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MATHEMATICS

1. If the ratio of AB to BC is 4:9, what is the area of Parallelogram ABCD?

a) 36
b) 26
c) 18
d) Cannot be determined

2. When any circle in 2nd Quadrant then what will be the equation of the circle when radius is 5 cm

a) $x^2 + y^2 + 10x + 10y + 25 = 0$
b) $x^2 + y^2 + 10x - 10y + 25 = 0$
c) $x^2 + y^2 - 10x - 10y + 25 = 0$
d) $x^2 + y^2 - 10x + 10y + 25 = 0$

3. If a line contains a point P_1 (3, -3) and P_2 (-3 , 3) then the slope of line is?

a) 2
b) 1
c) -1
d) -2

4. If z = (1,2) then z^{-1} = ?

a) (0.2, 0.4)
b) (-0.2, 0.4)
c) (0.2, -0.4)
d) (-0.2, -0.4)

5. $\bar{\bar{Z}} =$

a) $\bar{Z}$
b) $-Z$
c) Z
d) None

6. The multiplicative inverse of $1 - 2i$ is

a) $\frac{1}{5} + \frac{2}{5i}$
b) $\frac{1}{3i}$
c) $\frac{1}{5} + \frac{2}{5i}$
d) $\frac{1}{5} - \frac{2}{5i}$

7. Which of the following is not monoid w.r.t. addition?

a) Z
b) W
c) N
d) R

8. The middle term is the expansion of $(a + b)^{12}$ is?

a) 13th
b) 12th
c) 11th
d) None

9. If A = {4,3} then P(A) is

a) {φ , {4} , {3} , {4,3}}
b) { {3}, {4} , {4, 3} }
c) {φ, {3} , {4} }
d) {φ, {3,4} }

10. The set (Q , +)

a) Forms a group
b) Does not form a group
c) Contains not additive identity
d) Contain no additive inverse

11. The expansion of $(1 - 3x)^{\frac{2}{3}}$ is valid?

a) $|x| < \frac{1}{3}$
b) $|x| < \frac{1}{2}$
c) $|x| < \frac{2}{3}$
d) $|x| < 1$

12. If $\#n = (n - 5)^2 + 5$ then find $\#3 \times \#4$ =?

a) 54
b) 12
c) 4
d) 9

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13. Power set of X P(X)…….. Under the binary operation of union U

a) Forms a group
b) Does not form a group
c) Has no identity
d) ∞ Set although X is ∞

14. If A is non-singular matrix then $(A^{-1})^{-1}$=?

a) A
b) –A
c) 1
d) None

15. Out of 800 boys in a school, 334 played cricket, 240 played hockey and 336 played basketball of the total 64 played both basketball and hockey 80 played cricket and basketball and 40 played cricket and hockey 24 played all the games the number of boys who did not play any game is?

a) 40
b) 56
c) 24
d) 50

16. Let the equation $ax^2 - bx + c = 0$ have district real roots both lying in the open interval (0, 1) where a, b, c are given to be positive integers then the value of the ordered triplet (a, b, c) can be?

a) (5, 3, 1)
b) (4, 3, 2)
c) (5, 5, 1)
d) (6, 4, 1)

17. If A and B are disjoint sets, then A∩B is

a) A
b) B
c) Null set
d) A U B

18. {1, -1. i, -i} is a group closed under

a) Multiplication
b) Addition
c) Division
d) Both A & C

19. If ω is complex cube root of unity then $\omega^{14} + \omega^{16}$ is

a) 1
b) 0
c) ω
d) -1

20. One root of $2x^2+kx+16 = 0$ is 4 the other root is

a) 2
b) 3
c) 4
d) Cannot be found

21. If $A = A^t$ then matrix A is

a) Symmetric
b) Screw Symmetric
c) Square
d) None of these

22. The next term of the following sequence is $\frac{1.1}{7}, \frac{-3.3}{7}, \frac{9.9}{7}$ _____

a) $\frac{-9.9}{7}$
b) $\frac{-11.11}{7}$
c) $\frac{29.7}{7}$
d) $\frac{-29.7}{7}$

