Roll No. | | | | | | | | | | |

Total No. of Pages :02

Total No. of Questions : 09

B.Tech. (AI&DS/AI&ML/Block Chain/CE/IOT/CSE/EEE/CS/EE/ECE/FT/IT /ME/CSD/ETE/DS/R&AI/Internet of Things and Cyber Security Including Block chain Technology) (Sem.–1)

# ENGINEERING MATHEMATICS-I

Subject Code : BTAM101-23

M.Code : 93796

Date of Examination : 03-06-2025

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select at least TWO questions from SECTION - B & C.

## SECTION - A

1. **Write short notes on :**

a) Explain absolute convergence of improper integrals of second kind.

b) Evaluate the triple Integral $\int_0^2 \int_0^2 \int_0^{yz} xyz\,dx\,dy\,dz$.

c) Evaluate $\int_0^1 \int_{x^2}^{x} dy\,dx$

d) State homogeneous function.

e) If $f(x, y) = x^2y + xy^3 - 3x + 4y - 6$, find $\frac{\partial f}{\partial x}$

f) Define conditionally convergent series.

g) State Integral Test.

h) Compute $\Gamma\left(-\frac{3}{2}\right)$.

i) Prove symmetry of beta function.

j) State Taylor's theorem.

## SECTION - B

2. Show that the function $\int_0^\infty x^{n-1} e^{-x}\, dx$ is convergent if and only if $n > 0$.

3. Test the convergence of $x + \frac{2^2 x^2}{2!} + \frac{3^3 x^3}{3!} + \frac{4^4 x^4}{4!} \ldots\ldots\ldots\ldots \infty$.

4. Discuss the convergence or divergence of the series $\sum \frac{n^p}{(n+1)^q}$.

5. Find the volume of the solid generated by revolving the curve $x = 2t + 3$, $y = 4t^2 - 9$ about the x axis for $2t = -3$ to $2t = 3$.

## SECTION-C

6. If $\theta = t^n e^{\frac{-r^2}{4t}}$, find the value of n which will make $\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial \theta}{\partial r}\right) = \frac{\partial \theta}{\partial t}$.

7. If $U = Cosec^{-1}\left(\frac{x^{\frac{1}{2}} + y^{\frac{1}{2}}}{x^{\frac{1}{3}} + y^{\frac{1}{3}}}\right)^{\frac{1}{2}}$, Prove that

$$x^2 \frac{\partial^2 U}{\partial y^2} + 2xy \frac{\partial^2 U}{\partial x \partial y} + y^2 \frac{\partial^2 U}{\partial y^2} = \frac{13 + \tan^2 U}{144}$$

8. Find the volume common to the cylinders $x^2 + y^2 = a^2$ and $x^2 + z^2 = a^2$.

9. Evaluate $\iint (x^2 + y^2)\, dx\, dy$ throughout the area enclosed by the curve

$y = 4x$, $x + y = 3$, $y = 0$ and $y = 2$.

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**

Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

**B.Tech. (AI & ML/DS)(CE/CSE/IT/ETE/EEE/ECE/EE/DS/CSD)/(Robotics & Artificial Intelligence) (Internet of Things and Cyber Security including Block Chain Technology)(Block Chain)(ME)(FT)(Sem.–1)**

**ENGINEERING MATHEMATICS-I**

**Subject Code : BTAM101/23**

**M.Code : 93796**

**Date of Examination : 16-12-2024**

**Time : 3 Hrs.**

**Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C. have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

## SECTION-A

**1. Write briefly :**

a) Define oscillatory sequence with the help of an example.

b) Show that the series $1+\frac{1}{2}+\frac{1}{2^2}+\frac{1}{2^3}+\ldots\ldots\frac{1}{2^{n-1}}$ ..... converges to the sum 2.

c) Define Comparison Test for the series.

d) Find the length of the arc of the curve $y = x^{\frac{2}{3}}$ from $x = -1$ to $x = 8$.

e) Test for convergence of integral $\int_1^{\infty}\frac{\log x}{x^2}\,dx$.

f) Define Gamma function.

g) What is Homogenous function? Give an example.

h) Evaluate $\lim_{\substack{x\to 1\\ y\to 2}}\frac{2x^2y}{x^2+y^2+1}$.

