

## Mathematics

Internal Exam for Sem-I (Session 2019-22)

Core paper-I

F. M. 15

Answer any two ques.

- ① Find the reduction formula for  $\int \sin^n x dx$
- ② Find the volume & surface area of a sphere of radius  $a$ .
- ③ Find the area of the cardioid  
 $r = a(1 + \cos\theta)$
- ④ Find the Asymptote of the curve  
 $(x+y)^2 (x+y+z) = 2+9y-z$

## Mathematics

Internal Exam for Sem-I Session 2019-22

Core paper - II

F.M. - 15

Answer any three ques but Q.N. 01 is compulsory.

- Q1 (a) Define Relation.
  - (b) Define Equivalence Relation
  - (c) Define Rank of matrix
  - (d) Define elementary matrix.
  - (e) State De Moivre's theorem.
- Q2 State & prove well-ordering principle of number theory.
- Q3 If  $x + \frac{1}{x} = 2\cos\theta$ , show that  $x^n + \frac{1}{x^n} = 2\cos n\theta$ .
- Q4 Show that the relation of congruence modulo  $m$  on the set  $Z$  of integers is an equivalence relation.
- Q5 Show that the matrix

$$A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$$

satisfies its own characteristic equation.