23. The nth term of the following sequence is 0, 6, 24, 60……..

a) $n^2 - n$
b) $n^2 - 2n$
c) $n^3 - 2n$
d) $n^3 - n$

24. If the sum of n terms is n^2-3n then its 6^{th} term is

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a) 6 c) 10

b) 8 d) 12

25. Three arithmetic means between 15 and 7 are

a) 13,10,4 c) 13,11,9

b) 13,9,11 d) 13,10,8

26. If the sum of n natural numbers is 325 then n is

a) 20 c) 15

b) 30 d) 25

27. The product of (2, 3) and (-2,-3) is

a) (5, 12) c) (-5, -12)

b) (5, -12) d) (-5, 12)

28. A coin is tossed twice. The probability of getting at least one head is

a) $\frac{1}{2}$ c) $\frac{1}{4}$

b) $\frac{3}{4}$ d) 1

29. In the expansion of $\left(\frac{x-1}{x}\right)^{10}$, the term independent of x is the r^{th} term. Find r?

a) 6 c) 7

b) 5 d) 8

30. How many different words can be formed using three letters of the word "TABLE"?

a) 15 c) 60

b) 50 d) 120

31. The equation $2x^2+3y^2-4x = 0$ represents

a) A point c) Parabola

b) ellipse d) circle

32. The length of latus rectum of the parabola $y^2 + 12x = 0$ is

a) 12 c) 3

b) -12 d) -3

33. Distance of point (3. -2) from the line $3x + 4y +10 = 0$ is

a) $\frac{11}{5}$ c) $\frac{11}{17}$

b) 10 d) 2

34. The limit of $\frac{e^{3x}-1}{x}$ as x tends to zero is

a) 0 c) 2

b) 3 d) 1

35. Second derivative of e^{2x+1} at x = 1 is

a) e^3 c) $4e^3$

b) $2e^3$ d) $5e^3$

36. The derivative of $secx^2$ w.r.t 'x' is

a) sec^2x b) $secx^2 tanx^2$

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c) $2x \sec x^2 \tan x^2$ d) $2 \sec x \tan x$

