SECTION A

[for correct attempt +1 each , for wrong attempt -1/4 for each]

1)$The\ number\ of\ real\ roots\ of\ the\ equation\ x^2 - 3|x| + 2 = 0$ is

$a)2 \qquad b)1 \qquad c)4 \qquad d)3$

2) $If\ log_{2}\ (5 \times 2^{x} + 1)\ , log_{4}\ (2^{1-x} + 1)\ and\ 1\ are\ in\ A.P.\ , then\ x\ equals$

$a)log_2 5 \qquad b)1 - log_5 2 \qquad c)log_5 2 \qquad d)\ none\ of\ these$

3) $If\ x = 1 + i\ \ is\ a\ root\ of\ the\ equation\ x^3 - ix + 1 - i = 0\ then\ the\ other$ real root is

a)0 , b)1 ,c) -1 ,d) none of these

4) $The\ largest\ term\ common\ to\ the\ sequences\ 1,11,21,31, \ldots .to\ 100\ terms\ and\ 31,36,41,46, \ldots .to\ 100\ terms\ is$

$a)381 \quad ,b)471 \quad ,c)281 \quad ,d)none\ of\ these$

5)$If\ the\ x^2 + 2(a + b + c)x + 3(bc + ab + ca)\ is\ a\ perfect\ square\ , then$

$a)a = b = c \quad ,b)a = \pm b = \pm c \quad ,c)a = b \neq c \quad ,d)none\ of\ these$

6)$If\ a, b\ and\ c\ are\ in\ A.P.\ then\ a^3 + c^3 - 8b^3\ is\ equal\ to$

$a)2abc \quad ,b)6abc \quad ,c)4abc \quad ,d)none\ of\ these$

7)$Sum\ of\ the\ non\ real\ root\ of (x^2 + x - 2)(x^2 + x - 3) = 12\ \ is$

$a) - 1 \quad ,b)1 \quad ,c) - 6 \quad ,d)6$

8)$Consider\ an\ A.P.\ \ a1, a2, a3, \ldots \ldots \ldots .such\ that\ a3 + a5 + a8 = 11\ and\ a4 + a2 = -2\ \ , then\ the\ value\ of\ a1 + a6 + a7\ is$

$a) -8 \quad , b)5 \quad , c)7 \quad , d)9$

9)*The number of irratonal roots of the equation* $\frac{4x}{(x^2+x+3)} + \frac{5x}{(x^2-5x+3)} = -\frac{3}{2}$ is

$a)4$,b)0 ,c)1 ,d)2

10)*Suppose that* $F(n+1) = \frac{2F(n)+1}{2}$ *for* $n = 1,2,3, \ldots \ldots$ *and* $F(1) = 2$,
Then , $F(101)$ *equals*

a)50 ,b)52 ,c)54 , d)none of these

$$11) If\ tan^2\frac{\pi - A}{4} + tan^2\frac{\pi - B}{4} + tan^2\frac{\pi - C}{4} = 1, then\ \Delta ABC\ is$$

a)equilateral , b) isosceles ,c)scalene ,d)none of these

12) *A quadratic equation whose product of roots* $x1$ *and* $x2$ *is equal to* 4 *and satisfying the relation* $\frac{x1}{x1-1} + \frac{x2}{x2-1} = 2$ *is*

$$a)x^2 - 2x + 4 = 0 \quad , \quad b)x^2 + 2x + 4 = 0$$
$$C)x^2 + 4x + 4 = 0 \quad , \quad d)x^2 - 4x + 4 = 0$$

13)*Three numbers form an increasing* $G.P.$ *If the middle number is doubled , then the new numbers are in* $A.P.$ *The common ratio of the* $G.P.$ *is*

$a)2 - \sqrt{3}$, $b)2 + \sqrt{3}$, $c)\sqrt{3} - 2$, $d)3 + \sqrt{2}$

14)*If the roots of the equation* $(a-1)(x^2 + x + 1)^2 = (a+1)(x^4 + x^2 + 1)$
are real and distinct then the value of $a \in$

$a)\ (-\infty, 3]$, $b)(-\infty, -2) \cup (2, \infty)$, $c)[-2,2]$, $d)[-3, \infty)$

