Code No: 07A3BS01 **R07** **Set No. 2**

II B.Tech I Semester Examinations,MAY 2011
MATHEMATICS - II
Common to CE, CHEM, AE, BT, MMT

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) State and prove Final value theorem.
   (b) Find z [n Cos nθ]. [8+8]

2. (a) Solve the system of non-homogeneous equations x + y + z = 8, 2x + 3y + 2z = 19, 4x + 2y + 3z = 23 using row operations.
   (b) Find whether the following equations will have a non-trivial solution, if so solve them
   3x +4y - z - 6w = 0, 2x + 3y +2z -w = 0
   2x + y - 14z - 9w = 0, x + 3y + 13z + 3w = 0 [8+8]

3. (a) Find Fourier series for f(x) = e^x in $0 < x < 1$
   (b) Find Fourier series for f(x) = x^3 in $0 \leq x \leq \pi$ [8+8]

4. (a) Solve the partial differential equation $q^2 = z^2p^2(1 - p^2)$
   (b) Solve the partial differential equation $z^2 = 1 + p^2 + q^2$ [8+8]

5. Find the Fourier Sine transform of xe^{-ax} [16]

6. Find the Eigen values and eigen vectors of $\begin{bmatrix} 4 & -20 & -10 \\ -2 & 10 & 4 \\ 6 & -30 & -13 \end{bmatrix}$ [16]

7. Solve the laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in a rectangular plate, $0 < x < a$ and $0 < y < b$ satisfying u(x, 0) = 0, u(x, b) = 0, u(0, y) = 0
   u(a, y) = ky(b - y), $0 < y < b$. [16]

8. Diagonalize the following matrices by an Orthogonal transformation. $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ [16]

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Code No: 07A3BS01 **R07** **Set No. 4**

II B.Tech I Semester Examinations,MAY 2011
MATHEMATICS - II
Common to CE, CHEM, AE, BT, MMT

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Solve the laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in a rectangular plate, $0 < x < a$ and $0 < y < b$ satisfying u(x, 0) = 0, u(x, b) = 0, u(0, y) = 0
u(a, y) = ky(b - y), $0 < y < b$. [16]

2. (a) State and prove Final value theorem.
(b) Find z [n Cos nθ]. [8+8]

3. (a) Solve the partial differential equation $q^2 = z^2p^2(1 - p^2)$
(b) Solve the partial differential equation $z^2 = 1 + p^2 + q^2$ [8+8]

4. Diagonalize the following matrices by an Orthogonal transformation. $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ [16]

5. (a) Find Fourier series for f(x) = e^x in $0 < x < 1$
(b) Find Fourier series for f(x) = x^3 in $0 \leq x \leq \pi$ [8+8]

6. Find the Fourier Sine transform of xe^{-ax} [16]

7. Find the Eigen values and eigen vectors of $\begin{bmatrix} 4 & -20 & -10 \\ -2 & 10 & 4 \\ 6 & -30 & -13 \end{bmatrix}$ [16]

8. (a) Solve the system of non-homogeneous equations x + y + z = 8, 2x + 3y + 2z = 19, 4x + 2y + 3z = 23 using row operations.
(b) Find whether the following equations will have a non-trivial solution, if so solve them
3x +4y - z - 6w = 0, 2x + 3y +2z -w = 0
2x + y - 14z - 9w = 0, x + 3y + 13z + 3w = 0 [8+8]

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Code No: 07A3BS01 **R07** **Set No. 1**

II B.Tech I Semester Examinations,MAY 2011
MATHEMATICS - II
Common to CE, CHEM, AE, BT, MMT

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) State and prove Final value theorem.
   (b) Find z [n Cos nθ]. [8+8]

2. (a) Solve the partial differential equation $q^2 = z^2p^2(1 - p^2)$
   (b) Solve the partial differential equation $z^2 = 1 + p^2 + q^2$ [8+8]

3. Diagonalize the following matrices by an Orthogonal transformation. $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ [16]

4. Find the Eigen values and eigen vectors of $\begin{bmatrix} 4 & -20 & -10 \\ -2 & 10 & 4 \\ 6 & -30 & -13 \end{bmatrix}$ [16]

5. Find the Fourier Sine transform of xe^{-ax} [16]

6. Solve the laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in a rectangular plate, $0 < x < a$ and $0 < y < b$ satisfying u(x, 0) = 0, u(x, b) = 0, u(0, y) = 0
   u(a, y) = ky(b - y), $0 < y < b$. [16]

7. (a) Solve the system of non-homogeneous equations x + y + z = 8, 2x + 3y + 2z = 19, 4x + 2y + 3z = 23 using row operations.
   (b) Find whether the following equations will have a non-trivial solution, if so solve them
   3x +4y - z - 6w = 0, 2x + 3y +2z -w = 0
   2x + y - 14z - 9w = 0, x + 3y + 13z + 3w = 0 [8+8]

8. (a) Find Fourier series for f(x) = e^x in $0 < x < 1$
   (b) Find Fourier series for f(x) = x^3 in $0 \le x \le \pi$ [8+8]

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Code No: 07A3BS01 **R07** **Set No. 3**

II B.Tech I Semester Examinations,MAY 2011
MATHEMATICS - II
Common to CE, CHEM, AE, BT, MMT

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Find the Eigen values and eigen vectors of $\begin{bmatrix} 4 & -20 & -10 \\ -2 & 10 & 4 \\ 6 & -30 & -13 \end{bmatrix}$ [16]

2. (a) State and prove Final value theorem.
   (b) Find z [n Cos nθ]. [8+8]

3. (a) Solve the partial differential equation $q^2 = z^2p^2(1 - p^2)$
   (b) Solve the partial differential equation $z^2 = 1 + p^2 + q^2$ [8+8]

4. (a) Solve the system of non-homogeneous equations x + y + z = 8, 2x + 3y + 2z = 19, 4x + 2y + 3z = 23 using row operations.
   (b) Find whether the following equations will have a non-trivial solution, if so solve them
   3x +4y - z - 6w = 0, 2x + 3y +2z -w = 0
   2x + y - 14z - 9w = 0, x + 3y + 13z + 3w = 0 [8+8]

5. (a) Find Fourier series for f(x) = e^x in $0 < x < 1$
   (b) Find Fourier series for f(x) = x^3 in $0 \leq x \leq \pi$ [8+8]

6. Diagonalize the following matrices by an Orthogonal transformation. $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ [16]

7. Solve the laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in a rectangular plate, $0 < x < a$ and $0 < y < b$ satisfying u(x, 0) = 0, u(x, b) = 0, u(0, y) = 0
   u(a, y) = ky(b - y), $0 < y < b$. [16]

8. Find the Fourier Sine transform of xe^{-ax} [16]

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