37. The derivative of $\frac{x^2+1}{x}$ w.r.t 'x' is

a) 2 c) $1-\frac{1}{x}$

b) $1+\frac{1}{x}$ d) $1-\frac{1}{x^2}$

38. For the curve $y = 2x - x^2$, x=1 is a point of

a) Minima c) Inflexion

b) Maxima d) None

39. If A = {4,5,6,7,8,9,10}, B = {1,2,3,4,5,6} then A-B =?

a) {7,8,9,10} c) {1,2,3,5}

b) {4,5,6,7} d) {1,2,3}

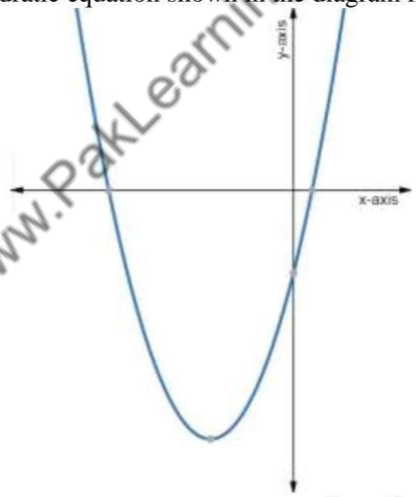
40. $\int \sin x \, e^{\cos x} \, dx =$

a) $e^{\sin x} + C$ d) $e^{-\sin x} + C$

b) $e^{\cos x} + C$

c) $-e^{\cos x} + C$

41. The nature of roots of the quadratic equation shown in the diagram is /can



A. real and equal. C. not be determined.
B. real and different. D. complex and imaginary.

42. The number of real roots of the curve in the given diagram is/are

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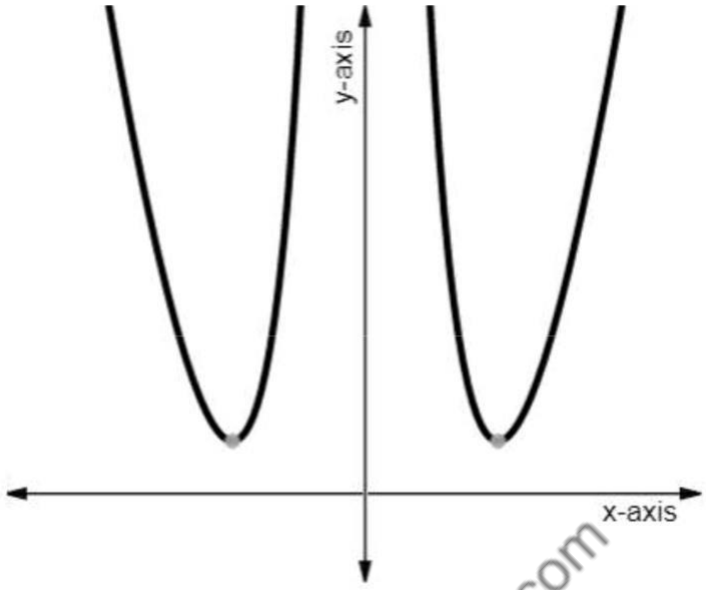

A. 0
B. 1
C. 2
D. 4

43. The value of k so that difference between the roots of $5x^2 - kx + 1 = 0$ is unity, is
A. $2\sqrt{2}$
B. $4\sqrt{2}$
C. $3\sqrt{5}$
D. $7\sqrt{7}$

44. The nature of the roots of the quadratic equation $x^2 - 2\cot\theta\, x - 1 = 0$ are
(**Note**: $\theta \neq n\pi, n \in Z$)
A. real and equal
B. complex and equal
C. real and irrational
D. real and rational

45. If a, b, c are odd integers then the quadratic equation $ax^2 + bx + c = 0$
A. cannot have rational roots
B. cannot have irrational roots
C. have equal roots only
D. have complex roots only

46. If $2 + i\sqrt{3}$ is a root of the equation $x^2 + px + q = 0$, where p and q are real numbers then (p, q) is
A. $(-4,7)$
B. $(4,-7)$
C. $(-4,-7)$
D. $(4,7)$

47. If one root of a quadratic equation $x^2 + bx + c = 0$ is $(2 + i + a)$ then other root is
A. $-b + 2 + i + a$
B. $b - 2 - i - a$
C. $b - 2 - i - a$
D. $-b - 2 - i - a$

48. $\sin\left(-248\frac{\pi}{2}\right)$ is equal to
A. -1
B. 0
C. 1
D. ∞

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49. The value of $\frac{3\sin\theta+5\cos\phi}{3\sin\theta-5\cos\phi}$, when value of $\sin\theta = \frac{1}{\sqrt{2}}$ and $\sin\phi = \frac{1}{3}$

A. $\frac{29}{11}$
B. $-\frac{29}{11}$
C. $\frac{11}{29}$
D. $-\frac{11}{29}$

50. If $\tan\alpha = \frac{1}{\sqrt{3}}$ and $\sin\beta = \frac{1}{2}$, then $\tan(\alpha+\beta)$ is equal to

A. -1
B. 1
C. 2
D. $\sqrt{3}$

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BASIC MATH

1. The market value of a certain machine decreased by 30 percent of its purchase price each year. If the machine was purchased in 1982 for its market value of $8,000, what was its market value two years later?
   (A) $8,000
   (B) $5,600
   (C) $3,200
   (D) $2,400
   (E) $800

2. What percent of 50 is 15?
   (A) 30%
   (B) 35%
   (C) 70%
   (D) 300%
   (E) $333\frac{1}{3}\%$

3. In a certain diving competition, 5 judges score each dive on a scale from 1 to 10. The point value of the dive is obtained by dropping the highest score and the lowest score and multiplying the sum of the remaining scores by the degree of difficulty. If a dive with a degree of difficulty of 3.2 received scores of 7.5, 8.0, 9.0, 6.0, and 8.5, what was the point value of the dive?
   (A) 68.8
   (B) 73.6
   (C) 75.2
   (D) 76.8
   (E) 81.6