15)*If* x, y, z *are in* $G.P.$ *and* $a^x = b^y = c^z$, *then*

$$a)log_b a = log_a c \quad , \quad b)log_c b = log_a c$$
$$c)log_c b = log_b a \quad , \quad d)none\ of\ these$$

16)*If* α, β *are real and* α^2, β^2 *are the roots of the equation* $a^2x^2 + x + 1 - a^2 = 0 (a > 1)$, *then* $\beta^2 =$

$$a)\ a^2 \quad ,b)1-\frac{1}{a^2} \quad ,c)1-a^2 \quad ,d)1+a^2$$

17)*If* x , $2x+2$ *and* $3x+3$ *are first three terms of a* $G.P.$, *then the fourth term is*

$$a)27 \quad ,b)-27 \quad ,c)13.5 \quad ,d)-13.5$$

18)*The value of* m *for which one of the roots of* $x^2-3x+2m=0$ *is double of one of the roots of* $x^2-x+m=0$ *is*

a) -2 , b)1 , c)2 , d) none of *these*

19)*If* a, b *and* c *are in* $A.P.$ *and* $b-a, c-b$, *and* a *are in* $G.P.$, *then* $a:b:c$ *is*

$$a)1:2:3 \quad ,b)1:3:5 \quad ,c)2:3:4 \quad ,d)1:2:4$$

20) *If* α, β, γ *are the roots of* $x^3-x^2-1=0$ *then the value of* $\frac{1+\alpha}{1-\alpha}+\frac{1+\beta}{1-\beta}+\frac{1+\gamma}{1-\gamma}$ *is equal to*

$$a)-5 \quad ,b)-6 \quad ,c)-7 \quad ,d)-2$$

21) $a, b, c, d \in R^+$ *such that* a, b *and* c *are in* $A.P.$ *and* b, c *and* d *are in* $H.P.$ *then*

$$a)\ ab=cd \quad ,b)ac=bd \quad ,c)bc=ad \quad ,d)none\ of\ these$$

22)*In a* ΔABC , *the internal angle bisector of* $< ABC$ *meets* AC *at* K . *If* $BC=2, CK=1$ *and* $BK=\frac{3\sqrt{2}}{2}$, *then find the length of side* AB

$$a)1 \quad , \quad b)2 \quad , \quad c)3 \quad , \quad d)4$$

23)*If* x *is real* , *then the maximum value of* $\frac{3x^2+9x+17}{3x^2+9x+7}$ *is*

$$a)\frac{1}{4} \quad , \quad b)41 \quad , \quad c)1 \quad , \quad d)17/7$$

24)*The* 15^{th}*term of the series* $2\frac{1}{2}+1\frac{7}{13}+1\frac{1}{9}+\frac{20}{23}+\cdots$ *is*

$a)\frac{10}{39}$ $,b)\frac{10}{21}$ $,c)\frac{10}{23}$ $,d)none\ of\ these$

25)$For\ x^2-(a+3)|x|+4=0\ to\ have\ real\ solutions\ ,the\ range\ of\ a\ is$

$a)(-\infty,-7]\cup[1,\infty)$ $,b)(-3,\infty)$ $,c)(-\infty,-7]$ $,d)[1,\infty)$

26)$The\ sum\ of\ i-2-3i+4\ldots..upto\ 100\ terms\ where\ i=\sqrt{-1}\ is$

$a)50(1-i)$ $,b)25i$ $.c)25(1+i)$ $,d)100(1-i)$

27)$Let\ x,y,z,t\ \ be\ real\ numbers\ x^2+y^2=9,z^2+t^2=4\ and\ xt-yz=6.$
$Then\ the\ greatest\ value\ of\ P=xz\ is$

$a)2$, $b)3$, $c)4$, $d)6$

28)$Let\ T_r\ and\ S_r\ be\ the\ r^{th}\ term\ and\ sum\ upto\ r^{th}\ of\ a\ series\ \ respectively.$
$If\ for\ an\ odd\ number\ n\ ,S_n=n\ and\ T_n=\frac{T_{n-1}}{n^2}\ then\ T_m(m\ being\ even)\ is$

$a)\frac{2}{1+m^2}$ $,b)\frac{2m^2}{1+m^2}$ $,c)\frac{(m+1)^2}{2+(m+1)^2}$ $,d)\frac{2(m+1)^2}{1+(m+1)^2}$

