

**Internal Assessment**

**Dept. Of Science**

**Subject – Mathematics**

**Semester - 2<sup>nd</sup> (DSC)**

**Full Marks- 15**

1) **Answer the following questions:**

**5 × 3 = 15**

- a) Find the roots of the equation  $x^5 = 1$  .
- b) If  $n$  be a positive integer prove that  $n^n > 1.3.5 \dots (2n - 1)$  .
- c) If  $\alpha, \beta, \gamma, \delta$  be the roots of the equation  $x^4 - x^3 + 2x^2 + x + 1 = 0$ , find the value of  $(\alpha + 1)(\beta + 1)(\gamma + 1) = 0$  .
- d) Prove that the roots of the equation  $\frac{1}{x-1} + \frac{1}{x-2} + \frac{1}{x-3} = x$  are all real.
- e) If  $+\frac{1}{x} = 2\cos\frac{\pi}{7}$ , then show that  $x^7 + \frac{1}{x^7} = -2$ .