TODAY'S TARGETS

1 Last 5 Attempt PYQs

Q.1 The salaries of A, B and C in the ratio 2 : 3 : 5. If increment of 15%, 10% and 20% are allowed respectively to their salary, then what will be the new ratio of their salaries?

[July 2021]

A 3 : 3 : 10

B 10 : 11 : 20

C 23 : 33 : 60

D Cannot be determined

$A : B : C = 2 : 3 : 5$

$+15\% \mid 10\% \mid 20\%$

New ratio $\rightarrow 2+15\% : 3+10\% : 5+20\%$

$\Rightarrow \dfrac{10 \times 2 \cdot 3}{10} : \dfrac{10 \times 3 \cdot 3}{10} : 6 \times 10$

$\Rightarrow 23 : 33 : 60$

Q.3 If $A : B = 5 : 3$, $B : C = 6 : 7$ and $C : D = 14 : 9$, then the value of $A : B : C : D$
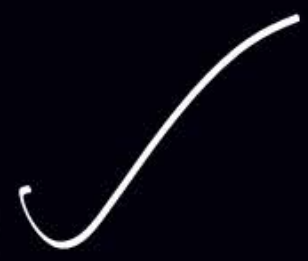
A $20 : 14 : 12 : 9$

B $20 : 9 : 12 : 14$

C $20 : 9 : 14 : 12$

D $20 : 12 : 14 : 9$

$A : \underline{B} = \overset{2\times}{5} : 3 \times 2 = \underline{10 : \textcircled{6}}$

$\underline{B : C} = \textcircled{6} : 7$

$A : B : C = 10 : 6 : \overset{\times 2}{7} \times 2 = 20 : 12 : 14$

$C : D = \quad 14 : 9$

$\Rightarrow A : B : C : D = 20 : 12 : 14 : 9$

If $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = 25/6$ then the value of x is

[July 2021]

A 64

B 4

C 16

D 2

$$\log_4 \overset{x}{} + \frac{1}{2} \log_{4^2} x + \log_{4^3} x + \log_{4^4} x = \frac{25}{6}$$

$$\Rightarrow \log_4 x + \frac{1}{2} \log_4 x + \frac{1}{3} \log_4 x + \frac{1}{4} \log_4 x = \frac{25}{6}$$

$$\Rightarrow \log_4 x \left(\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \right) = \frac{25}{6}$$

$$\Rightarrow \log_4 x \left(\frac{12+6+4+3}{12} \right) = \frac{25}{6}$$

$$\Rightarrow \left(\log_4 x \right) \left(\frac{25}{12} \right) = \frac{25}{6}$$

$$\log_4 x = 2$$

$$\Rightarrow x = 4^2 = 16$$

$-(xy+yz+zx) = -(-1) = 1 \Rightarrow -xy - yz - zx = 1$ — ②

P W

Q.5 If $xy + yz + zx = -1$, then the value of $\left(\dfrac{x+y}{1+xy} + \dfrac{z+y}{1+zy} + \dfrac{x+z}{1+zx}\right)$ is

$$\therefore \quad -xy = yz + zx$$
$$-(1+xy) = yz + zx$$
$$1 + xy = -(yz + zx) = -z(y+x)$$

$$-1 - yz = xy + zx$$
$$\Rightarrow 1 + yz = -x(y+z)$$

[July 2021]

$$-1 - zx = -xy + yz$$
$$1 + zx = -y(x+z)$$

A xyz

B $\dfrac{-1+y}{yz}$

$$\Rightarrow \quad \frac{x+y}{-z(y+x)} + \frac{z+y}{-x(y+z)} + \frac{x+z}{-y(x+z)}$$

C $\dfrac{1}{xyz}$

$$\Rightarrow \quad -\frac{1}{z} - \frac{1}{x} - \frac{1}{y}$$

$$\Rightarrow \quad \frac{-xy - yz - xz}{xyz} \Rightarrow \frac{1}{xyz} \qquad (\text{using a})$$

D $\dfrac{1}{x+y+z}$

Q.6 A bag has 105 coins containing some 50 paise, and 25 paise coins. The ratio of the number of these coins is 4: 3. The total value (in ₹) in the bag is

A 43.25

B 41.25

C 39.25

D 35.25

[Dec 2021]

$$50p \quad 25p$$
$$4 \quad : \quad 3$$

Let $50p \rightarrow ₹0.5 = \boxed{4x}$

$25p \rightarrow ₹0.25 = 3x$

Value = $0.5 \times 4x + 0.25 \times 3x$

$\Rightarrow 0.5 \times 4 \times 15 + 0.25 \times 3 \times 15$

$= 30 + 11.25 = 41.25$

$4x + 3x = 105$

$7x = 105$

$\Rightarrow x = \dfrac{105}{7} = 15$

Q.7 If $\log_{10} 3 = x$ and $\log_{10} 4 = y$, then the value of $\log_{10} 120$ can be expressed as

