1. The fraction $\dfrac{4}{37}$ is written in the decimal form $a_1, a_2, a_3 \ldots$ The value of a_{2017} is

A. 2   B. 3   C. 4   D. 5

2. The number of integers x satisfying the equation $(x^2 - 3x + 1)^{x+1} = 1$ is

A. 2   B. 3   C. 4   D. 5

3. The number of two digit numbers ab such that the number $ab - ba$ is a prime number is

A. 0   B. 1   C. 2   D. 3

4. If $A = \dfrac{5425}{1444} - \dfrac{2987}{3045} - \dfrac{493}{4284}$, then

A. $1 < A < 2$ B. $2 < A < 3$ C. $3 < A < 4$ D. $A < 1$

5. What is the 2017th letter in *ABRACADABRAABRACADABRA.,.,* where the word *ABRACADABRA is* repeatedly written?

A. *A*   B. *B*   C. *C.*   D. *R*

6. How many of the following statements are true?

(a) A 10% increase followed by another *5%* increase is equivalent to a 15% increase

(b) If the radius of a circle is doubled then the ratio of the area of the circle to the circumference is doubled

(c) If a positive fraction is subtracted from 1 and the resulting fraction is again subtracted from 1 we get the original fraction.

A. 0   B. 1   C. 2   D. 3

7. In the adjoining figure the breadth of the rectangle is 10 units. Two semicircles are drawn on the breadth as diameter. The area of the shaded region is 100 sq units. The shortest distance between the Semicircles is

A. $\dfrac{5\pi}{2}$ B. 5π C. $\dfrac{5\pi}{3}$ D. $\dfrac{3\pi}{4}$

8. When you arrange the following in descending order

A. 15% of 30   B. 8% of 15   C. 20% of

D. 26%. of 10   E. 9% of 25

the middle one is

A. 15% of 30   B. 8% of 15

C. 20% of 20   D. 26% of 10

9. A boy aims at a target shown in the figure. When he hits the center circle he gets 7 points, first annular region 5 points and second annular region 3 points. He shoots six times. Which one of the following is a possible score?
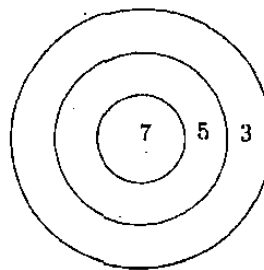
A. 16   B. 26
C. 19   D. 41

10. After simplifying the fraction we get a term independent of

$$\left\{ \dfrac{a + \dfrac{b-a}{1+ab}}{1 - \dfrac{a(b-a)}{1+ab}} \right\}\left\{ \dfrac{\dfrac{x+y}{.1-xy} - y}{1 + \dfrac{y(x+y)}{1-xy}} \right\}$$

A. *a, y*   B. *b. x*   C. 0, 6   D. *x, y*

11. If 7 Rasagullas are distributed to each boy of a group, 10 rasagullas would be left. If 8 are given to each boy then 5 rasagullas would be left. So the person who distributes the rasagullas brought 15 more rasagullas and distributed the same number (*x*) rasagullas to each. There is *no* rasagulla left, Then *x* is

A. 10   B. 11   C. 12   D. 14

12. In the adjoining diagram all squares are of the same size. The total area of the figure is 288 square cms. The perimeter of the figure (in cm) is
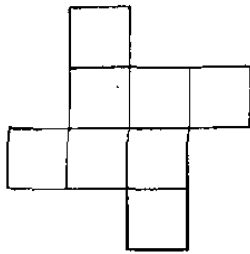
A. 86
B. 96
C. 106
D. 92

13. When Newton was a primary school student he had to multiply a number by 5. But by mistake he divided the number by 5. The percentage error he committed is

A. 95%   B. 96%   C. 50%   D. 75%

14. ABC is an isosceles triangle with sides $AB = AC = 3x - 4 = \frac{3}{4}x + 32$ equilateral triangle with side length x is

A. $32\sqrt{3}$ B. $36\sqrt{3}$ C. $54\sqrt{3}$ D. $64\sqrt{3}$

15. Two distinct numbers a and 6 are selected from 1, 2, 3,..., 60. The maximum value of $\frac{a \times b}{a - b}$

Is

A. 6750   B. 5270   C. 4850   D. 3540

PART – B

Note

• Write the correct answer in the space provided in the response sheet.

