SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - II
20UMACT2003 - Classical Algebra

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Find the sum of the infinite series $1 + \frac{3}{4} + \frac{3.5}{4.8} + \frac{3.5.7}{4.8.12}$+.....a
2. Frame the equation whose one root is $\sqrt{5}+\sqrt{2}$.
3. Diminish the root of the equation x^4-5x^3+7x^2-4x+5 by 2.
4. Find A^n in terms of A where A $= \begin{pmatrix} 4 & 2 \\ 3 & 3 \end{pmatrix}$
5. Show that 8^{th} power of any number is in the form 17m or 17m$\pm$1
6. Find the symmetric and skew symmetric matrix of A $= \begin{pmatrix} 2 & 1 & 4 \\ 8 & -1 & 3 \\ 3 & -5 & 0 \end{pmatrix}$
7. Solve the equation x^4-5x^3+4x^2+8x-8 = 0 whose one root is 1-$\sqrt{5}$.
8. Find the smallest number with 18 divisor

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. A)Sum the series $\sum \frac{(n+1)^3}{n!}$ x^n.

   B)Show that $\frac{5}{1.2.3} + \frac{7}{3.4.5} + \frac{9}{5.6.7}$+...=3 log 2-1.
10. Find the condition that the roots of the equation ax^3 +3bx^2+3cx+d = 0 may be geometric progression. Solve the equation 27x^3+42x^2-28x-8 = 0 whose roots are in geometric progression
11. Solve the equation 6x^5-x^4-43x^3+43x^2+x-6 = 0
12. Find the inverse of the matrix $\begin{pmatrix} 2 & 2 & 0 \\ 2 & 1 & 1 \\ -7 & 2 & -3 \end{pmatrix}$ using Cayley- Hamilton – Theorem.
13. If d1,d2,d3,. . . ..dn are divisors of N then show that ϕ(d1)+ϕ(d2) +. . . .ϕ(dn)=N.

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