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CE221 (R18)

B.TECH. DEGREE EXAMINATION, SEPTEMBER-2024

Semester IV [Second Year] (Supplementary)

MATHEMATICS - III

Time: Three hours   Maximum Marks: 60

Answer Question No.1 compulsorily. (12 x 1 = 12)
Answer One Question from each unit. (4 x 12 = 48)

1. Answer the following:
   (a) Find the Laplace transform of cos (2t + 3).   CO1
   (b) Write first shifting property for Laplace transform.   CO1
   (c) Write Laplace transform of periodic function.   CO1
   (d) Define Fourier transform of f(x).   CO2
   (e) Define Fourier cosine transform of f(x).   CO2
   (f) Define inverse Fourier sine transform of f(x).   CO2
   (g) Write $\Delta(\cos x)$.   CO3
   (h) Write Newton's forward interpolation formula.   CO3
   (i) Write Lagrange's interpolation formula.   CO3
   (j) Write Simpson's 1/3rd formula.   CO4
   (k) Explain Euler's formula.   CO4
   (l) Write Poisson's equation.   CO4

UNIT – I

2. (a) Find the Laplace transform of the function
        $f(t) = |t-1| + |t+1|, t \geq 0.$ (6M) CO1

   (b) Evaluate $\int\limits_{0}^{\infty} t\, e^{-3t} \sin t\, dt$ (6M) CO1

(OR)

3. (a) Find the Laplace transform of the full-wave
        rectifier $f(t) = E \sin \omega t, 0 < t < \dfrac{\pi}{\omega}$, having period $\dfrac{\pi}{\omega}$.   (6M) CO1

   (b) Find the inverse transform of $\dfrac{4s+5}{(s-1)^2(s+2)}$.   (6M) CO1

UNIT – II

4. Solve $(D^3 - 3D^2 + 3D - 1)y = t^2e^t$ given that $y(0) = 1$, $y'(0) = 0$, $y''(0) = -2$. (CO2)

(OR)

5. (a) Find the Fourier transform of
$$f(x) = \begin{cases} 1 & \text{for } |x| < 1 \\ 0 & \text{for } |x| < 1 \end{cases}$$
Hence evaluate $\int_0^\infty \frac{\sin x}{x} dx$. (6M) CO2

(b) Find the Fourier cosine transform of
$$f(x) = \begin{cases} \cos x, & 0 < x < a \\ 0, & x \geq a \end{cases}$$
(6M) CO2

UNIT – III

6. (a) Find the positive root of $x^4 - x = 10$ correct to three decimal places, using Newton-Raphson method. (6M) CO3

(b) Solve the equations $10x + y + z = 12$, $2x + 10y + z = 13$, $2x + 2y + 10z = 14$ by Gauss- Seidel method. (6M) CO3

(OR)

7. From the following table, estimate the number of students who obtained marks between 40 and 45: CO3

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

UNIT – IV

8. (a) Evaluate $\int_0^6 \frac{dx}{1 + x^2}$ by using trapezoidal rule by taking $h = 1$. (6M) CO4

(b) Find by Taylor's series method the value of y at $x = 0.2$ for $\frac{dy}{dx} = 2y + 3e^x, y(0) = 0$. (6M) CO4

(OR)

9. (a) Using Euler's method, find an approximate value of y corresponding to $x = 1$ given that $y' = x + y$ and $y = 1$ when $x = 0$. (6M) CO4

(b) Apply Runge-Kutta method, to find an approximate value of y when $x = 0.2$ in steps of 0.1 if $y' = x + y^2$, $y_0 = 1$. (6M) CO4

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CE221 (R18)

B.TECH. DEGREE EXAMINATION, SEPTEMBER-2024

Semester IV [Second Year] (Supplementary)

