X H.W–11 (MCQs)

1) The next term of the AP : $\sqrt{18}, \sqrt{50}, \sqrt{98}, \ldots$ is
(a) $\sqrt{146}$ (b) $\sqrt{128}$ (c) $\sqrt{162}$ (d) $\sqrt{200}$

2) The 12^{th} term of an AP whose first two terms are -3 and 4
(a) 67 (b) 74 (c) 60 (d) 81

3) The 7^{th} term from the end of the AP 7, 11, 15, ... 107 is
(a) 79 (b) 83 (c) 81 (d) 87

4) If the common difference of an AP is 7, then $a_{25} - a_{21}$ is equal to (a) 14 (b) 20 (c) 28 (d) 35

5) If $a_{20} - a_{12} = -32$, then the common difference of the AP is
(a) 4 (b) -4 (c) -3 (d) 3

6) If the n^{th} term of an AP is $7n+12$, then its common difference is (a) 12 (b) 5 (c) 7 (d) 19

7) If the sum of n terms of an AP is $S_n = 3n^2 + 4n$, then common difference of the AP is (a) 7 (b) 5 (c) 8 (d) 6

8) The sum of first n odd natural numbers is
(a) $2n$ (b) $2n+1$ (c) n^2 (d) n^2-1

9) The sum of first n even natural numbers is
(a) $2n$ (b) n^2 (c) n^2+n (d) n^2-1

10) If n^{th} term of an AP is $2n+1$, then the sum of first n terms of the AP is
(a) $n(n-2)$ (b) $n(n+2)$ (c) $n(n+1)$ (d) $n(n-1)$

11) If the ratio of 18^{th} term to 11^{th} term of an AP is 3:2, then the ratio of the 21^{st} term to 5^{th} term is
(a) 3:2 (b) 3:1 (c) 1:3 (d) 2:3

12) If the sum of n terms of two A.Ps are in the ratio $(2n+3):(3n+2)$, then the ratio of their m^{th} term is
(a) $(4m-1):(6m+1)$ (b) $(6m+1):(4m+1)$
(c) $(4m+1):(6m-1)$ (d) $(4m+1):(m+6)$

13) The sum of n terms of two APs are in the ratio $5n+9 : 9n+6$, then the ratio of their 18^{th} term is
(a) $\frac{184}{321}$ (b) $\frac{178}{321}$ (c) $\frac{175}{321}$ (d) $\frac{176}{321}$

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14) Two A.P's have the same common difference. The first term of one of these is 8 and that of the other is 3. The difference between their 30^{th} terms is
(a) 11 (b) 3 (c) 8 (d) 5

15) The sum of first 24 terms of the sequence whose n^{th} term is given by $a_n = 3 + \frac{2}{3}n$

(a) 270 (b) 272 (c) 382 (d) 384

16) If the n^{th} term of an AP is $2n+1$, then sum of first n terms of the AP is
(a) $n(n-2)$ (b) $n(n+2)$ (c) $n(n+1)$ (d) $n(n-1)$

17) The sum of n terms of an A.P is $3n^2+5n$, then 164 is its
(a) 24^{th} term (b) 27^{th} term (c) 26^{th} term (d) 25^{th} term.

18) The no. of terms of the AP 3, 7, 11, 15, ... to be taken so that the sum is 406 is
(a) 5 (b) 10 (c) 12 (d) 14

19) If the first term of an AP is 2 and common difference is 4, then the sum of its 40 terms is
(a) 3200 (b) 1600 (c) 200 (d) 2800

20) The common difference of the AP $\frac{1}{2b}, \frac{1-6b}{2b}, \frac{1-12b}{2b}, \ldots$ is

(a) $2b$ (b) $-2b$ (c) 3 (d) -3

21) If k, $2k-1$ and $2k+1$ are three consecutive terms of an AP, the value of k is (a) -2 (b) 3 (c) -3 (d) 6

22) If $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ are in A.P, then $x =$