4. If $2x = 3y = 10$, then $12xy =$
   (A) 1,200
   (B) 200
   (C) 120
   (D) 40
   (E) 20

5. If Jack walked 5 miles in 1 hour and 15 minutes, what was his rate of walking in miles per hour?
   (A) 4
   (B) 4.5
   (C) 6
   (D) 6.25
   (E) 15

6. Of a certain high school graduating class, 75 percent of the students continued their formal education, and 80 percent of those who continued their formal education went to four-year colleges. If 300 students in the class went to four-year colleges, how many students were in the graduating class?
   (A) 500
   (B) 375
   (C) 240
   (D) 225
   (E) 180

7. What is the least integer greater than –2+0.5?
   (A) –2
   (B) –1
   (C) 0
   (D) 1
   (E) 2

8. Which of the following is equivalent to $\frac{2x+4}{2x^2+8x+8}$ for all values of x for which both expressions are defined?
   (A) $\frac{1}{2x^2+6}$
   (B) $\frac{1}{9x+2}$
   (C) $\frac{2}{x+6}$
   (D) $\frac{1}{x+4}$
   (E) $\frac{1}{x+2}$

9. A certain business printer can print 40 characters per second, which is 4 times as fast as an average printer. If an average printer can print 5 times as fast as an electric typewriter, how many characters per minute can an electric typewriter print?

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(A) 2
(B) 32
(C) 50
(D) 120
(E) 600

10. When ticket sales began, Pat was the nth customer in line for a ticket, and customers purchased their tickets at the rate of x customers per minute. Of the following, which best approximates the time, in minutes, that Pat had to wait in line from the moment ticket sales began?

(A) $(n - 1)\,x$
(B) $n + x - 1$
(C) $\frac{n-1}{x}$
(D) $\frac{x}{n-1}$
(E) $\frac{n}{x-1}$

11. If 6 gallons of gasoline are added to a tank that is already filled to $\frac{3}{4}$ of its capacity, the tank is then filled to $\frac{9}{10}$ of its capacity. How many gallons does the tank hold?

(A) 20
(B) 24
(C) 36
(D) 40
(E) 60

12. A bus trip of 450 miles would have taken 1 hour less if the average speed S for the trip had been greater by 5 miles per hour. What was the average speed S, in miles per hour, for the trip?

(A) 10
(B) 40
(C) 45
(D) 50
(E) 55

13. 10^3 is how many times $(0.01)^3$?

(A) 10^6
(B) 10^8
(C) 10^9
(D) 10^{12}
(E) 10^{18}

14. Which of the following groups of numbers could be the lengths of the sides of a right triangle?

I . 1, 4, $\sqrt{17}$
II . 4, 7, $\sqrt{11}$
III . 4, 9, 6

(A) I only
(B) I and II only
(C) I and III only
(D) II and III only
(E) I , II , and III

15. When the stock market opened yesterday, the price of a share of stock $X$was $10\frac{1}{2}$. When the market closed, the price was $11\frac{1}{4}$. Of the following, which is closest to the percent increase in the price of stock X?

(A) 0.5%
(B) 1.0%
(C) 6.7%
(D) 7.1%
(E) 7.5%

16. If x and y are integers and xy^2 is a positive odd integer, which of the following must be true?

I . xy is positive.
II . xy is odd.
III . $x + y$ is even.

(A) I only
(B) II only
(C) III only
(D) I and II
(E) II and III

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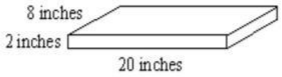

17. The figure above shows the dimensions of a rectangular box that is to be completely wrapped with paper. If a single sheet of paper is to be used without patching, then the dimensions of the paper could be
(
A) 17 in by 25 in
(B) 21 in by 24 in
(C) 24 in by 12 in
(D) 24 in by 14 in
(E) 26 in by 14 in

18. $$x - y = 3$$
$$2x = 2y + 6$$

The system of equations above has how many solutions?
(A) None
(B) Exactly one
(C) Exactly two
(D) Exactly three
(E) Infinitely many

19. If M and N are positive integers that have remainders of 1 and 3, respectively, when divided by 6, which of the following could NOT be a possible value of $M+N$?
(A) 86
(B) 52
(C) 34
(D) 28
(E) 10

20. The R students in a class agree to contribute equally to buy their teacher a birthday present that costs y dollars. If x of the students later fail to contribute their share, which of the following represents the additional number of dollars that each of the remaining students must contribute in order to pay for the present?

