

## INSTRUCTIONS FOR THE STUDENTS

1. Students should solve the Assignment on A4 Size Paper.
2. Four Questions are to be attempted by selecting one question from each unit. All questions carry equal marks.
3. Students are required to submit the solved Assignment(s) either by post or in person in the Directorate of Distance Education, M.D. University, Rohtak by 28.02.2021.
4. The student should fill his/her particulars in the following format on first page of solved Assignment:

Name of the Programme \_\_\_\_\_ Nomenclature of the Paper \_\_\_\_\_

Paper Code: \_\_\_\_\_ Academic Session \_\_\_\_\_

Student ID: \_\_\_\_\_ Name of Student \_\_\_\_\_

Date of Submission of Solved Assignment \_\_\_\_\_

\_\_\_\_\_  
Signature of the Student

**B.A FIRST SEMESTER**  
**Mathematics (BA-1007-1)**

**Maximum Marks : 20**

**Time:**

**All questions are compulsory.**

- 1.** Find the non-singular matrices P and Q such that PAQ is in normal form, where

$$A = \begin{pmatrix} 2 & 2 & 6 \\ -1 & 2 & 2 \end{pmatrix}$$

Or

Find the condition that  $x^4 + px^3 + qx^2 + rx + r = 0$  is equal to zero.

- 2.** Find the latus rectum, equation of axis, tangent at the vertex and vertex of the parabola  $4x^2 - 4xy + y^2 - 10y - 19 = 0$

Or

Find the equation of the right circular cylinder of radius 2 whose axis passes through (1,2,3) and has direction cosines proportional to 2, -3, 6.

- 3.** If  $y = \sin(m \sin^{-1}x)$ ,  $|x| < 1$ , prove that  $(1 - x^2)y_{n+2} - (2x + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$ .

Or

Find the area of the curve  $x = a \cos^3 t$ ,  $y = b \sin^3 t$ .

- 4. (A).** Find the asymptote to the curve  $y = 1 + e^x$ , parallel to x-axis.

**(B).** If A and B are Hermitian, show that AB is Hermitian if and only if  $AB = BA$ .