(a) 5 (b) 3 (c) 1 (d) 2

23) The n^{th} term of an AP, then sum of whose n terms is S_n is (a) $S_n + S_{n-1}$ (b) $S_n - S_{n-1}$ (c) $S_n + S_{n+1}$ (d) $S_n - S_{n+1}$

24) The common difference of an AP, the sum of whose n terms is S_n
(a) $S_n - 2S_{n-1} + S_{n-2}$ (b) $S_n - 2S_{n-1} - S_{n-2}$ (c) $S_n - S_{n-2}$ (d) $S_n - S_{n-1}$

25) If 18, a, b, -3 are in AP, then $a+b =$ ___
(a) 19 (b) 7 (c) 11 (d) 15

X H.W-11 (Answers)

1) $3\sqrt{2}, 5\sqrt{2}, 7\sqrt{2}, 9\sqrt{2}$

$9\sqrt{2} = \sqrt{81\times 2} = \sqrt{162}$ (c)

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline & 3 \end{array} \quad \begin{array}{r|l} 5 & 50 \\ \hline 5 & 10 \\ \hline & 2 \end{array} \quad \begin{array}{r|l} 7 & 98 \\ \hline 7 & 14 \\ \hline & 2 \end{array}$$

2) $a_1 = -3$

$a_2 = 4$

$d = a_2 - a_1 = 4+3 = 7$

$a_{12} = a + 11d = -3 + 11\times 7 = -3+77 = 74$ (b)

3) $l-(n-1)d = 107 - 6\times 4 = 107-24 = 83$ (b)

4) $a_{25} - a_{21} = \cancel{a} + 24d - \cancel{a} - 20d = 24d - 20d = 4d = 4\times 7 = 28$ (c)

5) $\cancel{a} + 19d - \cancel{a} - 11d = -32$

$8d = -32$

$d = -4$ (b)

6) $a_1 = 7+12 = 19$

$a_2 = 14+12 = 26$

$\therefore d = a_2 - a_1 = 26-19 = 7$ (c)

7) $S_1 = a_1 = 3+4 = 7$

$S_2 = a_1 + a_2 = 3\times 4 + 8 = 12+8 = 20$

$a_2 = S_2 - S_1 = 20-7 = 13$

$d = a_2 - a_1 = 13-7 = 6$ (d)

8) $1, 3, 5, 7, \ldots$

$S_n = \frac{n}{2}[2+(n-1)2] = \frac{n}{2}[\cancel{2}+2n-\cancel{2}] = \frac{n}{2}\times 2n = n^2$ (c)

9) $2, 4, 6, 8, \ldots$

$S_n = \frac{n}{2}[4+(n-1)2] = \frac{n}{2}[4+2n-2] = \frac{n}{2}(2+2n)$

$= \frac{n}{\cancel{2}_1}\times \cancel{2}^1(n+1) = n(n+1) = n^2+n$ (c)

10) $a_n = 2n+1$

$a_1 = 2+1 = 3$

$a_2 = 4+1 = 5$

$d = a_2 - a_1 = 5-3 = 2$

$S_n = \frac{n}{2}[2a+(n-1)d] = \frac{n}{2}[6+(n-1)2]$

$= \frac{n}{2}[6+2n-2] = \frac{n}{2}(4+2n)$

$= \frac{n}{\cancel{2}_1}\times \cancel{2}^1(2+n) = n(n+2)$ (b)

11) $3(k+1)-2(2k-1)+7=0$

$\Rightarrow 3k+3-4k+2+7=0$

$\Rightarrow -k+12=0$

$\Rightarrow -k=-12$

$k=12$ (d)

12) $y=\frac{3x}{2}$

$2x+5y=19$

$\Rightarrow 2x+5\times\frac{3x}{2}=19$

$\Rightarrow 2x+\frac{15x}{2}=19$

$\Rightarrow \frac{4x+15x}{2}=19$

$\Rightarrow \frac{\cancel{19}^{1}x}{2}=\cancel{19}^{1}$

$x=2$ //

$y=\frac{3}{\cancel{2}_{1}}\times\cancel{2}^{1}$

$y=3$ //

$\therefore$ The point is $(2,3)$ (a)

