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	eriginary materials and a second seco	Dec-2023		A CONTRACTOR OF THE PROPERTY O
		B.Sc. (Chemistry) 3rd Sem.		
and the first section of the section	S	tatistics and Infinite Series (OMTH-302)		
Time: 3 Hours				Max. Marks:75
Instructions:	2 Answer any	sory to answer all the questions (1.5 marks each) of Po four questions from Part -B in detail. b-parts of a question are to be attempted adjacent to		rt.

## PART-A

Que.1(a)Find tenth term of the A.P. whose first term is 5 and common difference is 2.

- (b) Is 90 a term of the series  $4 + 7 + 10 + 13 + \dots$ ?
- (c)Explain bounded sequence with examples.
- (d)Define independent events. Also give two examples.
- (e) If the fifth term of a G.P. is 162 and the first term is 2, then find the common ratio.
- (t) A bag contains 6 white balls, 9 black balls. What is the probability of drawing a black ball?
- (g) What is the probability of getting a total of more than 10 in a single throw with two dice?
- (h) What is positive term series? Explain.
- (i) Examine the nature of the series  $1+2+3+4+\ldots+n+\ldots$ .
- (j) Test the nature of the series  $1 + (3/4) + (9/16) + (27/64) + \dots \infty$ . (1.5\*10 = 15)

## PART-B

Q.2(a)Calculate the arithmetic mean of the number of florets on sunflower as given below:

Class interval	Frequency	Class Interval	Frequency
10-20	A. Em 2 and slong E bo	50-60	29 bas avod & ses endT(d)
20-30	bed and order laig set tent	60-70	the two cours laughed 101 1/1/1/1/
30-40	17	70-80	3
40-50	29	80-90	2
		90-100	1 (7)

(b)In a study on patients, the following data was obtained. Find the standard deviation of the data.

Age(in	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
years):			3rd Sem.	Printing	1.08.8			
Number of	1	0	140) 89	10	17	38	9	3
Cases:							1871	o i 6 mili
Cases:	Library	<del>dracii</del>	in the Color	Toncemp and the	1 10 81 211 21 03	PEDELUGINOS		(8)

Q.3(a) The sum of 'p' terms of a series is  $2p^2+p$ . Prove that the series is in A.P. (7)

(b) The sum of the digits of a three digited number is 12. The digits are in A.P. If the digits are reversed, then the number is diminished by 396. Find the number. (8)

Q.4(a)If 3x+1.7x and 10x+8 be in G.P., then find the value of x. (7)

(b) Find the sum of the given series:

(i)2+6+18+54+....to 10 terms.

(ii) 
$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} \dots \dots \dots$$
 to 12 terms. (8)

Q.5(a)The probability that a student passes a physics test is(2/3) and the probability that he passes both physics and English test is (14/45). The probability that he passes at least one test is (4/5). What is the probability that the student passes the English test. (7)

(b) The probability that a boy will get a scholarship is 0.9 and that a girl will get is 0.8. What is the probability that at least one of them will get the scholarship? (8)

Q.6(a)Prove that the given series  $\frac{2}{3!} + \frac{3}{4!} + \frac{4}{5!} + \cdots$  is convergent and find its sum. (7)

(b) Examine the convergence of the series: 
$$\frac{\sqrt{2}-1}{3^3-1} + \frac{\sqrt{3}-1}{4^3-1} + \frac{\sqrt{4}-1}{5^3-1} + \cdots$$
 (8)

Q.7(a)If a,b,c, are in A.P., then prove that  $a^2(b+c)$ ,  $b^2(c+a)$ ,  $c^2(a+b)$  are in A.P. (7)

(b) There are 4 boys and 2 girls in room A and 5 boys and 3 girls in room B. A girl from one of the two rooms laughed loudly. What is the probability that the girl who laughed was from room B.