

Km Mayawati Govt.Girls Polytechnic,Badalpur

Assignment (Unit-1)

[Applied Mathematics-I(1 Sem)]

- 1- Find the sum of 10 terms of the series 4+8+12+.....
- 2- If the nth term of an AP is given by $2n-1$,find its 10th term .
- 3- Which term of the series 68+64+60+..... is -8 ?
- 4- If the pth term of an AP is q and qth term is p , find its (p+q) th term.
- 5- Prove the series $\frac{4}{\sqrt{2}}+3\sqrt{2}+\frac{8}{\sqrt{2}}+.....$ is in AP .Find the sum of its 50 terms.
- 6- If the sum of p , q, and r terms of an AP be a ,b ,and c respectively ,prove

$$\frac{a}{b}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$$

- 7- Find three numbers in AP .whose sum is 21 and product is 231.
- 8- Insert 4 AMs between -1 and 9 and find their sum .
- 9- If a^2 , b^2 , c^2 are in AP .then prove that $\frac{1}{b+c}$, $\frac{1}{c+a}$, $\frac{1}{a+b}$ will be in AP.
- 10- Find the 10th term of the series 3 , -6 ,12 , -24 ,
- 11- Which term of the sequence 1, $\sqrt{3}$,3,.....is 81 ?
- 12- If the pth , qth and rth terms of a GP are x, y, z respectively , then show that

$$x^{q-r}y^{r-p}z^{p-q} = 1$$

- 13- How many terms of the GP 1+4+16+64+.....will make 5461.
- 14- Find sum of n terms of 6+66+666+.....
- 15- Find the sum of the infinite series $1+\frac{1}{3}+\frac{1}{9}+\frac{1}{27}+.....\infty$
- 16- Insert 4 GMs between 160 and 5 .
- 17- If a , b , c are in GP prove $\log a$, $\log b$, $\log c$ will be in AP.
- 18- Find three numbers in GP . whose sum is 42 and product is 512 .
- 19- If 2 , a ,8 are in AP and 5 , b , 20 are in GP then find a+b .

20- (a) Expand $(2x^2 - \frac{3}{x})^6$

(b) Find $(1000)^3$ using binomial theorem

(c) Find the 6th term in the expansion of $(\frac{4x}{5} - \frac{5}{4x})^{10}$

(d) Find the middle term of the expansion of $(\frac{4x}{5a} + \frac{5a}{4x})^{10}$

(e) Find the term free of x in the expansion of $(3x - \frac{2}{x^2})^{15}$

(f) find the coefficient of x^5 in the expansion of $(\frac{4x}{5} + \frac{5}{2x})^{17}$

21- Evaluate 10_{C_r} if $10_{C_r} = 10_{C_{r+2}}$.

22-Find the greatest term of the expansion $(4 - 3x)^8$, when $x = 4$.

23-Prove the following –

(i) $c_1 + 2 c_2 + 3 c_3 + \dots + n c_n = n 2^{n-1}$

(ii) $c_0 + 1/3 c_2 + 1/5 c_4 + \dots = \frac{2^n}{n+1}$

(iii) $c_1/c_0 + 2 c_2/c_1 + 3 c_3/c_2 + \dots + n c_n/c_{n-2} = \frac{n(n+1)}{2}$

(iv) $C_0^2 + C_1^2 + C_2^2 + \dots + C_n^2 = \frac{(2n)!}{(n!)^2}$

(v) $C_0 + 2 C_1 + 3 C_2 + \dots + (n+1) C_n = 2^{n-1}(2+n)$

24-(i) Expand $(3 + 2x)^{3/2}$ upto 4 terms .

(ii) Find the coefficient of x^5 in the expansion $(4 - 3x)^{-1/2}$

(iii) Find the general term in the expansion $(1 - x^2)^{-3}$

(iv) Find the fifth term in the expansion $(1 - 2x^3)^{11/2}$

(v) Evaluate $\sqrt{30}$ upto 4 decimal places

25-Find the sum of the series $1 + 2 \times \frac{1}{3} + 3 \times \frac{1}{3^2} + 4 \times \frac{1}{3^3} + \dots \infty$