29)$The\ number\ of\ integral\ values\ of\ x\ satisfying$
$\sqrt{-x^2+10x-16}<x-2\ is$

$a)0$ $,b)1$ $,c)2$ $,d)3$

30)$The\ sum\ of\ the\ series\ \frac{x}{1-x^2}+\frac{x^2}{1-x^4}+\frac{x^4}{1-x^8}+\cdots\ to\ infinite\ terms$
$,if|x|<1\ ,is$

$a)\frac{x}{1-x}$ $,b)\frac{1}{1-x}$ $,c)\frac{1+x}{1-x}$ $,d)1$

31)$If\ x^2+ax-3x-(a+2)=0\ has\ real\ and\ distinct\ roots\ then\ ,minimum$
$value\ of\ \frac{a^2+1}{a^2+2}\ is$

$a)1$ $,b)0$ $,c)\frac{1}{2}$ $,d)\frac{1}{4}$

32)$If\ x, y, z\ \ are\ real\ and\ 4x^2 + 9y^2 + 16z^2 - 6xy - 12yz - 8zx = 0\ then\ x, y, z\ \ are\ \ in$

$a)A.P. \quad ,b)G.P. \quad ,c)H.P. \quad ,d)none\ of\ these$

33)$Consider\ a\ \Delta ABC\ and\ let\ a, b\ and\ c\ denote\ the\ lengths\ of\ the\ sides\ opposite\ to\ the\ vertices\ A, B\ and\ C\ , respectively\ .Suppose\ a = 2, b = 3, c = 4\ and\ H\ be\ the\ orthocentre\ .Find\ 15(HA)^2.$

$a)256 \quad ,b)146 \quad ,c)\ 196 \quad ,d)216$

34) $the\ value\ of\ the\ expression\ x^4 - 8x^3 + 18x^2 - 8x + 2\ when\ x = 2 + \sqrt{3}$

$a)2 \quad ,b)1 \quad ,c)0 \quad ,d)3$

35)$The\ sum\ of\ the\ series\ a - (a + d) + (a + 2d) - (a + 3d) + \cdots upto\ (2n + 1)\ terms\ is$

$a) - nd \quad ,b)a + 2nd \quad ,c)a + nd \quad ,d)2nd$

36)$The\ set\ of\ all\ possible\ real\ values\ of\ a\ such\ that\ the\ inequality\ (x - (a - 1))\ \big(x - (a^2 + 2)\big) < 0\ holds\ for\ all\ x \in (-1,3)\ is$

$a)(0,1) \quad ,b)(\infty, -1] \quad ,c)(-\infty, -1) \quad ,d)(1, \infty)$

37)$Let\ [t_n]\ be\ a\ sequence\ of\ integers\ in\ G.P.\ \ in\ which\ t_4 : t_6 = 1:4\ and\ t_2 + t_5 = 216\ .Then\ t_1\ is$

$a)\ 12 \quad ,b)\ 14 \quad ,c)\ 16 \quad ,d)\ none\ of\ these$

38) $If\ a, b\ and\ c\ are\ real\ numbers\ such\ that\ a^2 + b^2 + c^2 = 1\ , then\ ab + bc + ca\ lies\ in\ the\ interval$

$a)\left[\frac{1}{2}, 2\right] \quad ,b)[-1,2] \quad ,c)\left[-\frac{1}{2}, 1\right] \quad ,d)[-1,1/2]$

39) $If\ a, \frac{1}{b}, c\ and \frac{1}{p}, q, \frac{1}{r}\ form\ two\ arithmetic\ progression\ of\ the\ same\ common\ difference, then\ a, q, c\ are\ in\ A.P.\ if$

$a)\ p, b, r\ are\ in\ A.P. \quad , b) \frac{1}{p}, \frac{1}{b}, \frac{1}{r}\ are\ in\ A.P. \quad , c)\ p, b, r\ are\ in\ G.P. \quad , d)\ none\ of\ these$

40) $x1\ and\ x2\ are\ the\ roots\ of\ ax^2 + bx + c = 0\ and\ x1x2 < 0\ .Roots\ of\ x1(x - x2)^2 + x2(x - x1)^2 = 0\ are$

$a)\ real\ and\ opposite\ sign \quad , b)\ negative \quad , c) positive \quad , d) non\ real$