MATHEMATICS - III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Find the Laplace transform of f(t) = sint.   CO1
   (b) State the change of scale property of Laplace transform.   CO1
   (c) Define Laplace transform of f(t).   CO1
   (d) Find the Inverse Laplace transform of $\left(\frac{1}{s^2+a^2}\right)$.   CO2
   (e) Define Inverse Fourier transform.   CO2
   (f) Find the Fourier sine transform of $f(x) = e^{-x}, x > 0$ CO2
   (g) Find $L[y^{11}(t)]$.   CO3
   (h) Write $\frac{dy}{dx}$ at $x = x_o$, using Newton's forward difference.   CO3
   (i) Prove that $\Delta = E - 1$.   CO3
   (j) Write Newton's iterative formulae for f(x) = 0.   CO4
   (k) Explain Taylor's series method.   CO4
   (l) Write Simpson's $1/3^{rd}$ rule.   CO4
   (m) Write the advantage of R-K method of order 4.   CO4
   (n) Write Laplace equation.   CO4

UNIT – I

2. (a) Find the Laplace transform of (i) t sint
      (ii) $\frac{e^{-at}-e^{-bt}}{t}$ (7M) CO1
   (b) Find the Inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$.   (7M) CO1

(OR)

3. (a) Apply the Convolution theorem, find $L^{-1}\left(\frac{s}{(s^2+a^2)(s^2+b^2)}\right)$. (7M) CO1

(b) Find L (t Sin 3t Cos 2t). (7M) CO1

UNIT – II

4. (a) Solve $\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 3y = e^{-t}$, given y(0) = 1 and $y^1(0)=1$ using Laplace transform method. (7M) CO2

(b) Solve $y^{11} + 2y^1 - 3y = \sin t$, given that y(0)= 0 and $y^1(0) = 0$ using Laplace transform method. (7M) CO2

(OR)

5. (a) Find the Fourier cosine transform of f(x) = e^{-ax}, x > 0. (7M) CO2

(b) Find the Fourier transform of
$$f(x) = \begin{cases} 1 - |x| \text{ for } |x| \le 1 \\ 0 \quad \text{for} \quad |x| > 1 \end{cases}$$
(7M) CO2

UNIT – III

6. (a) Find a real root of the equation $x\, e^x = \cos x$, correct to three decimals. (7M) CO3

(b) Construct Newton's forward interpolation polynomial for the following values, hence find f(4) (7M) CO3

x	0	1	2	3
f(x)	1	2	1	10

(OR)

7. (a) Find Lagrange's interpolation polynomial f(x), given that (7M) CO3

x	0	2	3	6
f(x)	648	704	728	792

(b) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x = 1.0, given that (7M) CO3

x	1.0	1.2	1.4	1.6	1.8	2.0
y	0.0	0.128	0.544	1.296	2.432	4.000

UNIT – IV

8. (a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simphson's $1/3^{rd}$ rule, taking $h = \frac{1}{4}$. (7M) CO4

(b) Apply R-K method of order 4, compute y(0.2) taking h = 0.1 if $\frac{dy}{dx} = x+y^2$, y(0) = 1. (7M) CO4

(OR)

9. Solve the Poisson's equation $\nabla^2 u = -10\,(x^2 + y^2 + 10)$ over the square mesh with sides x = 0 = y, x = 3 = y with u(x, y) = 0 on the boundary and mesh length is 1. CO4

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CE221 (R20)

B.TECH. DEGREE EXAMINATION, MAY-2024

Semester IV [Second Year] (Regular & Supplementary)

MATHEMATICS-III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) State change scale property of Laplace transforms.   CO1
   (b) Find $L\{te^{2t}\}$.   CO1
   (c) State convolution theorem.   CO1
   (d) Define transforms of derivative property of Laplace
       transforms.   CO2
   (e) Define Fourier sine transform.   CO2
   (f) Define inverse Fourier transform.   CO2
   (g) Write the Newton's forward difference formula for
       finding first order derivative.   CO3
   (h) Write Newton Raphson iterative formula.   CO3
   (i) Write Newton forward interpolation formula.   CO3
   (j) Evaluate $\Delta(x^2)$, h = 1.   CO4
   (k) Write the Laplace equation.   CO4
   (l) Write Simpson's $1/3^{rd}$ rule.   CO4
   (m) Write Taylor series for solving ODE.   CO4
   (n) Write Euler's method iterative formula.   CO4