A $x - y + 1$

B $x + y + 1$

C $x + y - 1$

D $2x + y - 1$

$$\log_{10} 120 = \log_{10} 3 \times 4 \times 10$$

$$= \log_{10} 3 + \log_{10} 4 + \log_{10} 10$$

$$= x + y + 1$$

$$(\log_a a = 1)$$

[Dec 2021]

$$\log(x^6) = 6\log x \quad \log x + \underline{2 \times 2}\log x + \underline{3 \times 3}\log x = 14$$

$$14 \log x = 14$$

$$\underline{\log x = 1}$$

A 3

B 4

C 5

$$\Rightarrow \underline{6 \log x = 6 \times 1 = 6}$$

D 6

Q.9 Incomes of **R** and **S** are in the ratio $7:9$ and their expenditures are in the ratio $4:5$. Their total expenditure is equal to income of **R**. What is the ratio of their savings?

A $23:36$

B $28:41$

C $31:43$

D $35:46$

$Inc - Exp = Savings$

[Dec 2021]

	Inc	Exp	Savm
R	$7x$	$4y$	$7x-4y$
S	$9x$	$5y$	$9x-5y$

Given

$$4y+5y=7x$$

$$9y=7x$$

$$y=\frac{7x}{9}$$

$$Saving \ Ratio := \frac{7x-4y}{9x-5y} = \frac{7x-4\left(\frac{7x}{9}\right)}{9x-5\left(\frac{7x}{9}\right)} = \frac{\frac{63x-28x}{9}}{\frac{81x-35x}{9}} = \frac{35x}{46x}$$

$$Saving \ Ratio = 35:46$$

Q.10 The value of $\dfrac{6^{n+4}+3^{n+3}\times 2^{n+3}}{5\times 6^n+6^n}$ is :

$a^x b^x = (a\times b)^x$

$6^{n+4} = 6^{n+3+1} = 6^{n+1}\cdot 6$

A 232

B 242

C 252

D 262

$$= \frac{6^{n+4}+(3\times 2)^{n+3}}{6^n(5+1)}$$

$$\Rightarrow \frac{6^{n+3}\cdot 6 + 6^{n+3}}{6^n(6)} \Rightarrow \frac{6^{n+3}(6+1)}{6^{n+1}}$$

$$\Rightarrow 6^{n+3-n-1}$$

$$(7)$$

$$\Rightarrow 6^2(7) \Rightarrow 252$$

Q.11 In a department, the number of males and females are in the ratio $3:2$. If two males and 5 females join department, then the ratio becomes $1:1$, initially the number of female in the department is

[Dec 2021]

A 9

B 6

C 3

D 8

$$M \quad\quad F$$
$$\underset{+2}{3x} : \underset{+5}{\boxed{2x}} = 1:1$$

$$\Rightarrow \frac{3x+2}{2x+5} = \frac{1}{1}$$

$$\Rightarrow 3x+2 = 2x+5$$

$$\Rightarrow 3x-2x = 5-2$$

$$\Rightarrow x=3$$

$$Female = 2x = 2\times3 = 6$$

Q.12 If $\left(\dfrac{3a}{2b}\right)^{2x-4} = \left(\dfrac{2b}{3a}\right)^{2x-4} = 0$, for some a and b, then the value of x is
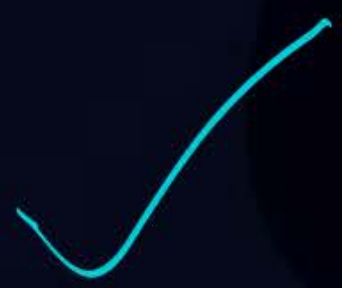
$\overrightarrow{2x-4} \to 0$

$= 1$

CCW

$p^0 = 1 = q^0$

$a^0 = 1 = b^0$

$$2x - 4 = 0$$
$$x = \dfrac{4}{2} = 2$$

A 8

B 6

C 4

D 2

Q.13 The value of $\left(1 - \sqrt[3]{0.027}\left(\frac{5}{6}\right)\left(\frac{1}{2}\right)^2\right)$ is :

$$0.027 = 0.3 \times 0.3 \times 0.3 = (0.3)^3 \qquad \text{[Dec 2021]}$$

A 11/16

B 13/16

C 15/16

D 1

$$= \left(1 - (0.027)^{\frac{1}{3}}\left(\frac{5}{6} \times \frac{1}{4}\right)\right)$$

$$= 1 - ((0.3)^3)^{\frac{1}{3}}\left(\frac{5}{24}\right)$$

$$\Rightarrow 1 - \frac{\overset{3}{\cancel{15}} \times 1}{\underset{8}{\cancel{24}} \underset{2}{\cancel{10}}} \Rightarrow 1 - \frac{1}{16} = \frac{15}{16}$$