41) $If\ a, x\ and\ b\ are\ in\ A.P., a, y, and\ b\ are\ in\ G.P.\ and\ a, z, b\ are\ in\ H.P.\ such\ that\ x = 9z\ and\ a > 0, b > 0, then$

$a)|y| = 3z \quad , b) x = 3|y| \quad , c) 2y = x + z \quad , d) none\ of\ these$

42) $If\ \alpha, \beta\ be\ the\ roots\ of\ the\ equation\ (x - a)(x - b) + c = 0\ (c \neq 0), then\ the\ roots\ of\ the\ equation\ (x - c - \alpha)(x - c - \beta) = c\ are$

$a)\ a + c\ and\ b + c \quad , b) a - c\ and\ b - c \quad , c) a\ and\ b + c \quad , d) a + c\ and\ b$

43) $In\ \Delta ABC\ , if\ cosA + sinA - \frac{2}{cosB + sinB} = 0\ , then\ \frac{a + b}{c}\ is\ equal\ to$

$a)\sqrt{2} \quad , b) 1 \quad , d) 2\sqrt{2} \quad , c) \frac{1}{\sqrt{2}}$

44) $The\ 15^{th}\ term\ of\ the\ series\ 2\frac{1}{2}+1\frac{7}{13}+1\frac{1}{9}+\frac{20}{23}+\cdots is$

$a)\frac{10}{39}\quad ,b)\frac{10}{21}\quad ,c)\frac{10}{23}\quad ,d)none\ of\ these$

45)$The\ coefficient\ of\ x\ in\ the\ equation\ x^2+px+q=0\ was\ wrongly\ written\ as\ 17\ in\ place\ of\ 13\ and\ the\ roots\ thus\ found\ was-2\ and-15.\ Then\ the\ roots\ of\ the\ correct\ equation\ are$

$a)-3,10\quad ,b)-3,-10\quad ,c)3,-10\quad ,d)\ none\ of\ these$

46) $If\ \alpha,\beta\ be\ the\ roots\ of\ the\ equation\ 2x^2-35x+2=0\ ,then\ the\ value\ of\ (2\alpha-35)^3(2\beta-35)^3\ is\ equal\ to$

$a)8\quad ,b)1\quad ,c)64\quad ,d)\ none\ of\ these$

47) $consider\ a\ \Delta ABC\ and\ let\ a,b\ and\ c\ denote\ the\ lengths\ of\ the\ side\ opposite\ to\ vertices\ A\ ,B\ and\ C\ ,respectively\ .If\ a=1\ ,b=3\ and\ c=60°\ ,then\ sin^2B\ is\ equal$

$a)\frac{27}{28}\quad ,b)\frac{3}{28}\quad ,c)\frac{81}{28}\quad ,d)\frac{1}{3}$

48)$The\ least\ value\ of\ the\ expression\ x^2+4y^2+3z^2-2x-12y-6z+14\ is$

$a)1\quad ,b)no\ least\ value\quad ,c)0\quad ,d)none\ of\ these$

49) $Let\ S=\frac{4}{19}+\frac{4}{19^2}+\frac{4}{19^3}+\cdots upto\ \infty\ .Then\ S\ is\ equal\ to$

$a)\frac{40}{9}$ $,b)\frac{38}{81}$ $,c)\frac{36}{171}$ $,d)none\ of\ these$

50)$The\ number\ of\ roots\ of\ the\ equation\ \sqrt{x-2}(x^2-4x+3)=0\ is$

$a)three$ $,b)four$ $,c)one$ $,d)two$

SECTION B

[FOR CORRECT ATTEMPT +2 EACH , FOR WRONG ATTEMPT -1/ 2 EACH]

51)$In\ \Delta ABC\ ,let\ b=6\ ,c=10\ and\ r1=r2+r3+r\ then\ find\ the\ area\ of\ \Delta ABC$

$a)25$ $,b)30$ $,c)\ 70$ $,d)55$

52)$Let\ a,b\ and\ c\ be\ real\ numbers\ such\ that\ 4a+2b+c=0\ and\ ab>0\ .Then\ the\ equation\ ax^2+bx+c=0\ has$

$a)\ complex\ roots$ $,b)\ exactly\ one\ root$ $,c)real\ roots$ $,d)\ none\ of\ these$