UNIT – I

2. (a) Find $L\{te^{-3t}\sin 2t\}$.   (7M) CO1
   (b) Find the Laplace transform of the full-wave
       rectifier $f(t) = E\sin \omega t$, $0 < t < \pi /\omega$, having
       period π /ω.   (7M) CO1

(OR)

3. (a) Find $L^{-1}\left\{\frac{1}{(s+1)(s+2)^2}\right\}$. (7M) CO1

   (b) Using Convolution theorem evaluate
   $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9)}\right\}$. (7M) CO1

UNIT – II

4. Using transformation method, find the solution of the initial value problem $y'' - 3y' + 2y = 4e^{2t}$ with $y(0) = -3$ and $y'(0) = 5$. CO2

(OR)

5. (a) Find the Fourier transform of
   $$f(x) = \begin{cases} 1 & for \ |x| < 1 \\ 0 & for \ |x| > 1 \end{cases}$$ (7M) CO2

   (b) Find the Fourier cosine transform of
   $$f(x) = \begin{cases} x & for \ 0 < x < 1 \\ 2-x & for \ 1 < x < 2 \\ 0 & for \ x > 2 \end{cases}$$ (7M) CO2

UNIT – III

6. (a) Solve the equations $2x + y + z = 16$, $2x + 9y + 3z = 29$, $2x + 4y + 8z = 34$ by Gauss-Seidel method. (7M) CO3

   (b) Compute using Newton's backward difference formula, from the following table. (7M) CO3

x	6	8	10	12	14	16
y	10	19	32.5	54	89.5	15.4

(OR)

7. Using Lagrange's interpolation formula evaluate $f(9)$, from the following table: CO3

x	5	7	11	13	17
f(x)	150	392	1492	2366	5202

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UNIT – IV

8. (a) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ using trapezoidal, Simpson's $\frac{1}{3}$rd rule, h = 1. (7M) CO4

   (b) Using Euler's method find y(0.2) given that
   $\frac{dy}{dx} = x - y^2, y(0) = 1, h = 0.1$ (7M) CO4

(OR)

9. Using Runge-Kutta method of order 4, find y(0.1), y(0.2) given that $\frac{dy}{dx} = x + 4y$, y(0) = 1, taking h = 0.1 CO4

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Hall Ticket Number:

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CE221 (R20)

B.TECH. DEGREE EXAMINATION, NOVEMBER-2023
Semester IV [Second Year] (Supplementary)

MATHEMATICS - III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) State multiplication by t property of Laplace transforms.   CO1
   (b) Find $L\{te^{-t}\}$.   CO1
   (c) Find $L^{-1}\left\{\frac{1}{((s-2)^2)}\right\}$.   CO1
   (d) Define inverse Fourier sine transform.   CO2
   (e) Define Fourier cosine transform.   CO2
   (f) Define Fourier transform.   CO2
   (g) Write the Newton's backward difference formula for finding first order derivative.   CO3
   (h) Evaluate $\nabla(x^2)$, h = 1.   CO3
   (i) Write Newton backward interpolation formula. CO3
   (j) Evaluate $\Delta(e^x)$, h = 1.   CO3
   (k) Write the Poisson's equation.   CO4
   (l) Write Trapezoidal rule.   CO4
   (m) Write Simson's $1/3^{rd}$ rule.   CO4
   (n) Explain R-K method.   CO4

UNIT – I

2. (a) Find $L\left\{\frac{\cos2t - \cos t}{t}\right\}$.   (7M) CO1
   (b) Using Laplace transform, evaluate $\int_0^\infty te^{-2t}\sin3t\, dt$.   (7M) CO1

(OR)

3. (a) Using partial fractions find $L^{-1}\left\{\frac{1}{(s+1)(s+2)(s+3)}\right\}$. (7M) CO1

   (b) Using Convolution theorem find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+4)}\right\}$. (7M) CO1

UNIT – II

4. Using Laplace transform method, find the solution of the initial value problem $y'' + y = t$ with $y(0) = 1$ and $y'(0) = 0$. CO2

