*New College*

# Vector Calculus

**B.A / B.Sc - I**
**Semester - II**

## JEEVANSONS PUBLICATIONS

# SYLLABUS

## K.U., Kurukshetra, C.D.L.U., Sirsa and G.J.U., Hissar

## B.A. / B. Sc. 1st Year

### SECOND SEMESTER

### VECTOR CALCULUS : (BM - 123)

*Maximum Marks* : B.Sc. – 40
B.A. – 27

*Time Allowed* : 3 Hours

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**Note.** *The examiner is requested to set **nine questions** in all, selecting two questions from each section and **one compulsory question** consisting of five parts distributed over all the four sections. Candidates are required to attempt five questions, selecting at least one question from each section and the compulsory question.*

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### Section - I

Scalar and Vector product of three vectors, Product of four vectors. Reciprocal vectors. Vector differentiation, Scalar valued point functions, Vector valued point functions, derivative along a curve, directional derivatives.

### Section - II

Gradient of a scalar point function, geometrical interpretation of grad $\phi$, character of gradient as a point function. Divergence and curl of vector point function, characters of div $\vec{f}$ and curl $\vec{f}$ as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator.

### Section - III

Orthogonal curvilinear co-ordinates. Conditions for orthogonality. Fundamental triad of mutually orthogonal unit vectors. Gradient, divergence, curl and laplacian operators in terms of orthogonal curvilinear co-ordinates, cylindrical co-ordinates, spherical co-ordinates.

### Section - IV

Vector integration, line integral, surface integral, volume integral
Theorem of Gauss, Green, Stokes and problems based on these.

# SYLLABUS

## M.D.U., Rohtak, C.B.L.U., Bhiwani and I.G.U., Meerpur, Rewari

## B.A. / B. Sc. 1st Year

### SECOND SEMESTER

### VECTOR CALCULUS : (BM - 123)

Maximum Marks : B.Sc. – 40    Time Allowed : 3 Hours
  B.A. – 26

**Note.** *The question paper will consist of **five** sections. Each of the first four sections will contain two questions and the students shall be asked to attempt **one** question from each section. **Section – V** will contain **six** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory.***

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