(A) $\frac{y}{R}$
(B) $\frac{y}{R-x}$
(C) $\frac{xy}{R-x}$
(D) $\frac{xy}{R(R-x)}$
(E) $\frac{y}{R(R-x)}$

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IQ

QUESTION 1

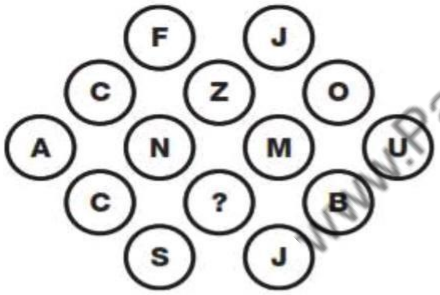
Which number replaces the question mark an completes the puzzle?

1	7	9
3	6	3
5	4	2
2	7	5
2	6	?

7, 3, 5, 6,

QUESTION 2

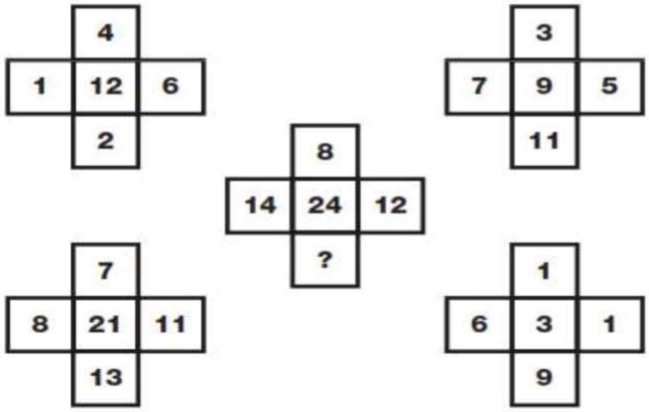
Which letter replaces the question mark and completes the puzzle?



B, A, D, E

QUESTION 3

Which number replaces the question mark and completes the puzzle?



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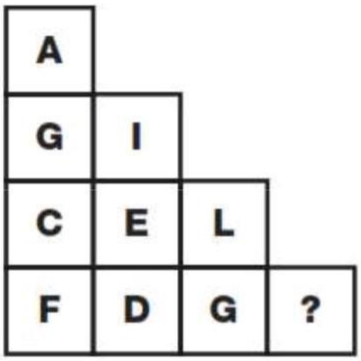
11, 10, 22, 44

QUESTION 4

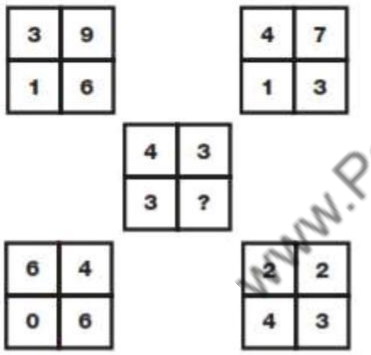
Which letter replaces the question mark and completes the puzzle?



S, R, T, Q

QUESTION 5

Which number replaces the question mark and completes the puzzle?



