B.Sc.DEGREE EXAMINATION,ODD SEMESTER 2020
II Year III Semester
Allied Mathematics-I

Max.marks :25

Answer any **FIVE** questions $(5 \times 5 = 25)$ Marks

1. Show that $\sum_{n=0}^{\infty} \frac{5n+1}{(2n+1)!} = \frac{e}{2} + \frac{2}{e}$.
2. Prove that the given matrix A $= \begin{pmatrix} \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{3}} & -\frac{2}{\sqrt{6}} & 0 \\ \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{6}} & \frac{1}{\sqrt{2}} \end{pmatrix}$ is orthogonal.
3. Prove that $\frac{\sin 7\theta}{\sin \theta} = 7 - 56 \sin^2\theta + 112\sin^4\theta - 64 \sin^6\theta$.
4. Using Newton's forward interpolation formula find the value of y at $x = 28$.

x	20	23	26	29
y	0.3420	0.3907	0.4384	0.4848

5. Separate into real and imaginary parts of sec$h(x - iy)$.
6. Find the eigen values and eigenvector of A $= \begin{pmatrix} 4 & 1 \\ 3 & 2 \end{pmatrix}$.
7. Find the sum to infinity the series $1 + \frac{1+5}{2!} + \frac{1+5+5^2}{3!} +$ .....