

**APPLIED MATHEMATICS-1(BAS-101)**

**(INFINITE SERIES)**

**TUTORIAL SHEET -5**

**(Gauss's Test, Cauchy's Integral Test)**

**14. Test the convergence of the series.**

15. 1.  $1 + \frac{2x}{2} + \frac{3^2 x^2}{3!} + \frac{4^3 x^3}{4!} + \dots$ , for  $x > 0$

16. 2.  $\frac{x}{1} + \frac{1}{2} \frac{x^3}{3} + \frac{1.3}{2.4} \frac{x^5}{5} + \frac{1.3.5}{2.4.6} \frac{x^7}{7} + \dots$  for  $x > 0$

17. 3.  $\frac{a+x}{1!} + \frac{(a+2x)^2}{2!} + \frac{(a+3x)^3}{3!} + \dots$ , for  $a, x > 0$

18. 4.  $\frac{1^2}{2^2} + \frac{1^2.3^2}{2^2.4^2} + \frac{1^2.3^2.5^2}{2^2.4^2.6^2} + \dots$

**19. 5. Apply Cauchy's Integral Test to test the convergence of the series.**

20. (a)  $\sum_{n=1}^{\infty} \frac{1}{n^2+n}$

21. (b)  $\sum_{n=1}^{\infty} \frac{1}{n^2+1}$

22. 6 Test the convergence of  $\sum_{n=3}^{\infty} \frac{1}{n \log n (\log \log n)^p}$   $p > 0$

**23. Test for convergence the series whose nth term is**

24. 7.  $\frac{(n!)}{(2n)!} x^n$ ,  $x > 0$

25. 8.  $\frac{n!}{(n+1)^n} x^n$   $x > 0$