(A) ANSWERS (6)

1. (b)
$$\begin{array}{r|l} 8958 & 94 \\ 81 & \\ \hline 189 & 858 \\ & 756 \\ \hline & 102 \end{array}$$

Now, $[(94+1)^2 - 8958]$

$= (9025 - 8958)$

$= \boxed{67}$

2. (b) HCF of 60, 48, 36 and 24 is 12.

$2^{\frac{60}{12}}$; $3^{\frac{48}{12}}$; $4^{\frac{36}{12}}$; $5^{\frac{24}{12}}$

2^5 ; 3^4 ; 4^3 ; 5^2

(32) (81) (64) (25)

∴ The greatest number is $\boxed{3^{48}}$

3. (c) $\sqrt{8 - 2\sqrt{15}}$

$= \pm\sqrt{(\sqrt{5})^2 + (\sqrt{3})^2 - 2.\sqrt{5}.\sqrt{3}}$

$= \pm\sqrt{(\sqrt{5} - \sqrt{3})^2} = \boxed{\pm(\sqrt{5} - \sqrt{3})}$

4. (a) LCM $= (x^2 + 6x + 8)(x+1)$

$= (x+4)(x+2)(x+1)$

HCF $= (x+1)$

Now; 1st expression $= (x^2 + 3x + 2) = (x+1)(x+2)$

As We know; LCM × HCF = Product of two expression

∴ $(x+4)(x+2)(x+1) \times (x+1) = (x+1)(x+2) \times$ 2nd ex

∴ 2nd expression $= (x+4)(x+1)$

$= \boxed{(x^2 + 5x + 4)}$

5 (b) Let the numbers are 29a and 29b.
a and b eachother co-prime.

$\therefore$ [redacted]

$29ab = 4147 \Rightarrow ab = 143$

$\Rightarrow$ [redacted]

thus $ab = (11 \times 13)$

Let, $a = 11$ and $b = 13$

$\therefore$ Sum of the numbers $= 29(a+b) = 29(11+13)$

$= \boxed{696}$

6 (b) Required time $\Rightarrow$ Lcm of $(20, 30, 40)$ is 120.

$\therefore$ 120 min $=$ 2 hours.

Hence, the bells will simultaneously ring after 2 hours; ie at $\boxed{1\ Pm}$

7 (b) $1 + (3+1)(3^2+1)(3^4+1)(3^8+1)(3^{16}+1)(3^{32}+1)$
$(3^{32}+1)$

$= 1 + \frac{1}{2}(3-1)(3+1)(3^2+1)(3^4+1) - - - (3^{32}+1)$
$(3^{32}+1)$

$= 1 + \frac{1}{2}(3^2-1)(3^2+1) - - - (3^{32}+1)$

$= 1 + \frac{1}{2}(3^4-1)(3^4+1) - - - (3^{32}+1)$

$\therefore$ Finally; We can Write $\longrightarrow$

$= 1 + \frac{1}{2}(3^{32}+1)(3^{32}-1)$

$= 1 + \frac{1}{2}(3^{64}-1)$

$= \boxed{\frac{3^{64}+1}{2}}$

[A] ANSWERS (8)

8. (d) $\dfrac{(6.25)^{\frac{1}{2}} \times (0.0144)^{\frac{1}{2}} + 1}{(0.027)^{-\frac{1}{3}} \times (81)^{-\frac{1}{4}}}$

$= \dfrac{(2.5 \times 0.12) + 1}{0.3 \times 3}$

$\dfrac{1.3}{0.9} = \dfrac{13}{9}$

$= 1.444\ldots$

$= \boxed{1.\overline{4}}$

9. (d) Let the present height be H cm.

$\therefore H = 64\left(1 + \frac{1}{8}\right)^2 \Rightarrow H = \left(64 \times \frac{81}{64}\right)$

$= \boxed{81 \text{ cm}}$

10. (d) 10 chairs = 4 tables

$\Rightarrow$ 5 chairs = 2 tables

Now; 15 chairs + 2 tables = ₹ 4000

$\therefore$ 20 chairs = ₹ 4000

Now; 2 tables = 5 chairs

$\frac{1}{3}$ " = $\frac{15}{2}$ "

$\therefore$ 12 chairs + 3 tables = $\left(12 + \frac{15}{2}\right) = \frac{39}{2}$ chairs

20 chairs = 4000

1 " = $\frac{4000}{20}$

$\frac{39}{2}$ " = $\left(\frac{4000}{20} \times \frac{39}{2}\right) = \boxed{₹\ 39000}$

(A) ANSWERS :- <1>

11. (d)

A	B	
2	3	[1 yr ago from now] → (×2)
5	7	[1 yr hence] (×1)

New ratio

A	B	
4	6	(1 year ago)
5	7	(1 year hence)

∴ (7 − 6) = 1 unit

∴ Now 1 unit ⟶ 8 years.

4 " ⟶ 32 yrs (A)

6 " ⟶ 48 " (B)

∴ Present age of A = (32 + 4) yrs = **36 yrs**

Present age of B = (48 + 4) yrs = **52 yrs**

12. (c) The pattern goes like = (7×6) − 1 = 41 → (A)

{(91×5) − 2} = 203 ⟶ (B)

{(203×4) − 3} = 809 ⟶ (C)

{(809×3) − 4} = **2423 ⟶ (D)**

{(2423×2) − 5} = 4841 ⟶ (E)

13. (c) ? 6 24 60 120 210

Now, The pattern goes like → $(1)^3 - 1 = 0$ → (i)

$(2)^3 - 2 = 6$ → (ii)

$(3)^3 - 3 = 24$ → (iii)

$(4)^3 - 4 = 60$ → (iv)

$(5)^3 - 5 = 120$ → (v)

$(6)^3 - 6 = 210$ → (vi)

∴ Required answer is :→ **0**

14. (a) LCM of 32, 40, 48 and 60 is 480.