1, 2, 3, 5

QUESTION 6

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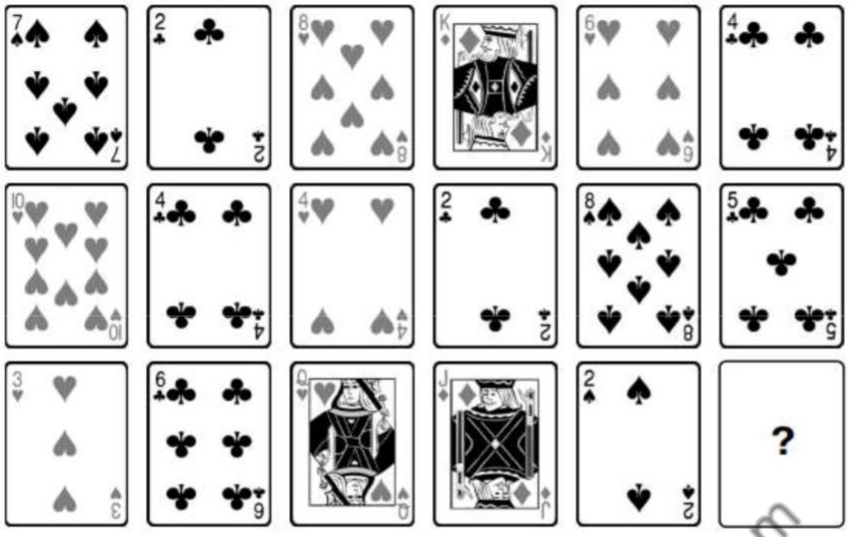
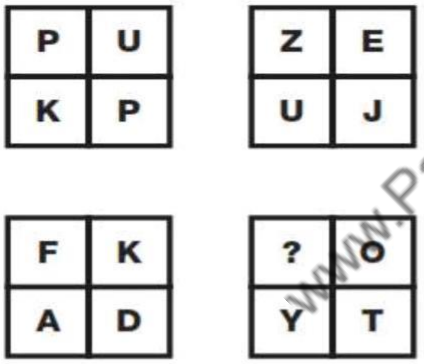
Which playing card replaces the question mark and completes the puzzle?



2 LEAF, 3 CUBE, 2 LOVE ,2 CUBE

QUESTION 7

Which letter replaces the question mark and completes the sequence?



X, N, Z, Q

QUESTION 8

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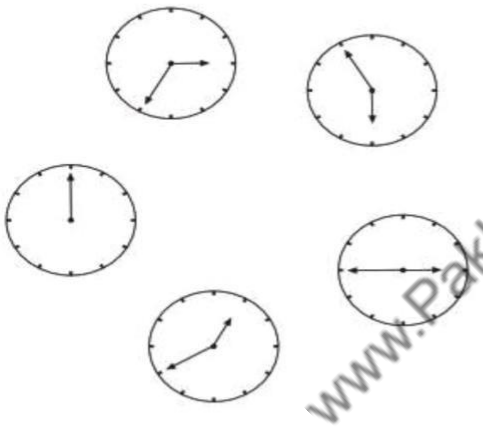
Which letter replaces the question mark and completes the puzzle?

D		F		I	
	X		R		M
E		M		O	
	A		V		R
G		N		V	
	E		A		?

X, B, N, J

QUESTION 9

Where should the missing hour hand point?



A. TO THE 4
B. TO THE 6
C. TO THE 9
D. TO THE 1

QUESTION 10

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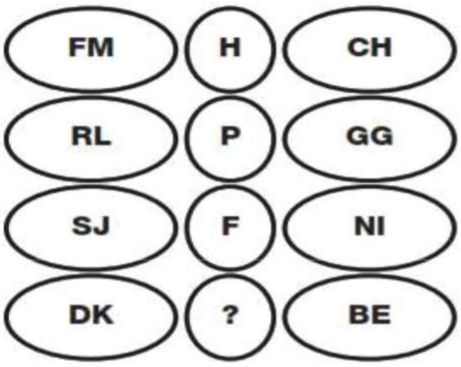
Which letter replaces the question mark and completes the puzzle?



H, M, B, V

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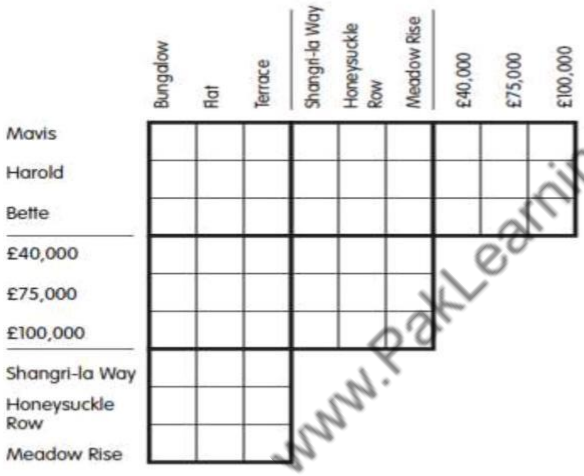
QUESTION 11



Mavis, Harold and Bette all own properties in rather exclusive areas of the town, and have recently had them valued. Harold lives in Meadow Rise, but his property is not worth £75,000. The property in Honeysuckle Row worked out as the cheapest, despite it being a lovely road. Bette lives in a terrace house, although there are no terraced houses along Shangri-La Way. Mavis's property is not a bungalow. Can you deduce from these clues which person lives where, in which property, and how much the property was valued.

