Code.No: R05012304 | R05 | SET-1

I B.TECH – EXAMINATIONS, DECEMBER - 2010
MATHEMATICS FOR BIOTECHNOLOGISTS
(BIO – TECHNOLOGY)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Find $\lim_{x\to a}\left[\frac{Tanx - Tana}{x-a}\right]$

b) Find the equations of the tangents to the curve $y = 3x^2 - x^3$ where it meets the x-axis. [16]

2.a) Evaluate $\int x^2 \cos x\, dx$

b) Find the area bounded between the curves $y = x^2$ and $y = \sqrt{x}$. [16]

3.a) Solve $x - y + 2z = 4$, $3x + y + 4z = 6$, $x + y + z = 1$ by Matrix Inverson Method.

b) Find Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$ [16]

4.a) Find the differential equations of the family of cardioids $r = a(1+\cos\theta)$ where 'a' is a parameter.

b) Solve $\frac{dx}{dy} = xy + x^2y^3$. [16]

5.a) Solve $(D^3+1)y = \cos(2x-1)$

b) A radio active substance disintegrates at a rate proposonal to its mass. When mass is 10 mgm. The rate of disintegration is 0.051 mgm per day. How long will it take for the mass to be reduced from 10 mgm to 5 mgm? [16]

6. Solve the following system of equations by Gauss seidel iteration method.
$10x + 2y + z = 9$; $x + 10y - z = -22$; $-2x + 3y + 10z = 22$ [16]

7.a) Find the Newton's forward difference interpolating polynomial for the data.

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

b) Evaluate $\int_0^6 \frac{1}{1+x}dx$ by Simpson's $3/8$ rule where $h = 1$. [16]

8.a) Find Laplace transform of:
i) $t^3 e^{2t}\sin t$
ii) $\frac{1-\cos at}{t}$.

b) Solve $(D^2 + 2D + 5)y = e^{-t}\sin t$ given $y = 0, y' = 1$, when $t = 0$. [16]

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Code.No: R05012304 | R05 | SET-2

I B.TECH – EXAMINATIONS, DECEMBER - 2010
MATHEMATICS FOR BIOTECHNOLOGISTS
(BIO – TECHNOLOGY)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Solve $x-y+2z=4$, $3x+y+4z=6$, $x+y+z=1$ by Matrix Inverson Method.

b) Find Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$ [16]

2.a) Find the differential equations of the family of cardioids $r=a(1+\cos\theta)$ where 'a' is a parameter.

b) Solve $\frac{dx}{dy}=xy+x^2y^3$. [16]

3.a) Solve $(D^3+1)y=\cos(2x-1)$

b) A radio active substance disintegrates at a rate proposonal to its mass. When mass is 10 mgm. The rate of disintegration is 0.051 mgm per day. How long will it take for the mass to be reduced from 10 mgm to 5 mgm? [16]

4. Solve the following system of equations by Gauss seidel iteration method.
$10x+2y+z=9$; $x+10y-z=-22$; $-2x+3y+10z=22$ [16]

5.a) Find the Newton's forward difference interpolating polynomial for the data.

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

b) Evaluate $\int_0^6 \frac{1}{1+x}dx$ by Simpson's $3/8$ rule where $h=1$. [16]

6.a) Find Laplace transform of:
i) $t^3e^{2t}\sin t$
ii) $\frac{1-\cos at}{t}$.

b) Solve $(D^2+2D+5)y=e^{-t}\sin t$ given $y=0$, $y'=1$, when $t=0$. [16]

7.a) Find $\lim_{x\to a}\left[\frac{Tanx-Tana}{x-a}\right]$

b) Find the equations of the tangents to the curve $y=3x^2-x^3$ where it meets the x-axis. [16]

8.a) Evaluate $\int x^2\cos x\,dx$

b) Find the area bounded between the curves $y=x^2$ and $y=\sqrt{x}$. [16]

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Code.No: R05012304 | R05 | SET-3