53)$The\ value\ of\ 0.2^{log_{\sqrt{5}}(\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\cdots)}\ is$

$a)4$ $,b)log4$ $,c)log2$ $,d)none\ of\ these$

54)$If\ \alpha,\beta\ are\ the\ roots\ of\ the\ equation\ x^2-2x+3=0\ .Then\ the\ \ equation\ whose\ roots\ are\ P=\alpha^3-3\alpha^2+5\alpha-2\ and\ Q=\beta^3-\beta^2+\beta+5\ is$

$a)x^2+3x+2=0 \quad ,b)x^2-3x-2=0 \quad ,c)x^2-3x+2=0 \quad ,d)none\ of\ these$

55)$If\ S_n\ denotes\ the\ sum\ of\ first\ 'n'\ terms\ of\ an\ A.P.\ and\ \frac{S_{3n}-S_{n-1}}{S_{2n}-S_{2n-1}}=31\ ,then$ $the\ value\ of\ n\ is$

$a)21 \quad ,b)15 \quad ,c)16 \quad ,d)19$

56)$If\ X=2+2^{2/3}+2^{1/3}\ ,then\ the\ value\ of\ x^3-6x^2+6x\ is$

$a)3 \quad ,b)2 \quad ,c)1 \quad ,d)-2$

57)$If\ the\ p^{th},q^{th},r^{th}\ and\ s^{th}\ term\ of\ an\ A.P.\ are\ in\ G.P.\ then\ p-q,q-r,r-s\ are$ in

$a)A.P. \quad ,b)G.P. \quad ,c)H.P. \quad .d)none\ of\ these$

58)$If\ \alpha,\beta\ are\ the\ roots\ of\ ax^2+c=bx\ ,then\ the\ equation\ (a+cy)^2=b^2y\ in\ y\ has$ $the\ roots$

$a)\alpha\beta^{-1},\alpha^{-1}\beta \quad ,b)\alpha^{-2},\beta^{-2} \quad ,c)\alpha^{-1},\beta^{-1} \quad ,d)\alpha^2,\beta^2$

59)$Sum\ of\ three\ numbers\ in\ G.P.\ be\ 14\ .If\ one\ is\ added\ to\ first\ and\ second\ and\ 1\ is\ subtracted$ $from\ the\ third\ ,the\ new\ numbers\ are\ in\ A.P.The\ smallest\ of\ them\ is$

$a)\ 2 \quad ,b)\ 4 \quad ,c)\ 6 \quad ,d)10$

60)$If\ \alpha\ ,\beta\ are\ the\ roots\ of\ the\ equation\ ax^2+bx+c=0\ ,and\ \alpha+h\ ,\beta+h\ are\ the$ $roots\ of\ the\ px^2+qx+r=0\ ,then\ h\ is$

$a) -\frac{1}{2}\left(\frac{a}{b}-\frac{p}{q}\right)$ $,b)\left(\frac{b}{a}-\frac{q}{p}\right)$ $,c) 1/2(b/a-q/p)$ $,d)$ *none of these*

61) *If* $\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\cdots\infty=\frac{\pi^2}{6}$ *, then* $\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\cdots$ *equals*

$a)\frac{\pi^2}{8}$ $,b)\frac{\pi^2}{12}$ $,c)\frac{\pi^2}{3}$ $,d)\frac{\pi^2}{2}$

62) *If roots of* $x^2-(a-3)x+a=0$ *, are such that at least one of them is greater than* 2 *, then*

$a) a\in[7,9]$ $,b) a\in[7,\infty)$ $,c) a\in[9,\infty)$ $,d) a\in[7,9)$

63) *If* α,β,γ *and* σ *are the roots of the equation* $x^4+4x^3-6x^2+7x-9=0$*, then the value of* $(1+\alpha^2)(1+\beta^2)(1+\gamma^2)(1+\sigma^2)$ *is*

$a)9$ $,b)11$ $,c)13$ $,d)5$

64) *The sum of* 20 *terms of a series of which every term is* 2 *times the term before it, and every odd term is* 3 *times the term before it , the first term being unity is*