∴ Required answer is: $\left(\frac{6000}{480}\right) - \left(\frac{4000}{480}\right) = 4$

[∵ We should take the quotient only]

15. (d) $0.4777 \ldots = 0.4\overline{7} = \frac{47-4}{90} = \frac{43}{90}$

16. (a) Let the average expenditure of 9 persons = ₹x

According to the question:-

$(12 \times 8) + (x + 16) = 9x$

$\Rightarrow 8x = 112$

$\Rightarrow x = 14$

$\therefore 9x = ₹126$

17. (d) Let the weight of the fresh grapes be x.

Quantity of water in it $= \frac{80x}{100} = \frac{4x}{5}$

$\therefore$ Amount of pulp $= \frac{x}{5}$

Quantity of water in 5000 kg dry grapes $= \left(5000 \times \frac{10}{100}\right)$ $= 50$ kg

Remaining pulp $= 450$ kg

$\therefore \frac{x}{5} = 450 \rightarrow x =$ **2250 kg**

18. (c) $\frac{20}{80} = \frac{1}{4}$th part

$\therefore \left(\frac{1}{4} \times 5\right) + \frac{3}{4}x = 10$

$\Rightarrow \frac{3x}{4} = \frac{35}{4}$

$\Rightarrow x = \frac{35}{3} =$ **$11\frac{2}{3}\%$**

19. (b) Hence, $n = 16$

$\therefore$ Required number of straight lines $= {}^nC_2 = \frac{n(n-1)}{2}$

${}^{16}C_2 = \left(\frac{16 \times 15}{2}\right) =$ **120**

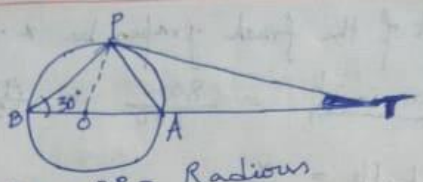
20. (c) Total number of possible arrangements for 4 boys and 3 girls in a queue $= 7!$

When they occupy alternate position; then the arrangement would be like BG BG BG B. Thus;

total number of possible arrangment $= (4! \times 3!)$

Required Probability $= \frac{4! \times 3!}{7!} =$ **$\frac{1}{35}$**

21. (b)



Now; $BO = OP =$ Radious

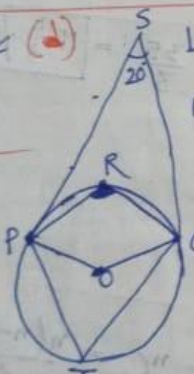
$\therefore \angle OBP = \angle OPA = 30^\circ$

We know that; $\angle OPT = 90^\circ$; then $\angle BPT = 120^\circ$

$\therefore$ In $\triangle PBT$; $\angle PTB = \{180^\circ - (120^\circ + 30^\circ)\}$

$= \boxed{30^\circ}$

22. (d)



Let T is any point on the major arc.

Now; join PO; OQ; QR and RP.

Then join PT and QT.

In a quadrilateral POQS;

$\angle PSQ = 20^\circ$; $\angle OPS = \angle OQS = 90^\circ$

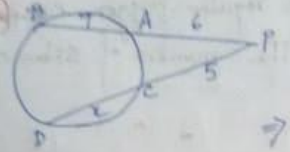
$\therefore \angle POQ = \left[360^\circ - \{20^\circ + (90^\circ \times 2)\}\right] = 160^\circ$

$\therefore \angle PTQ = \frac{1}{2} \angle POQ = \left(\frac{160^\circ}{2}\right) = 80^\circ$

Now; $\angle PRQ = (180^\circ - 80^\circ) = \boxed{100^\circ}$

(A) ANSWERS :- <13>

33. (A)



$\therefore PA \times PB = PC \times PD$

$\Rightarrow 6 \times 15 = 5(x+5)$

$\Rightarrow \boxed{x = 13}$

24. (B) $\sin 1^\circ . \sin 2^\circ . \sin 3^\circ \ldots \sin 180^\circ \ldots \sin 196^\circ$

Since; $\sin 180^\circ = 0$; then the product will become 0.

$\therefore$ Required answer is $\boxed{0}$.

25. (C) Since; α and β are complementary angles;

$\therefore \alpha + \beta = 90^\circ \Rightarrow \alpha = (90^\circ - \beta)$

Now; $\sqrt{\cos\alpha . \operatorname{cosec}\beta - \cos\alpha . \sin\beta}$

$= \sqrt{\frac{\cos\alpha}{\sin\beta} - \cos\alpha . \sin\beta}$ $\left[\because \sin\beta = \sin(90^\circ - \alpha) = \cos\alpha\right.$

$= \sqrt{\frac{\cos\alpha}{\cos\alpha} - \cos\alpha . \cos\alpha}$

$= \sqrt{1 - \cos^2\alpha}$ $\left[\because \sin^2\alpha + \cos^2\alpha = 1\right]$

$= \sqrt{\sin^2\alpha}$

$= \boxed{\sin\alpha}$