13) $1x+0y=7$ (b)

14) $x^2-1=(x+1)(x-1)$

Let $p(x)=ax^4+bx^3+cx^2+dx+e$

Since $(x+1)$ is a factor of $p(x)$,

$p(-1)=0$

$\Rightarrow a-b+c-d+e=0$

$\Rightarrow a+c+e=b+d$ (a)

15) Let $p(x)=px^2+5x+r$

Since $(x-2)$ is a factor of $p(x)$,

$p(2)=0$

$\Rightarrow 4p+10+r=0$

$\Rightarrow 4p+r=-10 \rightarrow (1)$

Since $(x-\frac{1}{2})$ is a factor of $p(x)$,

$p(\frac{1}{2})=0$

$\Rightarrow \frac{p}{4}+\frac{5^{\times 2}}{2\times 2}+\frac{r^{\times 4}}{1\times 4}=0$

$\Rightarrow \frac{p+10+4r}{4}=0$

$\Rightarrow p+10+4r=0$

$\Rightarrow p+4r=-10 \rightarrow (2)$

From eq:s (1) and (2),

$4p+r=p+4r$

$\Rightarrow 4p-p=4r-r$

$\Rightarrow \cancel{3}^{1}p=\cancel{3}^{1}r$

$p=r$ (a)

16) $2x+1$ (b)

17) Let $p(x) = x^3 + 10x^2 + mx + n$

Since $(x+2)$ is a factor of $p(x)$, $p(-2)=0$

$\Rightarrow -8 + 4\times 10 - 2m + n = 0$

$\Rightarrow -8 + 40 - 2m + n = 0$

$\Rightarrow 32 - 2m + n = 0$

$n = 2m - 32 \rightarrow (1)$

Since $(x-1)$ is a factor of $p(x)$, $p(1) = 0$

$\Rightarrow 1 + 10 + m + n = 0$

$\Rightarrow 11 + m + 2m - 32 = 0$

$\Rightarrow 3m - 21 = 0$

$3m = 21$

$m = 7$

$n = 14 - 32$

$n = -18$ (c)

18) Let $p(x) = 4x^3 + 3x^2 - 4x + k$

$p(1) = 0$

$\Rightarrow \cancel{4} + 3 - \cancel{4} + k = 0$

$\Rightarrow \quad k = -3$ (d)

19) If $a+b+c=0$, then $a^3+b^3+c^3 = 3abc$

$$\frac{a^{2\times a}}{bc\times a} + \frac{b^{2\times b}}{ca\times b} + \frac{c^{2\times c}}{ab\times c} = \frac{a^3+b^3+c^3}{abc} = \frac{3abc}{abc} = 3 \text{ (d)}$$

20) If $x+y+z=0$, then $x^3+y^3+z^3 = 3xyz$

Checking:- $\cancel{a^2} - \cancel{b^2} + \cancel{b^2} - \cancel{c^2} + \cancel{c^2} - \cancel{a^2} = 0$

$\cancel{a} - \cancel{b} + \cancel{b} - \cancel{c} + \cancel{c} - \cancel{a} = 0$

$$\therefore \frac{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3}{(a-b)^3 + (b-c)^3 + (c-a)^3} = \frac{3(a^2-b^2)(b^2-c^2)(c^2-a^2)}{3(a-b)(b-c)(c-a)}$$

$$= \frac{\cancel{3}(a+b)\cancel{(a-b)}(b+c)\cancel{(b-c)}(c+a)\cancel{(c-a)}}{\cancel{3}\cancel{(a-b)}\cancel{(b-c)}\cancel{(c-a)}}$$

$$= (a+b)(b+c)(c+a) \text{ (d)}$$