(OR)

5. (a) Find the Fourier transform of (7M) CO2
$$f(x) = \begin{cases} 1 - x^2 & \text{for } |x| \le 1 \\ 0 & \text{for } |x| > 1 \end{cases}$$

   (b) Find the Fourier sine transform of (7M) CO2
$$f(x) = \begin{cases} 4x & \text{for } 0 < x < 1 \\ 4 - x & \text{for } 1 < x < 4 \\ 0 & \text{for } x > 4 \end{cases}$$

UNIT – III

6. (a) Evaluate $\sqrt{5}$ using Newton Raphson method correct up to 3 decimal places. (7M) CO3

   (b) From the following table estimate the number of students who obtained marks between 30 and 45 (7M) CO3

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

(OR)

7. Using Lagrange's interpolation formula evaluate f(7), from the following table CO3

x	1	5	6	9	13
f(x)	24	38	47	64	72

UNIT – IV

8. (a) Evaluate $\int_0^6 \frac{dx}{1+x^4}$ using trapezoidal, Simpson's $\frac{1}{3}$rd rule, take $h = 1$. (7M) CO4

   (b) Using Euler's method find y(0.2) given that $\frac{dy}{dx} = x + y^2$, $y(0) = 1$, $h = 0.1$. (7M) CO4

(OR)

9. Using Runge-Kutta method of order 4, find y(0.1), y(0.2) given that $\frac{dy}{dx} = x^2 - y^2$, $y(0) = 1$, taking $h = 0.1$. CO4

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CE221 (R20)

B.TECH. DEGREE EXAMINATION, JULY-2023

Semester IV [Second Year] (Regular & Supplementary)

MATHEMATICS - III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) State linearity property of Laplace transform.   CO1
   (b) What is the Laplace transform of $e^{at} \sin bt$.   CO1
   (c) State convolution theorem.   CO1
   (d) Define Fourier transform of a function f(x).   CO2
   (e) If F(s) and G(s) are Fourier transforms of f(t) and g(t) respectively then find F{af(x) + bg(x)}.   CO2
   (f) Define inverse Fourier cosine transform of a function f(x).   CO2
   (g) Write Newton's backward interpolation formula.   CO3
   (h) Evaluate $\Delta(x^2 + 2x)$.   CO3
   (i) State Lagrange's interpolation formula for (x_0, y_0), (x_1, y_1), (x_2, y_2).   CO3
   (j) State trapezoidal rule to evaluate definite integral.   CO4
   (k) Write the formula for k_2 in 4th order R-K method.   CO4
   (l) Explain Euler's iteration scheme.   CO4
   (m) Write a note on forward differences.   CO3
   (n) Write Laplace equation.   CO4

UNIT – I

2. (a) Find the Laplace transform of
      $e^{2t} + 4t^3 - 2\sin 3t + 3\cos 3t$ (7M) CO1

   (b) Using Laplace transform evaluate $\int_0^\infty \frac{\sin t}{t} dt$ (7M) CO1

(OR)

3. (a) Find inverse Laplace transform of $\frac{1}{s^2+2s+5}$ (7M) CO1

   (b) Using Convolution theorem find inverse Laplace transform of $\frac{s^2}{s^4-a^4}$ (7M) CO1

UNIT – II

4. Using Laplace transform solve the differential equation $x''-2x'+x=e^t$, $x=2$, $x'=-1$ at $t=0$.   CO2

(OR)

5. (a) Find Fourier sine transform of xe^{-ax} (7M) CO2

   (b) Find the Fourier transform of
   $$f(x) = \begin{cases} 1, |x| < a \\ 0, |x| > a \end{cases}$$
         (7M) CO2

UNIT – III

6. (a) Using Gauss seidel method solve the equation $27x+6y-z=85$, $x+y+54z=110$, $6x+15y+2z=72$ (7M) CO3

   (b) Evaluate $\Delta^2\left(\dfrac{1}{x^2+5x+6}\right)$ (7M) CO3

(OR)

