ACE OF PACE

ADVANCED (CODE - 01) **ANSWERS KEY** **DATE: 14/04/2019**

Question	Answer
1	A
2	D
3	D
4	B
5	B
6	B
7	B
8	B
9	C
10	C
11	D
12	C
13	A
14	A
15	A
16	C
17	A
18	C
19	C
20	D
21	B
22	D
23	C
24	C
25	D
26	3
27	2

SECTION A : SOLUTION

1. **(A)**

Let $\sqrt{n-1}+\sqrt{n+1}=\frac{a}{b}$ ...(1) (a, b are positive integers)

Then $\frac{b}{a}=\frac{1}{\sqrt{n-1}+\sqrt{n+1}}=\frac{\sqrt{n+1}-\sqrt{n-1}}{2}$ ...(2)

From (1) and (2) $\sqrt{n+1}$ & $\sqrt{n-1}$ will be rational

$\therefore$ $n + 1$ & $n - 1$ are perfect squares of positive integer which is not possible.

2. **(D)**

$3^{13}-3^{10}=3^{10}\left(3^3-1\right)=3^{10}\left(27-1\right)$

$=26\times3^{10}$

$=2\times13\times3^{10}$

3. **(D)**

For $P(x)=2x^3+ax^2+3x-5$

$p(2)=16+4a+6-5=17+4a$

For $Q(x)=x^3+x^2-2x+a$

$Q(2)=8+4-4+a=8+a$

$\therefore$ $17+4a=8+a \Rightarrow a=-3$

4. **(B)**

Let numerator = x & denominator = y

$\therefore$ $\frac{x+1}{y+1}=\frac{4}{5} \Rightarrow 5x-4y=-1$

& $\frac{x-5}{y-5}=\frac{1}{2} \Rightarrow 2x-y=5$

Solving : $x=7, y=9$

5. **(B)**

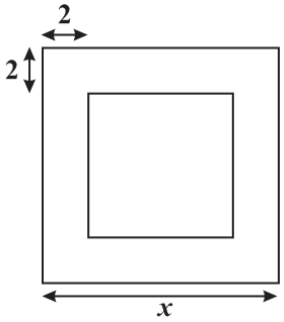
Let length of side of chess board = x

Then area of 64 squares $=\left(x-4\right)^2$

$\therefore$ $\left(x-4\right)^2=64\times6.25$

$\Rightarrow$ $x-4=8\times2.5$

$\Rightarrow$ $x=24$



6. **(B)**

$\frac{\text{Perimeter of } \Delta ABC}{\text{Perimeter of } \Delta DEF}=\frac{BC}{EF}$

$\therefore \quad \frac{30}{18} = \frac{9}{x} \Rightarrow x = 5.4$

7. (B)

Since, $\frac{AB}{AC} = \frac{BD}{CD}$, therefore AD is bisector of $\angle BAC$.

$\therefore \quad \angle BAD = 30^\circ$

$\therefore \quad \angle ABD = 180^\circ - (80^\circ + 60^\circ)$

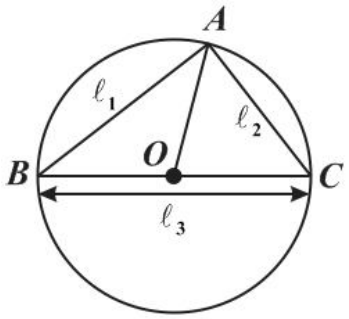
$= 40^\circ$

8. (B)

$\ell_3 = 2\ell_1 \Rightarrow BC = 2AB$

$\Rightarrow \quad AB = OB = OA$

$\therefore \quad \angle ABO = 60^\circ$



9. (C)

Diameter of n^{th} circle $= \frac{10}{2^{n-1}}$

$\therefore \quad \frac{10}{2^{n-1}} < 0.01 \Rightarrow 2^n > 2000$

For $n = 11$, $2^{11} = 2048$

10. (C)

Volume of cylinder $= 3 \times \frac{\pi r^2 h}{3} - \frac{1}{3}\pi r^2 h$

$= \frac{2}{3}\pi r^2 h = \pi r^2 \left(\frac{2h}{3}\right)$

11. (D)

Total marks = 30×45

Corrected Sum = $30 \times 45 + 45 - 15$

$\therefore \quad$ New average $= \frac{30 \times 45 + 45 - 15}{30} = 46$

12. (C)

Let distance be d km

Then, $\frac{d}{4} - \frac{d}{6} = \frac{10}{60} \Rightarrow d = 2\,\text{km}$

$\therefore$ Required speed $= \dfrac{2}{10/60} = 12\,\text{kmph}$ ($\because$ difference in time = 10 minutes)

