**ANNUAL EXAMINATION 2020**

**(Only for Regular Students)**

***Centre No. 135 Centre Name- Disha College, Raipur (C.G.)***

**Class-B.Sc.-I Subject- Mathematics**

**Paper No-III Paper Name- Vector Analysis & Geometry**

**Time- 3 hrs. M.M.-50**

Note – *Attempt all units. Solve any two from each units. Each question carries equal marks*.

Unit-I

Q1. ;fn r2=x2 + y2 + z2 rc rn dk eku Kkr dhft,A

If r2=x2 + y2 + z2 then find grad rn

Q2. ;fn rks Kkr dhft,A

If find curl

Q3. ;fn , rFkk rks lR;kfir dhft,

fd

If ,and then verify

that

Unit-II

Q1. lery esa xzhu çes; dk lR;kiu ds fy, dhft, tgkWa C o`Rr x2+y2 = 1 gSA

Use green's theorem in plane to evaluate where C is the circle x2+y2 = 1.

Q2. eku Kkr dhth, odz C, xy ry esa ,d vk;r gS

tks y=0, x=a, y=b, x=0 ls f?kjk gSA

Evaluate where and

C is the rectangle in the xy plone bounded by y=0, x=a, y=b, x=0.

Q3. xkml MkbotsZUl dk lR;kiu dhft,]

tgkW S funsZ'kkad leryksa o lery x = y = z = a ls ifjc) ?ku dk i`"B gSA

Verify gauss divergenc theorem over the surface of cube bounded by co-ordinate planes and the planes x = y = z = a,

Unit-III

Q1. Trace the parabola. 9x2 + 24xy + 16y2 - 2x +14y + 1 = 0 and find the coordinates of its focus and the equation to its directrix.

ijoy;% 9x2+24xy+16y2-2x+14y+1=0 dk vuqjs[k.k dhft, rFkk blds ukfHk ds funsZ’kkad vkSj fu;rk dk lehdj.k çkIr dhft,A

Q2. n'kkZb;s fd js[kk 'kkado dks Li'kZ djsxk ds fy, çfrcU/k (A-e)2 + B2 = 1gSA

Show that the condition that the line may touch the conic

is (A-e)2 + B2 = 1

Q3. fl) dhft, fd nh?kZo`Rr ds fcUnq ls [khaps x, vfoijoy; dk lehdj.k ftldk mRdsUnz dks.k gS vkSj tks nh?kZo`Rr ls laukfHk gSA

Prove that the equation to the hyperbola drawn though point on the

ellipse whose eccentric angle is and which is confocal with

the ellipse is

Unit-IV

Q1. ljy js[kkvksa rFkk ds chp dh U;wure nwjh dh eki rFkk U;wure nwjh dh ljy js[kk dk lehdj.k Kkr dhft,A

Find length and equation to the shortest distance between the lines and

Q2. ml 'kadq dk lehdj.k Kkr dhft, ftldk 'kh"kZ vkSj vk/kkj oØ ax2 + by2 =1, z = 0

gSA

Find the equation of the cone whose vertex is and base curve

ax2 + by2 =1, z = 0

Q3. ml csyu dk lehdj.k Kkr dhft, ftlds tud ds lekarj gS rFkk vk/kkj

oØ x2 + 2y2 = 1, z = 3 gSA

Find the equation of the cylinder whose generators are parallel to the line

and whose guiding curve is the ellipse x2 + 2y2 = 1, z = 3

Unit-V

Q1. Find the equation to the generators of the hyperboloid

Which pass through the point (a cos, bsin,0)

vfrijoy;t ds fcUnq (a cos, bsin,0) ls tkus okys tudksa ds lehdj.k Kkr dhft,A

Q2. 'kkadot ax2 + by2 + cz2 = 1 ds fcUnq ( ij Li'kZ rt dk lehdj.k Kkr dhft,A

Find equation of tangent plane at ( to the conicoid ax2 + by2 + cz2 = 1

Q3. fl) dhft, fd fdlh fLFkj fcUnq ls ,d ijoy;t ij ik¡p vfHkyEc [kkhaps tk ldrs gSA

Prove that five normals can be drawn from a fixed point to the paraboloid.

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