7. (a) The population of a town in the decimal census was given below in thousands. Estimate the population for the year 1895.   (7M) CO3

Year (x)	1891	1901	1911	1921	1931
Population(y)	46	66	81	93	101

   (b) Find y' and y'' at $x=0$ from the following data   (7M) CO3

x	0	1	2	3	4	5
y	4	8	15	7	6	2

UNIT – IV

8. (a) Using Simpson's rule evaluate $\int_0^1 \frac{1}{1+x^2}dx$ (7M) CO4

   (b) Using Taylor's series method find y(0.4) for the differential equation $y'=x^2+y^2$ given $y(0)=0$.   (7M) CO4

(OR)

9. Using Runge- Kutta 4th order method find y(1.2) for the differential equation $y'=x-y$, $y(1)=0.4$, take h=0.1   CO4

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CE221 (R20)

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B.TECH. DEGREE EXAMINATION, JANUARY-2023

Semester IV [Second Year] (Supplementary)

MATHEMATICS - III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Find the Laplace transform of (a^t).   CO1
   (b) State the First shifting property of Laplace transform.   CO1
   (c) State Convolution theorem.   CO1
   (d) Find the Inverse Laplace transform of $\left(\frac{1}{s+a}\right)$.   CO1
   (e) Define Fourier transform of f(x).   CO2
   (f) Find the Fourier Sine transform of f(x).   CO2
   (g) Find the Fourier Cosine transform of $f(x) = e^{-x}$, x > 0.   CO2
   (h) Write Newton's Iterative formulae for $\sqrt{N}$ CO3
   (i) Evaluate $\Delta(e^x)$, h = 1.   CO3
   (j) Write Lagrange's Interpolation formula.   CO3
   (k) Write Trapezoidal Rule.   CO4
   (l) Explain Euler's Method.   CO4
   (m) Write Elliptic Equation.   CO4
   (n) Classify the equation $u_{xx} + u_{xy} - 2u_{yy} = 0$.   CO4

UNIT – I

2. (a) Find the Laplace Transform of $\frac{Cosat-Cosbt}{t}$ (7M) CO1
   (b) If $f(t) = t,\ o < t < a$
                $= 2a{-}t,\ a < t < 2a,$ Find $L(f(t))$ (7M) CO1

(OR)

3. (a) Find the Inverse Laplace transform $\frac{1}{2}\log\left(\frac{s^2+b^2}{s^2+a^2}\right)$ (7M) CO1

(b) Apply convolution theorem to evaluate $L^{-1}\left(\frac{s}{(s^2+a^2)(s^2+b^2)}\right)$ (7M) CO1

UNIT – II

4. (a) Solve the differential equation using Laplace transform method, if $y'' - 3y' + 2y = 4t + e^{3t}$, $y(0) = 1$ and $y'(0) = 1$. (7M) CO2

(b) Solve $y'' - y = a\cosh t$, $y(0) = 0$ & $y'(0) = 0$ using Laplace transform method. (7M) CO2

(OR)

5. (a) Find the Fourier transform of
$$f(x) = \begin{cases} 1 - x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$$ (7M) CO2

(b) Find the Fourier Sine transform of
$$f(x) = \begin{cases} \sin x, & 0 \le x \le a \\ 0, & x \ge a \end{cases}$$ (7M) CO2

UNIT – III

6. (a) Solve by Gauss Siedal method, the equations
$20x + y - 2z = 17$, $3x + 20y - z = -18$ and $2x - 3y + 20z = 25$ (7M) CO3

(b) Construct Newton's forward interpolation polynomial y = f(x) for the following data (7M) CO3

x	4	6	8	10
y	1	3	8	16

(OR)

7. (a) Apply Lagrange's formula to find the value of y when $x = 10$, given that (7M) CO3

x	5	6	9	11
y	10	13	14	16

(b) 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	9.4511	9.750	10.031

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.1$ (7M) CO3

UNIT – IV

8. (a) Integrate Numerically $\int_0^{\pi/2} \sin\theta\, d\theta$ taken 10 equal parts. (7M) CO4