13. (A)

Part of job completed in first 5 days

$$= \frac{1}{35} + \frac{2}{35} + \frac{3}{35} + \frac{4}{35} + \frac{5}{35} = \frac{3}{7}$$

Remaining part $= \dfrac{4}{7}$

Time taken for remaing part $= \dfrac{4/7}{5\left(\dfrac{1}{35}\right)} = 4$

$\therefore$ Total days = 5 + 4 = 9 days

14. (A)

$SI_1 = SI_2 = \dfrac{840}{2} = 420$

Difference between CI and SI for 2 years is the interest on the first year's SI.

$\therefore$ $882 - 840 = R\,\%\,(420)$

$\Rightarrow$ $R = 10\%$

15. (A)

$c = 2a,\ b^2 - 3a^2 = 0 \Rightarrow b = \sqrt{3}a$

$\therefore$ $a : b : c = 1 : \sqrt{3} : 2$

$\therefore$ $\angle A = 30^\circ, \angle B = 60^\circ, \angle C = 90^\circ$

$\therefore$ $\angle ABC = 60^\circ$

16. (C)

$(3a + 2b + 3c + 2a + 3b + 2c)(3a + 2b + 3c - 2a - 3b - 2c) + 5b^2$

$= 5(a + b + c)(a - b + c) + 5b^2$

$= 5\left[(a + c)^2 - b^2 + b^2\right] = 5(a + c)^2$

$\therefore$ Square root $= \sqrt{5}(a + c)$

17. (A)

$(a - 2)^2 + (b + 1)^2 = 0$

$\therefore$ $a = 2$ & $b = -1$

$\therefore$ $a^2 + b^2 = 5 = 3a + b$

18. (C)

$$\left(a + \frac{1}{a}\right)^3 = 27$$

$\Rightarrow \quad a^3 + \frac{1}{a^3} = 18$

19. (C)

$n^4 + 4 = n^4 + 4n^2 + 4 - 4n^2 = \left(n^2 + 2\right)^2 - \left(2n\right)^2$

$= \left(n^2 + 2n + 2\right)\left(n^2 - 2n + 2\right)$

Where $n^2 + 2n + 2 = 1 \Rightarrow n = -1$

Where $n^2 - 2n + 2 = 1 \Rightarrow n = 1$

20. (D)

7^{95} is $7^{4n+3}\left(n \in N\right) \Rightarrow$ unit digit is 3

3^{58} is $3^{4k+2}\left(k \in N\right) \Rightarrow$ unit digit is 9

$\therefore$ Unit digit of $7^{95} - 3^{58}$ is 4.

21. (B)

$xy > 0 \Rightarrow x > 0, y > 0$ or $x < 0, y < 0$

$\therefore$ 1^{st} or 3^{rd} quadrant.

22. (D)

One digit is removed from the end and the beginning alternately.

23. (C)

24. (C)

A will be uncle of *B*.

25. (D)

Total number of rectangles = 12

SECTION B : SOLUTION

26. **3**

$$\frac{1}{a}+\frac{1}{b}=\frac{1}{5}$$

$\Rightarrow \quad 5(a+b)=ab$

$\Rightarrow \quad ab-5a-5b=0$

$\Rightarrow \quad (a-5)(b-5)=25$

(i) $a-5=25 \Rightarrow a=30$

$b-5=1 \Rightarrow b=6$

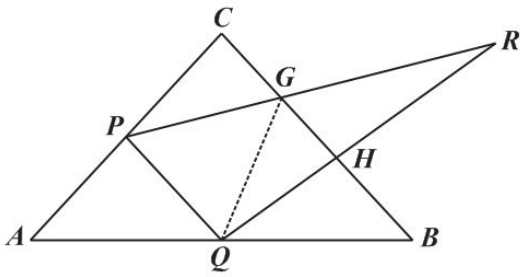
(ii) $a-5=1 \Rightarrow a=6$

$b-5=25 \Rightarrow b=30$

(iii) $a-5=5 \Rightarrow a=10$

$b-5=5 \Rightarrow b=10$

27. **2**



Area of $\Delta PQG=\frac{1}{2}$ Area of ΔPQR ($\because$ G is mid-point of PR)

& Area of $\Delta PQG=\frac{1}{4}$ Area of ΔABC ($\because$ $PQ \parallel BC$)

$\therefore$ Area of $\Delta ABC=2$ Area of ΔPQR