Research & Technology Institute of Technology LIBRARY MCC No.



i) Evaluate $\int_0^2\int_0^{y^2} e^{x/y}\,dx\,dy$.

j) Evaluate $\int_0^1\int_0^{\sqrt{1-x^2}}\int_0^{\sqrt{1-x^2-y^2}} xyz\,dz\,dy\,dx$.

## SECTION-B

2. Prove that the sequence $\{a_n\}$ where $a_n=\left(1+\frac{1}{n}\right)^n$ is convergent.

3. Discuss the convergence or divergence of the series $\sqrt{\frac{1}{2^3}}+\sqrt{\frac{2}{3^3}}+\sqrt{\frac{3}{4^3}}+\ldots\ldots\ldots$

4. Find the area of the surface of revolution formed by the curve $r = 2a\cos\theta$ about the initial line.

5. Prove that $\beta(m,n)=\frac{\Gamma(m).\Gamma(n)}{\Gamma(m+n)}$ where $m>0, n>0$.

## SECTION-C

6. If $V=(x^2+y^2+z^2)^{\frac{1}{2}}$, prove that $x\frac{\partial V}{\partial x}+y\frac{\partial V}{\partial y}+z\frac{\partial V}{\partial z}=-V$.

7. By Taylor's theorem, expand $e^x \sin y$ in power of x and y up to third degree term.

8. Evaluate $\int_0^1\int_0^{\sqrt{1-x^2}} y^2\,dy\,dx$, by change of order of integration.

9. Find the volume of the tetrahedron bounded by the coordinate planes and the plane $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**

Roll No. | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

**B.Tech. (AI & ML/DS)(CE)(CSE)(IT)(CSE and Design) (EE) (ECE) (EEE)(Robotics & Artificial Intelligence) (Internet of Things and Cyber Security including Block Chain Technology)(Block Chain)(ME)(FT)(Sem.–1)**

# ENGINEERING MATHEMATICS-I

**Subject Code : BTAM101/23**
**M.Code : 93796**
**Date of Examination : 08-05-2024**

**Time : 3 Hrs.** **Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

## SECTION-A

**1. Answer briefly :**

a) What do you mean by convergent sequence?

b) Prove that the sequence $\left\{\frac{2n-7}{3n+2}\right\}$ is bounded.

c) Prove that $\sum\left(\frac{n}{n+1}\right)^2$ is divergent.

d) Find the length of the arc of the parabola $2y = x^2$ from $x = a$ to $x = b$.

e) Test for convergence of integral $\int_{e^2}^{\infty} \frac{dx}{x\log(\log x)}$.

f) Define Beta function.

g) Find first order partial derivative of $u = \tan^{-1}\frac{x^2+y^2}{x+y}$.



(52)-1377

h) Show that the function $f(x,y) = \frac{xy^2}{x^2+y^4}$ has no limit as $(x, y) \to (0,0)$.

i) Evaluate $\int_0^1 \int_x^{\sqrt{x}} (x^2+y^2)\,dy\,dx$.

j) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} x\,y\,z\,dx\,dy\,dz$.

## SECTION-B

2. Prove that the sequence $\{a_n\}$ where $a_n = 1 + \frac{1}{2} + \frac{1}{3} \ldots\ldots \frac{1}{n} - \log n$ is convergent.

3. Discuss the convergence or divergence of the series $\sum_{n=1}^{\infty} \frac{1}{n}\sin\frac{1}{n}$.

4. The curve $r = a(1+\cos\theta)$ revolves about the initial line. Find the volume of the figure formed.

5. Prove that $\beta(m,n) = \int_0^1 \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}\,dx$ where $m > 0$, $n > 0$.

## SECTION-C

6. If $u = x^3 + y^3 + z^3 + 3xyz$, show that $x\frac{\partial V}{\partial x} + y\frac{\partial V}{\partial y} + z\frac{\partial V}{\partial z} = 3u$

7. Obtain Taylor's expansion for $f(x,y) = y^x$ at (1, 1) up to second-degree term.

8. Evaluate $\int_0^1 \int_{x^2}^{2-x} xy\,dx\,dy$, by change of order of integration.

9. Find the volume of the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student**



(52)-1377

Institute of Technology & Research LIBRARY ACC No.....

