a) Discuss in detail the hydrological cycle?
   b) Define energy and explain various merits and demerits in using non-renewable energy resources. [6M+6M]

UNIT-II

4. a) Briefly explain the manner in which eco system is destroyed by the human activities.
   b) Discuss how India is considered as a mega diversity nation. [6M+6M]

(OR)

5. a) Explain the important types and characters of a forest eco system.
   b) What is bio diversity? Explain the concept of In-situ conservation of bio diversity. [6M+6M]

UNIT-III

6. a) Discuss different effects of air pollution on man and materials?
   b) Describe the causes of Chernobyl Disaster and discuss the lessons to be learnt from this incident. [6M+6M]

(OR)

7. a) Bring out the main elements of water conservations.
   b) Briefly describe the methods of heating and the disposal of solid waste. [6M+6M]

UNIT-IV

8. a) Define water shed management and explain its objectives.
   b) What is sustainable development? Explain urban energy related problems. [6M+6M]

(OR)

9. Discuss briefly the provision of the following Acts:
   a) The Water (Prevention control of pollution) Act 1974
   b) The Air (Prevention control of pollution) Act 1981
   c) The Wild life protection Act 1971 [4M+4M+4M]

UNIT-V

10. a) Describe the problems created by the growing population of the earth.
    b) Write a note on the family welfare programme in India. [6M+6M]

(OR)

11. a) Write about any polluted site you have visited and describe you finding in detail.
    b) Discuss the rise of urban slums and their problems [6M+6M]