Code : 13BS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, Jan / Feb-2016

ENGINEERING MATHEMATICS – II

(Common to CE, ME, CSE & IT)

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

PART-A

Answer all Questions **(10 x 1 = 10 Marks)**

1. a) If $x^3 + 3x - 5$ has a root in (1, 2), by Regula falsi method find the first approximation for the root.
   b) What is the method of least squares?
   c) Define backward difference operator.
   d) State simpson's 1/3 rule.
   e) If $\frac{dy}{dx} = x^2 + y^2,\ y(0) = 1$, find $y'(0), y''(0)$
   f) State the formula for Euler's method for solving the differential equation $\frac{dy}{dx} = f(x, y), y(x_0) = y_0$.
   g) Find $L[t\cos t]$
   h) Find $L^{-1}\left[\frac{1}{(s+2)^2}\right]$
   i) Eliminate a and b from $z = axy + b$
   j) Solve the partial differential equation $p^2 + q^2 = 1$

PART-B

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

2. a) Using Regula Falsi method find a real root of the equation $x^3 + 5x - 7 = 0$
   b) Using Newton – Raphson method find a real root of the equation $x + \log_{10} x = 3.375$

(OR)

3. Find the values of $a, b, and\ c$ so that $y = a + bx + cx^2$ is the best fit to the following data and also estimate $y(2.4)$

x	1	2	3	4
y	1.7	1.8	2.3	3.2

UNIT-II

4. a) Show that $E = e^{hD}$ and $\Delta = \frac{1}{2}\delta^2 + \delta\sqrt{1 + \frac{\delta^2}{4}}$
   b) Given the following values of $x, f(x) = \log x$

x	4.0	4.2	4.4	4.6	4.8	5.0	5.2
$f(x)$	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6484

Evaluate $\int_4^{5.2} \log x\, dx$ by Simpson's $\frac{1}{3}$ rule

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(OR)

5. a) Find the polynomial of degree two or less such that $f(0)=1, f(1)=3, f(3)=55$ by Lagrange's interpolation formula and hence find $f(2)$.

   b) Compute $y(17)$ using Newton's backward difference formula, from the following table.

x	8	10	12	14	16	18
y	10	19	32.5	54	89.5	15.4

UNIT-III

6. a) Solve $\frac{dy}{dx}=3e^x+2y,\ y(0)=0$ by Taylor series method upto 4 terms and hence find $y(1.2)$

   b) Solve $\frac{dy}{dx}=1+y^2$, $y(0)=0$ by Picard's method

(OR)

7. Using Runge Kutta method of fourth order, solve $\frac{dy}{dx}=x+y^2$ with $y(0)=1$ *at* $x=0.1, 0.2$

UNIT-IV

8. a) Find the Laplace transform of $f(t)$ defined as $f(t)=\begin{cases} t^2, & 0<t<2 \\ t-1, & 2<t<3 \\ 7, & t>3 \end{cases}$

   b) Using Convolution theorem, evaluate $L^{-1}\left(\frac{s^2}{(s^2+a^2)^2}\right)$

(OR)

9. Solve $y''-3y'+2y=4t+e^{3t}$ where $y(0)=1,\ y'(0)=-1$ by using Laplace transforms

UNIT-V

10. a) Solve $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$

    b) Solve $\frac{\partial u}{\partial x}=4\frac{\partial u}{\partial y}$ *with* $u(0,y)=8e^{-3y}$ by the method of separation of variables

(OR)

11. A tightly stretched string of length l is fixed at the ends. It is initially in equilibrium and set vibrating by giving a velocity $v_0 \sin^3\left(\frac{\pi x}{l}\right)$ at each point. Find the displacement at any point.

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Code: 13HS1003 **SET-2**

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

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

PART – A

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

1. a) Hydrosphere
   b) Deforestation
   c) Succession
   d) Endangered species
   e) Land reclamation
   f) Food chain
   g) Sustainable development
   h) Landslides
   i) Ozone depletion
   j) Industrialization

PART-B

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

UNIT-I

2. a) What is the need for public awareness and participation in the environmental education? Discuss.

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

(OR)

3. a) What do you mean by Deforestation? Discuss its causes.
   b) Define energy and explain various merits and demerits in using non-renewable energy resources? [6M + 6M]

UNIT-II

4 a) What are the functional components of Ecosystem?

b) Discuss the Bio-geographical classification of India and values of biological resources [4M + 8M]

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(OR)

5. a) Explain the important types and characters of a aquatic ecosystem?

   b) Discuss in brief the biodiversity at Global Level and National Level also. [6M + 6M]

UNIT-III

6. a Discuss the various ways of control of air pollution.
   b) Discuss different effects of thermal pollution on man and materials? [6M + 6M]

(OR)

7. a) Explain about the sources and effects of biomedical waste?

   b) Write about the various ways of Solid Waste Management. [6M + 6M]

UNIT-IV

8. a) Define sustainable development and explain urban energy related problems?
   b) Write a detailed note on rain water harvesting.
   [6M + 6M]

(OR)

9. a) Write notes on volcanos
   b) Nuclear holocaust with case study?
   c) Forest Conservation Act [4M + 4M + 4M]

UNIT-V

10 a) Explain why variations of population between different nations.
   b) What are the main provisions of the Environmental Protection Act of 1986?
   [7M + 5M]

(OR)

11. a) Role of IT in Environment and Human health
   b) Rise of urban slums and their problems?
   c) How does the value education help the environment? [4M + 4M + 4M]

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