Roll No. | | | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

**B.Tech. (AI & DS/ AI & ML/ Block Chain / CSE / CE / CS / Computer Science and Design / EEE / EE / ECE / Electronics & Telecommunication Engineering / FT / IT / ME / Robotics & Artificial Intelligence/ Internet of Things and Cyber Security including Block Chain Technology) (Sem.– 1)**

# ENGINEERING MATHEMATICS-I

**Subject Code : BTAM101-23**

**M.Code : 93796**

**Date of Examination: 08-12-2023**

**Time : 3 Hrs.** **Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

## SECTION-A

**1. Answer briefly :**

a) What do you mean by bounded and unbounded sequences?

b) Prove that the sequence $\frac{2n-7}{3n+2}$ is monotonically increasing.

c) Define $p$-Test for the series.

d) Find the length of the arc of the parabola $x^2 = 4ay$ extending from the vertex to one extremity of the latus rectum.

e) Test for convergence of integral $\int_0^{\infty} \frac{\sin^2 x}{x^2} dx$.

f) Define Beta function.

g) State Euler's theorem for homogeneous function.

h) Show that the function $f(x,y) = \frac{2x^2 y}{x^4 + y^2}$ has no limit as $(x, y) \to (0, 0)$.



i) Evaluate $\int_1^{\log 8} \int_0^{\log y} e^{x+y} dx\, dy$

j) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{2-x} x\, y\, z\, dz\, dy\, dx$.

## SECTION-B

2. Prove that the sequence $a_n$ where $a_n = \frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} \ldots\ldots \frac{1}{2n}$ is convergent.

3. Discuss the convergence or divergence of the series $\frac{1}{1.2.3} + \frac{2}{2.3.4} + \frac{5}{3.4.5} + \ldots\ldots$

4. Find the surface of the solid generated by the revolution of the ellipse $x^2 + 4y^2 = 16$ about its major axis.

5. Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$ where $m > 0, n > 0$.

## SECTION-C

6. If $V = r^m$ where $r^2 = x^2 + y^2 + z^2$, show that $\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} + \frac{\partial^2 V}{\partial z^2} = m(m+1)r^{m-2}$.

7. Show that the first four terms of the Maclaurin's expansion of $e^{ax} \cos by$ are :

$$1 + ax + \frac{1}{\lfloor 2}(a^2x^2 - b^2y^2) + \frac{1}{\lfloor 3}(a^3x^3 - 3ab^2xy^2).$$

8. Evaluate $\int_0^{\infty} \int_0^x xe^{-x^2/y}\, dy\, dx$ by change of order of integration.

9. Evaluate $\iiint \frac{dx\, dy\, dz}{(x+y+z+1)^3}$ over the region $x \geq 0,\ y \geq 0,\ z \geq 0,\ x + y + z \leq 1$.

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**



IKG Institute of Technology & Research • Jalandhar • LIBRARY ACC No.....

Roll No. | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

**B.Tech. (AI & DS/ AI & ML/ Block Chain / CSE / CE / CS / Computer Science and Design / EEE / EE / ECE / Electronics & Telecommunication Engineering / FT / IT / ME /Robotics & Artificial Intelligence/ Internet of Things and Cyber Security including Block Chain Technology) (Sem.– 1)**

## ENGINEERING MATHEMATICS-I

**Subject Code : BTAM101-23**
**M.Code : 93796**
**Date of Examination: 08-12-2023**

**Time : 3 Hrs.** **Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

### SECTION-A

1. **Answer briefly :**

a) What do you mean by bounded and unbounded sequences?

b) Prove that the sequence $\frac{2n-7}{3n+2}$ is monotonically increasing.

c) Define $p$-Test for the series.

d) Find the length of the arc of the parabola $x^2 = 4ay$ extending from the vertex to one extremity of the latus rectum.

e) Test for convergence of integral $\int_0^{\infty} \frac{\sin^2 x}{x^2} dx$.

f) Define Beta function.

g) State Euler's theorem for homogeneous function.

h) Show that the function $f(x,y) = \frac{2x^2 y}{x^4 + y^2}$ has no limit as $(x, y) \to (0, 0)$.



i) Evaluate $\int_1^{\log 8} \int_0^{\log y} e^{x+y} dx\, dy$

j) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{2-x} x\, y\, z\, dz\, dy\, dx$.