• For each correct response you get 1 mark. For each incorrect response you lose $\frac{1}{4}$ mark.

16. Two cogged wheels of which one has 16 cogs and the other 27 cogs, mesh into each other. If the latter turns 80 times in three quarters of a minute, the number of turns made by the other in 8 seconds is ———

17. If n is a positive integer such that $a^{2n} = 2$, then $2a^{6n}$ — 16 is ———

18. The least number of children in a family such that every child has at least one sister and one brother is -———

19. A water tank is $\frac{4}{5}$ full. When 40 liters of water is removed, it becomes $\frac{3}{4}$ full. The capacity of the tank in liters is ———

20. ABC is an equilateral triangle. Squares are described on the sides AB and AC as shown. The value of x is ———
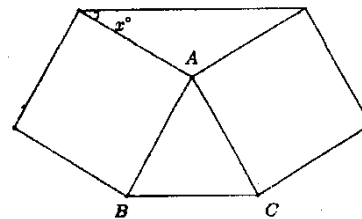
21. ABCD is a trapezium with AB = 6 cm, AD = 8 cm and CD = 18 cms. The sides AB and CD are parallel and AD is perpendicular to AB. P is the point of intersection of AC and BD. The difference between the areas of the triangles PCD and PAB in square cms is ———
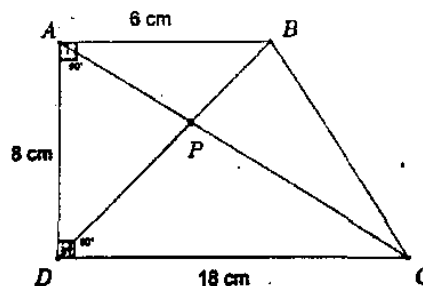
22. The price of cooking oil has increased by 25%. The percentage of reduction that a family should effect in the use of oil so as not to increase the expenditure is ———

23. The number of natural numbers between 99 and 999 which contains exactly one zero is -
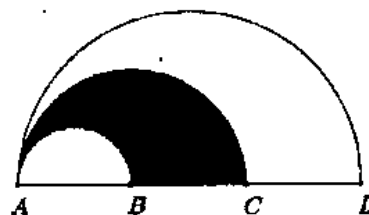
24. In the adjoining figure we have semicircles and *AB - BC = CD.* The ratio of the unshaded area to the shaded area is -

25. Gold is 19 times as heavy as water and copper is 9 times as heavy as water. The ratio in which these two metals be mixed so that the mixture is 15 times as heavy as water is -

26. Five angles of a heptagon (seven sided polygon) are 160°, 135°, 185°, 145° and 125°. If the other two angles are both equal to *x°,* then *x* is -

27. *ABCD* is a trapezium with *AB* parallel to *CD* and *AD* perpendicular to *AB.* If *AB* = 23 cm, *CD* = 35 cm and *AD*= 5 cm. The perimeter of the given trapezium in cms is ————

28. The number of three digit numbers which are multiples of 11 is ————

29. If a,6 are digits, *ab* denotes the number 10a + 6. Similarly, when a,b,*c* are digits, *abc* denotes the number 100o+106+c. If *X, Y, Z* are digits such that *XX+YY+ZZ = XYZ,* then *XX* × *YY* × *ZZ* is ————

30. The positive integer *n* has 2, 5 and 6 as its factors and the positive integer *m* has 4,8,12 as its factors. The smallest value of *m* + *n* is -

***

"Success is in all of us. It just matters who is willing to work for it."

Answer Key

1	C
2	C
3	A
4	B
5	A
6	C
7	A
8	D
9	B
10	A
11	C
12	B
13	B
14	D
15	D
16	24
17	0
18	4
19	800
20	30°
21	48
22	20
23	162
24	2 : 1
25	3 : 2
26	75
27	76
28	81
29	95832
30	54