(b) Find the value of y when $x = 0.1$ if $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 0$ using Taylor's series method. (7M) CO4

(OR)

9. Solve the Laplace Equation $u_{xx} + u_{yy} = 0$
Under the conditions $(h = 1, k = 1)$
$u(0,y) = 0$, $u(4, y) = 12 + y$ for $0 \le y \le 4$
$u(x,0) = 3x$, $u(x, 4) = x^2$ for $0 \le x \le 4$. CO4

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CE221 (R20)

B.TECH. DEGREE EXAMINATION, OCTOBER-2022

Semester IV [Second Year] (Regular)

MATHEMATICS-III

Time: Three hours   Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following in brief:
   (a) Define Laplace transform of a function $f(x)$.   CO1
   (b) State first shifting property of Laplace transform of a function $f(x)$.   CO1
   (c) Find the inverse Laplace transform of $\dfrac{4s+4}{4s^2-9}$ CO1
   (d) Define Fourier cosine transform of $f(x)$.   CO2
   (e) If F(s) is the Fourier transform of f(x) then find $F\{f(ax))$ CO2
   (f) Define inverse Fourier sine transform of a function f(x).   CO2
   (g) Write Newton's forward interpolation formula.   CO3
   (h) Evaluate $\nabla\left(\dfrac{1}{(x+2)}\right)$ CO3
   (i) For what type of data Lagranges interpolation is applicable?   CO3
   (j) State Simpsons rule to evaluate definite integral.   CO4
   (k) Write the formula for k in R-K 4th order method.   CO4
   (l) Write Poisson's equation.   CO4
   (m) Write the formula to find first order derivative using forward differences.   CO4
   (n) Which method is used to solve Laplace equation?   CO4

UNIT – I

2. (a) Find the Laplace transform of $e^{-3t}(2\cos 5t - 3\sin 5t)$ (7M) CO1

   (b) Evaluate the integral by using Laplace transform $\int_0^\infty \dfrac{e^{-t} - e^{-2t}}{t} dt$ (7M) CO1

(OR)

3. (a) Find Inverse Laplace transform of $\dfrac{s}{s^4 + s^2 + 1}$ (7M) CO1

   (b) Using convolution theorem find the inverse Laplace transform of $\dfrac{s^2}{(s^2+4)(s^2+9)}$ (7M) CO1

UNIT – II

4. Solve the differential equation by applying Laplace transform $y'' + 2y' - 3y = \sin t$, $y = y' = 0$ when $t = 0$. CO2

(OR)

5. (a) Find Fourier transform of f(x) defined by $f(x) = \begin{cases} 1-x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$ (7M) CO2

   (b) Find Fourier cosine transform of $\dfrac{e^{-ax}}{x}$ (7M) CO2

UNIT – III

6. (a) Using Newton-Raphson method find the root of the equation $f(x) = e^x - 3x$ that lies between 0 and 1. (7M) CO3

   (b) Construct the difference table for the given data (7M) CO3

x	0	1	2	3	4
f(x)	1.0	1.5	2.2	3.1	4.6

(OR)

7. (a) Using Newton forward and backward interpolation find f(0.5), f(3.5) for the data (7M) CO3

x	0	1	2	3
f(x)	1	3	7	13

   (b) Find the Lagrange's interpolation polynomial for the given data f(0) = 2, f(1) = 3, f(2) = 12, f(5) = 147. (7M) CO3

UNIT – IV

8. (a) Using trapezoidal rule evaluate $\int_0^1 \dfrac{1}{1+x} dx$ and compare with traditional method. (7M) CO4

   (b) Using Eulers method solve for y at x = 2 for $\dfrac{dy}{dx} = 3x^2 + 1$, $y(1) = 2$, take h=0.25. (7M) CO4

(OR)

9. (a) Solve the differential equation $y' = x - y$ given that $y(1) = 0.4$. Find $y(1.2)$ using Runge-Kutta method. (7M) CO4

   (b) What is the classification of the solutions of the partial differential equation $f_{xx} + 2f_{xy} + f_{yy} = 0$. (7M) CO4

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