UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Second Semester – 2019

PAPER: Calculus (IT)-II

Course Code: MATH-132 / IT-12392 Part – I (Compulsory) Time: 30 Min. Marks: 10

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.
Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (10x1=10)

1. $\nabla\cdot$ is termed as.

a) divergence operator b) gradient operator c) curl operator d) Both a and b

2. In Maxwell's equation, $\nabla\cdot D=\rho_{ev}$; $\nabla\cdot$ is

a) Divergence operator b) Scaler operator c) information not complete d) Arc function

3. Vector operator that produces a scalar field giving quantity of a vector field's source at each point is called

a) Divergence operator b) Curl operator c) Double gradient operator d) Null vector

4. The gradient of $xi + yj + zk$ is

a) 0 b) 1 c) 2 d) 3

5. Curl of gradient of a vector is

a) Unity b) Zero c) Null vector d) Depends on the constants of the vector

6. Find the divergence of the vector $yi + zj + xk$.

a) -1 b) 0 c) 1 d) 3

7. Find whether the vector is solenoidal, $\mathbf{E} = yz\,i + xz\,j + xy\,k$

a) Yes, solenoidal b) No, non-solenoidal

c) Solenoidal with negative divergence d) Variable divergence

8. Divergence of gradient of a vector function is equivalent to

a) Laplacian operation b) Curl operation c) Double gradient operation d) Null vector

9. The curl of a curl of a vector gives a

a) Scalar b) Vector c) Zero value d) Non zero value

10. A field in which a test charge around any closed surface in static path is zero is called

a) Solenoidal b) Rotational c) Irrotational d) Conservative

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B.S. 4 Years Program / Second Semester – 2019

Roll No. .....

PAPER: Calculus (IT)-II

Course Code: MATH-132 / IT-12392 Part – II **Time: 2 Hrs. 30 Min. Marks: 50**

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Question no: 2

Attempt all short questions. (4 X 5 = 20)

1. Define and explain with diagrams that the increasing and decreasing functions are opposite in nature?
2. Define the planes in 3-space with help of diagram.
3. Define parametric equation of lines.
4. Show that the function $f(x,y) = x \sin(y/x) - y \cos(x/y)$ is homogeneous of degree 1.
5. Prove that the divergence theorem holds good for any vector valued function.

Question no: 3

Attempt all long questions. (3 X 10 = 30)

1. State and prove the Eulers's Theorem.
2. State and prove the Stoke's Theorem.
3. Find the slope to the tangent to the hyperbola $x^2 - 4xy - 3y^2 - 9$ at the point (2,-1).