### SECTION-B

2. Prove that the sequence $a_n$ where $a_n = \frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} \ldots\ldots \frac{1}{2n}$ is convergent

3. Discuss the convergence or divergence of the series $\frac{1}{1.2.3} + \frac{2}{2.3.4} + \frac{5}{3.4.5} + \ldots\ldots$

4. Find the surface of the solid generated by the revolution of the ellipse $x^2 + 4y^2 = 16$ about its major axis.

5. Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$ *where* $m > 0, n > 0$.

### SECTION-C

6. If $V = r^m$ *where* $r^2 = x^2 + y^2 + z^2$, show that $\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} + \frac{\partial^2 V}{\partial z^2} = m(m+1) r^{m-2}$.

7. Show that the first four terms of the Maclaurin's expansion of $e^{ax}\cos by$ are

$1 + ax + \frac{1}{\lfloor 2}(a^2x^2 - b^2y^2) + \frac{1}{\lfloor 3}(a^3x^3 - 3ab^2xy^2)$.

8. Evaluate $\int_0^{\infty} \int_0^{x} xe^{-x^2/y}\, dy\, dx$ by change of order of integration.

9. Evaluate $\iiint \frac{dx\, dy\, dz}{(x+y+z+1)^3}$ over the region $x \geq 0,\ y \geq 0,\ z \geq 0,\ x + y + z \leq 1$

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student**



LIBRARY ACC No.

Roll No. | | | | | | | | | | |

Total No. of Questions : 18

Total No. of Pages : 02

**B.Tech. (2012 to 2017) (Sem.–1)**

# ENGINEERING MATHEMATICS-I

**Subject Code : BTAM-101**

**M.Code : 54091**

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

## SECTION-A

**Solve the following :**

1. Define point of inflexion.
2. Find total derivative of $z = tan^{-1}\left(\frac{x}{y}\right)$.
3. Using differentials, find appropriate value of $\sqrt{(298)^2+(401)^2}$.
4. Find volume of unit sphere using triple integral.
5. Find the directional derivative of $f(x, y, z) = xy^2 + 4xyz + z^2$ at point (1, 2, 3) in direction of $3\hat{i} + 4\hat{j} - 5\hat{k}$
6. Prove curl (grad f) = 0, where $f$ is differentiable scalar field.
7. State Gauss divergence theorem.
8. Find the work done by the force $F = -xy\hat{i} + y^2\hat{j} + z\hat{k}$ in moving a particle over the circular path $x^2 + y^2 = 4$, $z = 0$ from (2, 0, 0) to (0, 2, 0).
9. Evaluate $\iint (x^2 + y^2)\, dxdy$ over the unit circle.
10. Find $\frac{dy}{dx}$ when $x^x + y^x = \alpha$, where $\alpha$ is any constant.



## SECTION-B

11. If $u = \sin^{-1}\left(\frac{x^3 + y^3 + z^3}{ax + by + cz}\right)$, then prove that $xu_x + yu_y + zu_z = 2 \tan u$.
12. A rectangular box open at top is to have volume of 32 cubic feet. Find dimensions of box requiring least material for its construction.
13. a) Find length of four cusped hypocycloid $x = a\cos^3\theta$, $y = b\sin^3\theta$.

    b) Find volume generated by revolution of cardiod $r = a(1 - \cos\theta)$ about $x$ axis.
14. Find the curvature at point $\left(\frac{3a}{2}, \frac{3a}{2}\right)$ of curve $x^3 + y^3 = 3axy$.