Q.14 Find the value of z from $\left(\sqrt{9}\right)^{-8} \times \left(\sqrt{3}\right)^{-5} = 3^z$

[June 2022]

A $\dfrac{2}{21}$

B $\dfrac{-21}{2}$

C $\dfrac{21}{2}$

D $\dfrac{-2}{21}$

$$\left(\left(3^2\right)^{\frac{1}{2}}\right)^{-8} \times \left(3^{\frac{1}{2}}\right)^{-5} = 3^z$$

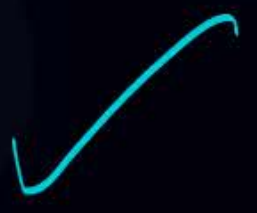$$\Rightarrow 3^{-8} \times 3^{-\frac{5}{2}} = 3^z$$

$$\Rightarrow 3^{-8-\frac{5}{2}} = 3^z$$

$$\Rightarrow z = -8 - \frac{5}{2} = \frac{-16-5}{2} = \frac{-21}{2}$$

Q.16 Find the value of $\dfrac{3t^{-1}}{t^{\frac{-1}{3}}}$

A $\dfrac{3}{t^{\frac{2}{3}}}$

B $\dfrac{3}{t^{\frac{3}{2}}}$

C $\dfrac{3}{t^{\frac{1}{3}}}$

D $\dfrac{3}{t^{2}}$

$$= \dfrac{3t^{-1}}{t^{-\frac{1}{3}}} = 3t^{-1+\frac{1}{3}} = 3t^{\frac{-3+1}{3}} = 3t^{-\frac{2}{3}} = \dfrac{3}{t^{\frac{2}{3}}}$$

Q.16 If $\log_a \sqrt{3} = \frac{1}{6}$, find the value of a

[June 2022]

A 9

B 81

C 27

D 3

$$\left(a^{\frac{1}{6}}\right)^6 = \left(\sqrt{3}\right)^6$$

$$\Rightarrow a = \left(3^{\frac{1}{2}}\right)^6 = 3^{\frac{1}{2} \times 6} = 3^3 = 27$$

A pqr

B $\dfrac{1}{pqr}$

C 1

D 0

$$\log\left(\dfrac{p^2}{qr} \times \dfrac{q^2}{pq} \times \dfrac{r^2}{pq}\right)$$

$$= \log(1) = 0$$

Q.18 If $\log_{10} 2 = y$ and $\log_{10} 3 = x$, then the value of $\log_{10} 15$ is:

[Dec 2022]

A. $x - y + 1$

B. $x + y + 1$

C. $x - y - 1$

D. $y - x + 1$

$$\log_{10} \frac{30}{2} = \log_{10} 30 - \log_{10} 2$$

$$= \log_{10} 3 \times 10 - \log_{10} 2$$

$$\Rightarrow \log_{10} 3 + \log_{10} 10 - \log_{10} 2 \quad (\log_a a = 1)$$

$$\Rightarrow x + 1 - y$$

$\log_3 4 . \log_4 5 \log_5 6 . \log_6 7 . \log_7 8 . \log_8 9$ equal to :

[Dec 2022]

A 3

B 2

C 1

D 0

$$= \frac{\log 4}{\log 3} \times \frac{\log 5}{\log 4} \times \frac{\log 7}{\log 6} \times \frac{\log 8}{\log 7} \times \frac{\log 9}{\log 8} = \frac{\log 9}{\log 3}$$

$$\Rightarrow \frac{\log 3^2}{\log 3} \Rightarrow 2\frac{\log 3}{\log 3} = 2$$

By simplifying $(2a^3b^4)^6 / (4a^3b)^2 \times (a^2b^2)$, the answer will be

[Dec 2022]

