INDIAN SCHOOL AL WADI AL KABIR

Class XI (2026-27)

Mathematics Worksheet- SEQUENCE AND SERIES

Q.1.	$3^1.3^{\frac{1}{2}}.3^{\frac{1}{4}}.3^{\frac{1}{8}}\ldots\ldots.\infty =$							
	A	9	B	27	C	∞	D	729
Q.2	If product of three consecutive terms of a GP is $-\frac{64}{27}$, then the second term is :							
	A	$\frac{4}{3}$	B	$-\frac{8}{9}$	C	$-\frac{4}{3}$	D	$\pm\frac{4}{3}$
Q.3	The sum of three numbers in a geometric progression is 38, and their product is 1728. What is the greatest number in this progression?							
	A.	24	B.	18	C.	32	D.	16
Q.4	For two distinct positive numbers a and b let A be their arithmetic mean and G be their geometric mean. Which of the following statements is always true regarding A and G?							
	A.	$A > G$	B.	$G < A$	C.	$A \geq G$	D.	$G \geq A$
Q.5	If a, b and c are non-zero real numbers that belong to both an Arithmetic Progression and a Geometric Progression simultaneously, then which condition must hold true?							
	A.	a = b = -c	B.	a = b = c	C.	2b = a+c	D.	$b^2 = ac$
Q6.	If a, b and c are in G.P. then $\frac{1}{a+b}, \frac{1}{2b}, \frac{1}{b+c}$ forms a/an							
	A	A.P	B	G.P	C	H.P	D	neither
Q7.	If p, q and r are positive real numbers such that p + q = 12), what is the maximum possible value of their geometric mean $\sqrt{pq}$ and at what values of p and q does this maximum occur?							
	A	Max. value=12 when p=6, q=6	B	Max. value=36 when p=6, q=6	C	Max. value=6 when p=6, q=6	D	Max. value= when p=4, q=8

Q8.	For any positive real number x, what is the minimum value of the expression $x + \frac{16}{x}$?							
	A	32	B	16	C	8	D	4
Q9.	What is the minimum value of the function $f(x) = 3^x + 3^{-x}$ for any real number x?							
	A	1	B	2	C	6	D	0
Q10.	If the ratio of the sum of the first 6 terms of a GP to the sum of the first 3 terms of the GP is 9, what is the common ratio of the Geometric Progression?							
	A	2	B	3	C	-2	D	1/3

Assertion and Reason

A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion.

B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion.

C) Assertion (A) is true, but Reason (R) is false.

D) Assertion (A) is false, but Reason (R) is true.

Q11. **Assertion (A):** Sum of 7 terms of the GP 3, 6, 12, ... is 381.

Reason (R): Sum of first n terms of the G. P is given by $S_n = \frac{a(r^n - 1)}{r - 1}$, where a = first term, r = common ratio and |r| > 1.

Q12. Assertion: The first four terms of the sequence $a_n = 3 \cdot 2^{n-1}$ are $3, 6, 12, 24$, and they form a G.P.

Reason: The ratio of every term to its immediately preceding term is 2.

Q13. Assertion: If $a_1 = 1$ and $a_n = a_{n-1} + 2$ for $n \geq 2$, then the sum of the first five terms is 25.

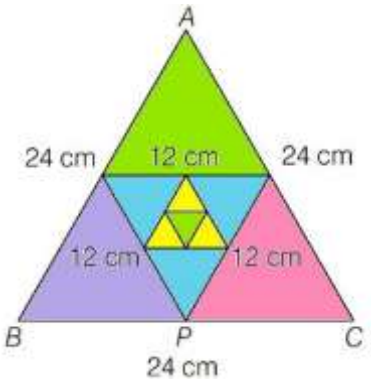
Reason: The sequence is a G.P. with common ratio 2.

Q14. **Assertion (A):** The 5^{th} term from the end of the Geometric Progression $2, 6, 18, \ldots, 1458$ is 18.

Reason (R): The n^{th} term from the end of a G.P. with last term l and common ratio r is given by $a'_n = \frac{l}{r^{n-1}}$.

