AR 13 SET-01

Code: 13BS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.TECH I SEMESTER REGULAR EXAMINATIONS, FEBRUARY-2014

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

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

PART-A

Answer all Questions [10X1=10M]

1. a) Find a root x_2 lies between 2 and 3 for $x^3 - 2x - 5 = 0$

   b) Form Normal equations for each constant to fit the parabola $y = a + bx + cx^2$

   c) With usual notations, Show that $\Delta^3 y_2 = \nabla^3 y_5$

   d) Sate Newton-Cotes quadrature formula

   e) Write Newton's Backward Interpolation formula

   f) The Third approximation in Picards Method

   g) Write Change of Scale Property

   h) Find $L^{-1}\left[\frac{s+2}{s^2-4s+13}\right]2$

   i) Form the Partial Differential Equation from $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$

   j) Write one dimensional heat flow equation

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PART-B

Unit-I

2. a) Find a real root of the equation $x\ log_{10}^{x} = 1.2$ by Regula Falsi method correct to 4 decimal Places

   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]

(OR)

3. a) Find by Newtons method, the real root of $3x = Cosx + 1$

   b) Predict the mean radiation dose at an altitude of 3000 feet by fitting an exponential curve $y = ab^x$ to the given data

Altitude (x)	50	450	780	1200	4400	4800	5300
Dose of radiation(y)	28	30	32	36	51	58	69

[6M+6M]

Unit-II

4. a) Prove with usual notations, that

   i) $hD = \log(1 + \Delta) = -\log(1 - \nabla) = Sinh^{-1}(\mu\delta)$

   ii) $\left(E^{1/2} + E^{-1/2}\right)(1 + \Delta)^{1/2} = 2 + \Delta$

   iii) $\Delta = \frac{1}{2}\delta^2 + \delta\sqrt{\left(1 + {\delta^2}/{4}\right)}$

   b) 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
Number of Students	31	42	51	35	31

[6M+6M]

(OR)

5. a) Given that

X	1.0	1.1	1.2	1.3	1.4	1.5	1.6
Y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=1.1 and x=1.6

b) Use Simpsons $\frac{1}{3}$ rd Rule to find $\int_0^{0.6} e^{-x^2}\,dx$ by taking 7 ordinates

[6M+6M]

Unit-III

6. a) Find by Taylors series method the value of y at x=0.1 and x=0.2 to five places of decimals from $\frac{dy}{dx} = x^2y - 1, y(0) = 1$

b) Given $\frac{dy}{dx} = \frac{y-x}{y+x}$ with initial condition y=1 at x=0, find y for x=0.1 by using Eulers method with h=0.02 [6M+6M]

(OR)

7. a) Using Runge Kutta method of Fourth order, Solve $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ with $y(0) = 1$ at x=0.2,0.4

b) Apply Milnes method to find a solution opf $y^{II} = x - y^2$ in the range $0 \le x \le 1$ for the boundary condition $y = 0$ at $x = 0$ [6M+6M]

Unit-IV

8. a) Evaluate i) $L\left[e^{-t}\int_0^t \frac{Sint}{t}\,dt\right]$

ii) $L[t^2 Sinat]$

b) Evaluate $\int_0^\infty t\,e^{-3t} Sint\,dt$ by using Laplace transform [6M+6M]

(OR)

9. a) Find the inverse Laplace transform of $\frac{2s^2-6s+5}{s^3-6s^2+11s-6}$

   b) Find the Inverse Laplace transform of $\frac{s^2}{(s^2+a^2)(s^2+b^2)}$ using Convolution theorem [6M+6M]

Unit-V

10. a) Form the partial differential equation by eliminating atibitrary function from $z = f(x + at) + g(x - at)$

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

(OR)

11. a) Solve $(mz - ny)\frac{\partial z}{\partial x} + (nx - lz)\frac{\partial z}{\partial y} = ly - mx$

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

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

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

PART – A

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

1. a) MOEF
   b) Environmental Day
   c) WHO stands for?
   d) Ecology
   e) A Renewable Resource is
   f) Earth's lungs
   g) Mycorrhizae
   h) Red data book
   i) Units of ozone layer
   j) Primary Air Pollutant

PART – B

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

Unit – I

2. a) Explain the scope of Research and Development in Environmental Studies.
   b) What are the possible ways that we can create environmental awareness?[6M+6M]

(OR)

3. a) Write the causes and effects for floods? Define drought? Explain meteorological, agricultural and hydrological, socio economic effects of droughts?
   b) Explain the Sustainable Water Management? [6M+6M]

Unit – II

4. a) Explain the structural and functional components that play a vital role in an ecosystem.
   b) Define Biodiversity? Explain the concept of Hotspots of Biodiversity [6M+6M]

(OR)

5. a) Describe the concept of Ecological succession? Briefly explain the concept on food chains, food webs and ecological pyramids.
   b) Explain the concept of Endangered and endemic species of India [6M+6M]

Unit – III

6. a) Explain the causes, effects and control measures for soil pollution
   b) Write the causes, effects and control of the global warming. [6M+6M]

(OR)

7. a) Explain the causes, effects and control measures for Air pollution
   b) Write the causes, effects and control of ozone layer depletion. [6M+6M]

Unit – IV

8. a) Explain the rain water harvesting and cloud seeding [6M+6M]
   b) Analyze various environmental and socio-economical impacts of mining activity.

(OR)

9. a) Wildlife protection Act.
   b) Describe the role of an individual in prevention of pollution. [6M+6M]

Unit – V

10. a) Define Population. How is it regulated?
    b) Role of IT in Environment and Human Health. [6M+6M]

(OR)

11. a) Explain the Environmental Documentation [6M+6M]
    b) Write the causes, effect and control of Occupational health problems in slum areas.