A $\quad 4a^2b^3$

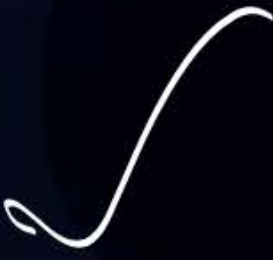B $\quad 4a^6b$

C $\quad 4a^{10}b^{10}$

D $\quad 4a^{10}b^{20}$

$$\Rightarrow \frac{2^6 \, a^{3\times6} \, b^{4\times6}}{(4^2 a^{3\times2} b^2)(a^2 b^2)}$$

$$\Rightarrow \frac{\overset{4}{\cancel{64}} \; a^{18} \, b^{24}}{\cancel{16} \; a^6 a^2 b^2 b^2}$$

$$\Rightarrow 4\left(a^{18-6-2} \; b^{24-2-2}\right)$$

$$\Rightarrow 4\left(a^{10} b^{20}\right)$$

Q.21 A group of 400 soldiers posted at border area had a provision for 31 days. After 28 days 280 from this group were called back. Find the number of days for which the remaining rations will be sufficient?

A 3

B 6

C 8

D 10 ✓

*

$$31 \text{ days} \quad \boxed{400}$$

Total ration → $31 \times 400 = \underline{12400}$

$$-28 \times 400 = \underline{11200}$$
$$\underline{1200}$$

After 28 day → 3 days $\dfrac{1200}{400}$

$$= 3 \times 400 = \boxed{1200}$$

Total = 400
−280
Remain = $\underline{120}$

Ratio = $\dfrac{1200}{120} = 10$ days

Q.22 A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1,000 more than D, what is B's share?

[Dec 2022]

A 2,000

B 1500

C 2500

D 1000

$$A's = 5x$$
$$B's = 2x \rightarrow 2 \times 1000 = 2000$$
$$C's = 4x$$
$$D's = 3x$$

$$4x = 3x + 1000$$
$$\Rightarrow x = 1000$$

If $x = y^a, y = z^b, z = x^c$, then the value of abc is

[June 2023]

A 1

B 2

C 3

D 4

$$z = (y^a)^c$$

$$\Rightarrow z = y^{ac}$$

$$\Rightarrow z = (z^b)^{ac}$$

$$\Rightarrow z^1 = z^{abc}$$

$$\Rightarrow \boxed{1 = abc}$$

Q.24 If $\sqrt[3]{a} + \sqrt[3]{b} + \sqrt[3]{c} = 0$ then find the value of $\left(\dfrac{a+b+c}{3}\right)^3$.

[June 2023]

$*$ $a^{1/3} + b^{1/3} + c^{1/3} = 0$

$a^3 + b^3 + c^3 - 3abc = 0$ if $a + b + c = 0$ $*$

$\rightarrow a^3 + b^3 + c^3 = 3abc$

or $p^3 + q^3 + r^3 = 3pqr$ if $p + q + r = 0$

Let $p = a^{1/3}, q = b^{1/3}, r = c^{1/3}$

A abc ✓

B $9abc$

$a^{1/3} + b^{1/3} + c^{1/3} = 0 \Rightarrow (a^{1/3})^3 + (b^{1/3})^3 + (c^{1/3})^3 = 3(a^{1/3} \cdot b^{1/3} \cdot c^{1/3})$

C $1/abc$

$\Rightarrow a + b + c = 3(abc)^{1/3}$

Put this in given

D $1/9abc$

$\Rightarrow \left(\dfrac{\cancel{3}(abc)^{1/3}}{\cancel{3}}\right)^3 \Rightarrow (abc)^{\frac{1}{3} \times 3} \Rightarrow abc$

Q.25 The value of $[\log_{10}(5\log_{10} \underline{100})]^2$ is

[June 2023]

$$= \left[\log_{10} 5 \overbrace{\log_{10} 10^2}\right]^2$$

$$= \left[\log_{10}(5 \times 2 \times \log_{10} 10)\right]^2$$

$$\Rightarrow \left[\log_{10}(10 \times 1)\right]^2 = \left[\log_{10} 10\right]^2 = 1^2 = 1$$

A ✓ 1

B 2

C 10

D 25

Q.26 Given that $\log_{10} x = m + n - 1$ and $\log_{10} y = m - n$, the value of $\log_{10}\left(\dfrac{100x}{y^2}\right)$ expressed in terms of m and n is

[June 2023]

A $1 - m + 3n$

B $m - 1 + 3n$

C $m + 3n + 1$

D $m^2 - n^2$

$\log_{10}(100) + \log x - \log y^2$

$\Rightarrow 2\log_{10}\underset{4}{\underset{10}{\underset{}{10}}} + \log x - 2\log y$

$\Rightarrow 2(1) + m+n-1 - 2(m-n)$

$\Rightarrow 2 + m+n-1 -2m+2n$

$\Rightarrow 1 - m + 3n$

Thank You !