## SECTION-C

15. Evaluate the surface integral $\iint F.n\, dA$ where $F = 6z\hat{i} + 6\hat{j} + 3y\hat{k}$ and S is the portion of the plane $2x + 3y + 4z = 12$, which is in the first octant?
16. Give physical interpretation of divergence.
17. Verify Stoke's theorem for vector field $V = (3x - y)\hat{i} - 2yz^2\hat{j} - 2y^2z\hat{k}$ where S is surface of sphere $x^2 + y^2 + z^2 = 16$, $z > 0$.
18. Evaluate $\iiint \frac{dxdydz}{\sqrt{1 - x^2 - y^2 - z^2}}$, over the region $x^2 + y^2 + z^2 = 1$.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**

Roll No. | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

**B.Tech. (2011 Onwards) (Sem.–1)**
**ENGINEERING MATHEMATICS – I**
**Subject Code : BTAM-101**
**Paper ID : [A1101]**

**Time : 3 Hrs.** **Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C. have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**
5. **Symbols used have their usual meanings. Statistical tables, if demanded, may be provided.**

## SECTION-A

**1. Solve the following :**

a) Find asymptotes, parallel to axes, of the curve : $xy + 2y - 3x + 1 = 0$

b) Let $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ be a given ellipse. Write its area in the form of a double integral.

c) Find the value of $\frac{\partial(r,\theta)}{\partial(x,y)}$, where $x = r\cos\theta$ & $y = r\sin\theta$.

d) If an error of 1% is made in measuring the side of a square, what is the percentage error in its area?

e) Is the function $f(x,y) = \frac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}}$ homogeneous? If yes, what is its degree?

f) What is the value of $\int_0^3 \int_0^1 (x^2 + 3y^2)dydx$?

g) Give geometrical interpretation of $\int_0^1 \int_x^x dydx$

h) Show that for the vector field $\vec{F} = x^2 i + y^2 j + z^2 k$, $\nabla\cdot(\nabla\times\vec{F}) = 0$.

i) For $\phi(x,y,z) = x\cos(x + y + z)$, compute $\nabla\times(\nabla\phi)$.

j) Evaluate $\int_C xyds$ over the curve C given by $x = 4\cos t$, $y = 4\sin t$, $z = -3$; $0 \le t \le \pi/2$.



## SECTION-B

2. Trace the following curves by giving their salient feature :

a) $x^2y^2 = a^2(y^2 - x^2)$.

b) $r = a(\sec\theta + \cos\theta)$, $a > 0$.

3. a) Find the length of the arc of the cycloid $x = a(\theta - \sin\theta)$, $y = a(1 + \cos\theta)$, $0 \le \theta \le \pi$.

b) Use definite integral to find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.

4. a) If $u = \log\left(\sqrt{x^2 + y^2 + z^2}\right)$, show that $(x^2 + y^2 + z^2)\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}\right) = 1$.

b) State Euler's theorem for homogeneous functions and verify it for $u = \sin^{-1}(x/y) + \tan^{-1}(y/x)$.

5. a) Find the maximum and minimum distances from the origin to the curve $5x^2 + 6xy + 5y^2 - 8 = 0$.

b) If $u = \frac{x}{y-z}, v = \frac{y}{z-x}, w = \frac{z}{x-y}$, show that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 0$.

## SECTION-C

6. a) Evaluate the following integral by changing the order of integration :

$$\int_0^1 \int_x^{\sqrt{x}} (x^2 + y^2)dxdy$$

b) Evaluate the triple integral $\int_1^3 \int_{1/x}^1 \int_0^{\sqrt{xy}} xyzdzdydx$.

7. a) Find a unit vector normal to the surface $x^3 + y^2 + 3xyz = 3$ at the point $(1, 2, -1)$

b) Show that the vector field $\vec{F}(x,y,z) = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational.

8. a) Calculate the work done by $\vec{F}(x,y,z) = i - yj + xyzk$ in moving the particle from $(0,0,0)$ to $(1,-1,1)$ along the curve $x = t$, $y = -t^2$, $z = t$ for $0 \le t \le 1$.

b) Compute $\int_S \vec{F}\cdot\hat{N}ds$, where $\vec{F} = x\hat{i} + (z^2 - zx)\hat{j} - xy\hat{k}$ and S is the triangular surface with vertices $(1,0,0)$, $(0,1,0)$ and $(0,0,2)$.

9. What do you mean by conservative vector field? Find the scalar potential of the conservative vector field $\vec{F}(x,y) = (2x\cos 2y)i - (2x^2\sin 2y + 4y^3)j$.

LIBRARY
Thapar Institute of Technology & Research
Patiala