**Gandaki College of Engineering and Science**

**Final Internal Assessment**

Level: Bachelor Semester : Fall Year: 2019

Programme: BE F.M: 100

Course: Eng Maths III

Candidates are required to give their answer in their own words as far as practicable. The figure in the margin indicates the full marks.

Attempt all these questions.

Q N 1 a) Without expanding prove that (8)

= ( b2 - ac ) ( ax2 +2bxy +cy2 )

Or

Prove that (AB) t = Bt At where A and B are matrices of specific order

b) Test consistency and solve (7)

x + y + z = 3

x + 2y + 3z = 4

2x + 3y + 4z = 7

Q N 2 a) Find Eigen value and Eigen vector of matrix (8)

b) Solve by using dual simplex method the following problem (7)

Minimize z = 4X1 + 4X2 + 6X3 subject to

X1 - X2 +X3 ≥ 1

-X1 + X2 +X3 ≥ 2

X1 , X2,  X3 ≥ 0

Q N 3 a) Prove that the infinite series is convergent if p > 1 and divergent if p ≤ 1 (7)

b) Find the radius and interval of convergence for the series (8)

or

Expand using maclaurines series

Q N 4 a) Find the Fourier series expansion of f(x) = for -2 < x < 2 (8)

b) Find the directional derivative of f = - 3 at (2, -1, 2) along z axis. (7)

Q N 5 a) Calculate where F = ( y2 - x2 ) c: y = 4x2 from (0,0) to (1,4) (7)

b) Prove that necessary and sufficient condition for the vector valued function a of the scalar variable

t to have constant direction is = 0 (8)

Q N 6 a) State Greens theorem and use it to evaluate counter clockwise around the boundary line

C of the region R, where F = (siny, cosx), R is the triangele with the vertices (0, 0), (π, 0), (π, 1) (8)

b) Evaluate where F = (x2,ey ,1) S: x+y+z = 1 x ≥ 0 , y ≥ 0 , z ≥ 0 (7)

Q N 7 Attempt all questions 4 x 2.5 = 10

1. Let T: R2 →R be defined by T ( x,y) = x + y check whether T is linear or not

1. Show that = is divergent
2. Find the smallest period of the function f(x) =
3. Find the divergence of V = x2i + y2j + z2k

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