	BCM SCHOOL BASANT AVENUE DUGRI ROAD LDH **CLASS XISC (SEQUENCES AND SERIES)** **ANSWER KEY**
1	(A)4
2	(A)0
3	(C) A is true but R is false.
4	It is given that a, b, c, d are in G.P. Therefore, $b^2 = ac$ ....(1) $c^2 = bd$ ....(2) $ad = bc$ ....(3) We need to prove $(a^n + b^n), (b^n + c^n), (c^n + d^n)$ are in G.P. i.e., we have to prove that $(b^n + c^n)^2 = (a^n + b^n)\times(c^n + d^n)$ Consider, $(b^n + c^n)^2 = b^{2n} + 2b^nc^n + c^{2n}$ $= (b^2)^n + 2b^nc^n + (c^2)^n$ $= (ac)^n + 2b^nc^n + (bd)^n$ [Using (1) and (2)] $= a^nc^n + b^nc^n + b^nc^n + b^nd^n$ $= a^nc^n + b^nc^n + a^nd^n + b^nd^n$ [Using (3)] $= c^n (a^n + b^n) + d^n (a^n + b^n)$ $= (a^n + b^n)(c^n + d^n)$ Hence, $(b^n + c^n)^2 = (a^n + b^n)\times(c^n + d^n)$ Thus, $(a^n + b^n), (b^n + c^n), (c^n + d^n)$ are in G.P

5	**Positive number a, b** $A.M = \frac{a+b}{2}$ $GM = \sqrt{ab}$ $m : n = \frac{a+b}{2\sqrt{ab}}$ $R.H.S = \frac{(m+\sqrt{m^2-n^2})}{(m-\sqrt{m^2-n^2})}$ **Divide by n in both numerator and denominator.** $= \frac{\left(\frac{m}{n}+\sqrt{\frac{m^2}{n^2}-1}\right)}{\left(\frac{m}{n}-\sqrt{\frac{m^2}{n^2}-1}\right)}$ $= \frac{\left(\frac{a+b}{2\sqrt{ab}}+\sqrt{\frac{a^2+b^2+2ab}{4ab}-1}\right)}{\left(\frac{a+b}{2\sqrt{ab}}-\sqrt{\frac{a^2+b^2+2ab}{4ab}-1}\right)}$ $= \frac{\left(\frac{a+b}{2\sqrt{ab}}+\sqrt{\frac{a^2+b^2-2ab}{4ab}}\right)}{\left(\frac{a+b}{2\sqrt{ab}}-\sqrt{\frac{a^2+b^2-2ab}{4ab}}\right)}$ $= \frac{a+b+(a-b)}{2\sqrt{ab}}$ $\frac{2a}{2b} = \frac{a}{b} = LHS$ $LHS = RHS$
6	a +b = 3, ab = p, c + d =12 and cd = q a, b, c and d form a G.P. $\therefore$ First term = a, b = ar, c = ar^2 and d = ar^3 Then, we have a + b = 3 and c + d = 12 $\Rightarrow a + ar = 3$ $\Rightarrow a(1+r) = 3...(i)$ Similarly, $ar^2(1+r) = 12...(ii)$ $\Rightarrow \frac{ar^2(1+r)}{a(1+r)} = \frac{12}{3}$ $\Rightarrow r^2 = 4$ $\Rightarrow r = 2$ $\therefore a(1+r) = 3$ $\Rightarrow a = 1$ Now , $p = ab$ $\Rightarrow p = a \times ar = 2$ And, $q = cd$ $\Rightarrow q = ar^2 \times ar^3 = 2^5 = 32$ $\therefore \frac{q+p}{q-p} = \frac{32+2}{32-2} = \frac{34}{30} = \frac{17}{15}$
7	(i)Rs. 1800 (ii)Rs.2800

	(iii) Rs. 22000+17100=**39100**.