B.Sc DEGREE EXAMINATION, EVEN SEMESTER 2021
I Year I Semester
General Chemistry - II

Max.marks :25

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

1. Find the sum of the Binomial series $\frac{1.3}{2.4.6.8}+\frac{1.3.5}{2.4.6.8.10}+...\infty$.
2. Show that the matrix $\begin{pmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{pmatrix}$ satisfies its characteristic equation.
3. If $\frac{sinx}{x}=\frac{863}{864}$, estimate an approximate value of x.
4. The population of a town is shown in the following table:

Year:	1921	1931	1941	1951	1961
Population (in thousand):	19.96	39.65	58.81	77.21	94.61

   Use interpolation formula to estimate what could be the population in the year 1963.
5. Prove that $\frac{(1+tanhx)}{(1-tanhx)}$=cosh2x+sinh2x.
6. Determine the characteristic roots of the matrix $\begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & -1 \\ 2 & -1 & 0 \end{pmatrix}$
7. Test whether $\log\sqrt{12}$ can be expanded as the infinite series

   $1+(\frac{1}{2}+\frac{1}{3})+\frac{1}{4}+(\frac{1}{4}+\frac{1}{5})\ \frac{1}{4^2}+(\frac{1}{6}+\frac{1}{7})\ \frac{1}{4^3}\ +\infty$