$a)\left(\frac{2}{7}\right)(6^{10}-1)$ $,b)\left(\frac{3}{7}\right)(6^{10}-1)$ $,c)\left(\frac{3}{5}\right)(6^{10}-1)$ $,d)$ *none of these*

65) *If* α,β,γ *are such that* $\alpha+\beta+\gamma=2$ *,* $\alpha^2+\beta^2+\gamma^2=6$ *,* $\alpha^3+\beta^3+\gamma^3=8$ *, then* $\alpha^4+\beta^4+\gamma^2$ *is equal to*

$a)$ 18 $,b)10$ $,c)15$ $,d)36$

SECTION C

[FOR CORRECT ATTEMPT +2 EACH , FOR WRONG ATTEMPT 0 EACH]

66) $The\ value\ of\ x\ satisfying\ the\ equation\ 2^{2x} - 8 \times 2^{x} = -12\ is$

$$a)1 + \frac{\log 3}{\log 2} \quad ,b)\frac{1}{2}\log 6 \quad ,c)1 + log\frac{3}{2} \quad ,d)1$$

67) $\frac{1}{\sqrt{2}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{11}} + \cdots n\ terms\ \ is\ equal\ to$

$$a)\frac{\sqrt{3n+2}-\sqrt{2}}{3} \quad ,b)\frac{n}{\sqrt{2+3n}+\sqrt{2}} \quad ,c)less\ than\ n \quad ,d)less\ than\ \sqrt{\frac{n}{3}}$$

68) $If\ the\ equations\ 4x^2 - x - 1 = 0, and\ 3x^2 + (\mu + \rho)x + \rho - \mu = 0\ have\ a\ root\ common\ then\ the\ rational\ values\ of\ \rho\ and\ \mu\ are$

$$a)\rho = -\frac{3}{4} \quad ,b)\rho = 0 \quad ,c)\mu = 3/4 \quad ,d)\mu = 0$$

69)$If\ p, q, r\ are\ in\ A.P\ , then\ which\ of\ this\ is\ true$

$a)p^{th}, q^{th}, r^{th}\ term\ of\ an\ A.P., are\ in\ A.P.$ $,b)p^{th}, q^{th}, r^{th}\ term\ of\ a\ H.P. are\ in\ H.P.$

$c)p^{th}, q^{th}, r^{th}\ term\ of\ a\ G.P. are\ in\ G.P.$ $,d)\ none\ of\ these$

70)$If\ the\ equations\ x^2 + bx - a = 0\ and\ x^2 - ax + b = 0\ have\ a\ common\ root\ then$

$$a)\ a + b = 0 \quad ,b)\ a = b \quad ,c)\ a - b = 1 \quad ,d)a + b = 1$$

71)$For\ an\ increasing\ A.P.\ a1, a2, a3, \ldots\ldots an\ \ if\ a1 + a3 + a5 = -12\ and\ a1a3a5 = 80\ then\ which\ of\ the\ following\ is/are\ true$

$a)a1 = -10 \quad ,b)a2 = -1 \quad ,c)a3 = -4 \quad ,d)a5 = +2$

72)$If\ x^3 + 3x^2 - 9x + c\ is\ of\ the\ form\ (x-\alpha)^2(x-\beta), then\ c\ is\ equal\ to$

$a)27 \quad ,b)-27 \quad ,c)5 \quad ,d)-5$

73)$The\ next\ term\ of\ the\ G.P.\ x, x^2 + 2\ and\ x^3 + 10\ is$

$a)\frac{729}{16} \quad ,b)6 \quad ,c)0 \quad ,d)54$

74)$If\ a, b, c\ are\ in\ G.P. then\ the\ roots\ of\ the\ equation\ ax^2 + bx + c = 0\ are\ in\ the\ ratio$

$a)\frac{1}{2}(-1 + i\sqrt{3}) \quad ,b)\frac{1}{2}(1 - i\sqrt{3}) \quad ,c)\frac{1}{2}(-1 - i\sqrt{3}) \quad ,d)\frac{1}{2}(1 + i\sqrt{3})$

75)$If\ \frac{1}{b-a} + \frac{1}{b-c} = \frac{1}{a} + \frac{1}{c}\ then$

$a)a, b, c\ are\ in\ H.P. \quad ,b)\ a, b, c\ are\ in\ G.P. \quad ,c)b = a + c \quad ,d)3a = b + c$