I B.TECH – EXAMINATIONS, DECEMBER - 2010
MATHEMATICS FOR BIOTECHNOLOGISTS
(BIO – TECHNOLOGY)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Solve $\left(D^3+1\right)y=\cos\left(2x-1\right)$

b) A radio active substance disintegrates at a rate proposonal to its mass. When mass is 10 mgm. The rate of disintegration is 0.051 mgm per day. How long will it take for the mass to be reduced from 10 mgm to 5 mgm? [16]

2. Solve the following system of equations by Gauss seidel iteration method.
$10x+2y+z=9$; $x+10y-z=-22$; $-2x+3y+10z=22$ [16]

3.a) Find the Newton's forward difference interpolating polynomial for the data.

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

b) Evaluate $\int_0^6 \frac{1}{1+x}dx$ by Simpson's $3/8$ rule where $h=1$. [16]

4.a) Find Laplace transform of:
i) $t^3e^{2t}\sin t$
ii) $\frac{1-\cos at}{t}$.

b) Solve $\left(D^2+2D+5\right)y=e^{-t}\sin t$ given $y=0$, $y'=1$, when $t=0$. [16]

5.a) Find $\underset{x\to a}{Lim}\left[\frac{Tanx-Tana}{x-a}\right]$

b) Find the equations of the tangents to the curve $y=3x^2-x^3$ where it meets the x-axis. [16]

6.a) Evaluate $\int x^2\cos x\,dx$

b) Find the area bounded between the curves $y=x^2$ and $y=\sqrt{x}$. [16]

7.a) Solve $x-y+2z=4$, $3x+y+4z=6$, $x+y+z=1$ by Matrix Inverson Method.

b) Find Eigen values and Eigen vectors of the matrix $\begin{bmatrix}5&-2&0\\-2&6&2\\0&2&7\end{bmatrix}$ [16]

8.a) Find the differential equations of the family of cardioids $r=a\left(1+\cos\theta\right)$ where 'a' is a parameter.

b) Solve $\frac{dx}{dy}=xy+x^2y^3$. [16]

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Code.No: R05012304 | R05 | SET-4

I B.TECH – EXAMINATIONS, DECEMBER - 2010
MATHEMATICS FOR BIOTECHNOLOGISTS
(BIO – TECHNOLOGY)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Find the Newton's forward difference interpolating polynomial for the data.

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

b) Evaluate $\int_0^6 \frac{1}{1+x}dx$ by Simpson's $3/8$ rule where $h=1$. [16]

2.a) Find Laplace transform of:
i) $t^3 e^{2t}\sin t$
ii) $\frac{1-\cos at}{t}$.

b) Solve $(D^2+2D+5)y = e^{-t}\sin t$ given $y=0$, $y'=1$, when $t=0$. [16]

3.a) Find $\underset{x\to a}{Lim}\left[\frac{Tanx - Tana}{x-a}\right]$

b) Find the equations of the tangents to the curve $y = 3x^2 - x^3$ where it meets the x-axis. [16]

4.a) Evaluate $\int x^2 \cos x\, dx$

b) Find the area bounded between the curves $y = x^2$ and $y = \sqrt{x}$. [16]

5.a) Solve $x - y + 2z = 4$, $3x + y + 4z = 6$, $x + y + z = 1$ by Matrix Inverson Method.

b) Find Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$ [16]

6.a) Find the differential equations of the family of cardioids $r = a(1+\cos\theta)$ where 'a' is a parameter.

b) Solve $\frac{dx}{dy} = xy + x^2 y^3$. [16]

7.a) Solve $(D^3+1)y = \cos(2x-1)$

b) A radio active substance disintegrates at a rate proposonal to its mass. When mass is 10 mgm. The rate of disintegration is 0.051 mgm per day. How long will it take for the mass to be reduced from 10 mgm to 5 mgm? [16]

8. Solve the following system of equations by Gauss seidel iteration method.
$10x + 2y + z = 9$; $x + 10y - z = -22$; $-2x + 3y + 10z = 22$ [16]

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