Q15.	**Assertion (A):** If the sum of the first n terms of a sequence is $S_n = 3(2^n - 1)$, then the common ratio of this sequence is 2. **Reason (R):** The n^{th} term a_n of any sequence can be determined using $a_n = S_n - S_{n-1}$ for $n \geq 2$.
	Section B- Short answer type (2 marks)
Q16.	A hot tub in a hotel suite is not hot enough. The hotel tells you that they will increase the temperature by 5% each hour. If the current temperature of the hot tub is 60^0F what will be the temperature of the hot tub after 10 hours? Give your answer correct to 3 significant figures
Q17.	A culture of bacteria doubles every 3 hours. If there are 100 bacteria at the beginning, how many bacteria will there be after 24 hours?
Q18.	A mine worker discovers an ore sample containing 600mg of radioactive material. It is discovered that the radioactive material has a half-life of 1 day. Find the amount of radioactive material in the sample at the end of the 8th day.
Q19.	Amongst of all pairs of positive integers, with product is 289, find which of the two numbers add up to the least.
Q20	A fisherman caught 350kg of fishes on Monday. From Monday to Friday, the amount of fishes he caught increased by 10% per day. What is the total amount of fishes did the fisherman catch in the first five days? Give your answer as an integer.
	SHORT ANSWER TYPE QUESTIONS(3m)
Q21	A city has a population of 30,000 people in the year 2015. If the population increases 15% per year, what will the population be in 2026?
Q22	Suppose you deposit ₹ 1 into your piggy bank on the first day of December and, on each day of December after that, you deposit twice as much as on the previous day. How much will you have in the bank after the last deposit?
Q23.	At the age of 16, Tara began receiving yearly payments from a trust fund. On each succeeding birthday, she received twice as much as in the preceding year. If she had received a total of ₹148,617 by age 21, how much did she receive at age 16?
Q24.	How many terms of the following G. P.: 64, 32, 16, … has the sum $127\frac{1}{2}$.
Q25.	Find the value of 'a' given that the geometric mean between x and y $\frac{x^{a+2}+y^{a+2}}{x^{a+1}+y^{a+1}}$

Case Study Based Questions	
Q26.	Amanda decides that starting in January she will deposit £100 into her bank account at the start of each month. Her account earns 0.25% interest per month. Interest is calculated at the end of each month. (a) In the middle of February, how much money is in Amanda's account? (b) In the middle of March, how much money is in Amanda's account? (c) In the middle of the nth month (where January is the 1st month, February is the 2nd month, etc.), how much money is in Amanda's account? Give your answer in closed form. (d) In the middle of December, how much money is in Amanda's account?
Q27.	A sequence of non-zero numbers is said to be a geometric progression, if the ratio of each term, except the first one, by its preceding term is always constant. Rahul, being a plant lover, decides to open a nursery and he bought few plants and pots. He wants to place pots in such a way that the number of pots in the first row is 2, in second row is 4 and in the third row is 8 and so on…..  (a) Find the constant multiple by which the number of pots is increasing in every row (1) (b) Find the number of pots in 8th row. (1) (c) Find the difference in number of pots placed in 7th row and 5th row (2) OR (e) If Rahul wants to place 510 pots in total, then find the total number of rows formed in this arrangement

Q28.	In Rangoli competition in school, Preeti made Rangoli in the equilateral shape. Each side of an equilateral triangle is 24 cm. The mid-point of its sides are joined to form another triangle. This process is going continuously infinite.  Based on above information, answer the following questions. (a) Find the side of the 5th triangle (in cm) (1) (b) Find the sum of perimeter of first 6 triangle (in cm) (2) **OR** (c) Find the area of all the triangle (in sq cm). (2) (d) Find the sum of perimeter of all triangle (in cm). (1)

ANSWER KEY

Q1.	A	Q2	C	Q3	B	Q4	A
Q5.	B	Q6	A	Q7	C	Q8	D
Q9.	D	Q10	A	Q11	A	Q12	A
Q13.	C	Q14	A	Q15	A	Q16	T≈977^{o}F
Q17.	**25,600** bacteria.	Q18.	2.34375mg	Q19	The two numbers are **17 and 17** (with a minimum sum of **34**)	Q20	2136.785 kg
Q21	P ≈139,572	Q22	₹2,147,483,647	Q23	₹ 2,359	Q24	8 terms
Q25	$-\frac{3}{2}$ or -1.5	Q26	(a) £200.25 (b) £300.750625 (c) $\boxed{40000\left[(1.0025)^{n}-1\right]}$ (d) £1,216.64	Q27	(a) 2 (b) 256 (c) 96 (d) 8	Q28	(a) 1.5cm (b) 141.75cm (c) $192\sqrt{3}$ (d) 144

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