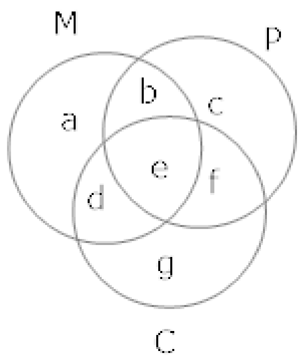
	BCM SCHOOL BASANT AVENUE DUGRI ROAD LUDHIANA ASSIGNMENT OF BINOMIAL THEOREM XI SC ANSWER KEY (MATHS)	

	ANSWER KEY CLASS XI SC
1	c
2	b
3	c
4	Given that, $a_1, a_2, \ldots, a_n$ are in A.P., $\forall\, a_i > 0$ $\therefore \quad a_1 - a_2 = a_2 - a_3 = \ldots = a_{n-1} - a_n = -d$ (constant) (1 Now, $\frac{1}{\sqrt{a_1}+\sqrt{a_2}} + \frac{1}{\sqrt{a_2}+\sqrt{a_3}} + \cdots + \frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}}$ $= \frac{\sqrt{a_1}-\sqrt{a_2}}{a_1-a_2} + \frac{\sqrt{a_2}-\sqrt{a_3}}{a_2-a_3} + \cdots + \frac{\sqrt{a_{n-1}}-\sqrt{a_n}}{a_{n-1}-a_n}$ (rationalizing) $= \frac{\sqrt{a_1}-\sqrt{a_2}}{-d} + \frac{\sqrt{a_2}-\sqrt{a_3}}{-d} + \cdots + \frac{\sqrt{a_{n-1}}-\sqrt{a_n}}{-d}$ $= \frac{1}{-d}[\sqrt{a_1}-\sqrt{a_n}]$ $= \frac{a_1-a_n}{-d(\sqrt{a_1}+\sqrt{a_n})}$ (rationalizing) $= \frac{-(n-1)d}{-d(\sqrt{a_1}+\sqrt{a_n})}$ (as $a_n = a_1 + (n-1)d$) $= \frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$
5	It has to be proved that the sequence: aA, arAR, ar^2AR^2 , ...$ar^{n-1}AR^{n-1}$, forms a $\frac{\text{Second term}}{\text{First term}} = \frac{arAR}{aA} = rR$ $\frac{\text{Third term}}{\text{Second term}} = \frac{ar^2AR^2}{arAR} = rR$ Thus, the above sequence forms a G.P. and the common ratio is rR.
6	**The coeff. Of the first three terms of** $\left(x-\frac{3}{x^2}\right)^m$ **are** ${}^mC_0, (-3)\,{}^mC_1$ **and**

	$9\ {}^{m}C_{2}$. **Therefore, by the given condition** $^{m}C_{0}-3\,{}^{m}C_{1}+9\,{}^{m}C_{2}=559$ $1-3m+\frac{9m(m-1)}{2}=559$ **On solving we get** $m=12$ $T_{r+1}={}^{12}C_{r}(x)^{12-r}\left(\frac{-3}{x^{2}}\right)^{r}$ $={}^{12}C_{r}(x)^{12-r}.(-3)^{r}.(x)^{-2r}$ $={}^{12}C_{r}(x)^{12-3r}.(-3)^{r}$ $12-3r=3 \Rightarrow r=3,\ req.$ term is $-5940\,x^{3}$
7	**a = 3, b = 2, n=3**
8	
9	**(i)n (H ∪ S) = n (H) + n (S) – n (H ∩ S)** **= 30 + 25 – 16** **= 39** **(ii)n (** $H' \cap S'$ **) = n (H ∪ S** $)'$ **= n(∪) - n (H ∪ S)** **= 50 – 39=11** (iii) **n (H ∪ S) = n (H) + n (S) –2 n (H ∩ S)** **= 30 + 25 – 2×16** **= 23**
10	n(M)=a+b+d+e=15  $n(P)$ = b + c + e + f = 12 n(C) = d + e+f + g = 11 n (M ∩P) = b + e = 9 n (M ∩C) = d + e = 5 n (P ∩ C) = e +f = 4

	$e = 3$ so $b = 6$, $d = 2$, $f = 1$ $a = 4$, $g = 5$, $c = 2$ (i) $g = 5$, (ii) $a = 4$, (iii) $c = 2$ (iv) $f = 1$, (v) $b = 6$, (vi) $g + a + c = 11$ (vii) $a + b + c + d + e + f + g + = 23$ (viii) $25 - (a + b + c + d + e + f + g) = 25 - 23 = 2$