Owner	Property	Road	Value

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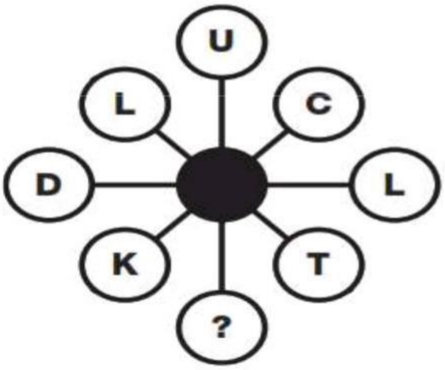
QUESTION 12

Which letter replaces the question mark and completes the puzzle?



A, N, C, G

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QUESTION 13

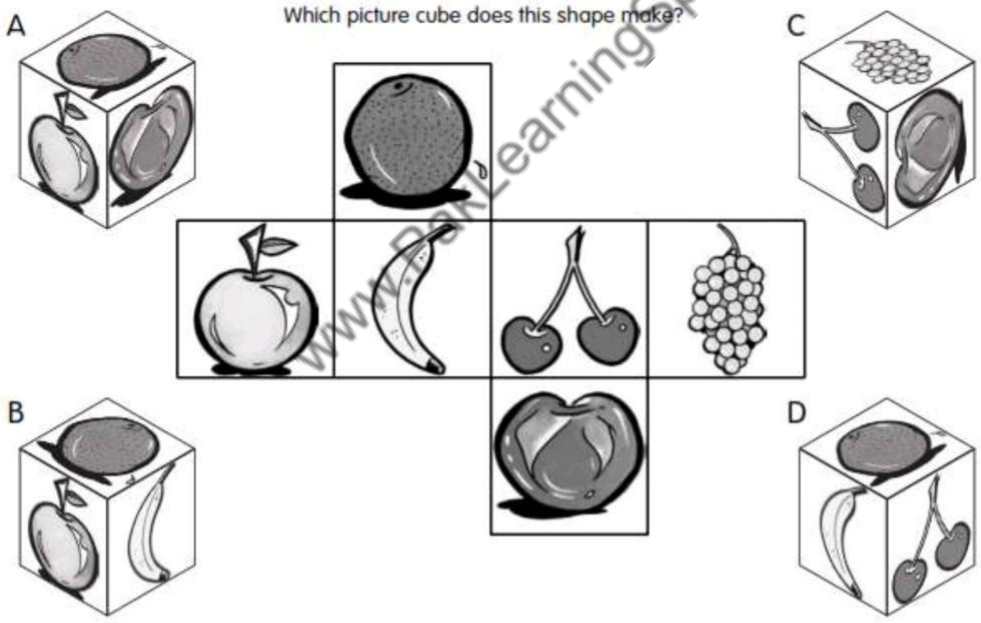
Which number replaces the question mark and completes the puzzle?

6	EJI	3
M F K		D P G
9	NRG	?

12, 4, 14, 9

QUESTION 14

Which picture cube does this shape make?



Y, M, E, C

QUESTION 15

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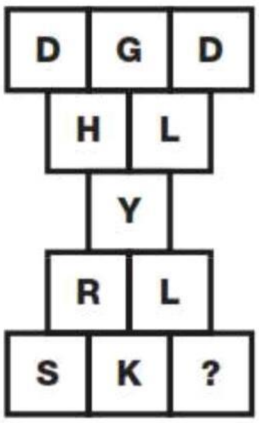
Which letter replaces the question mark and completes the puzzle?



E, M, N, .B

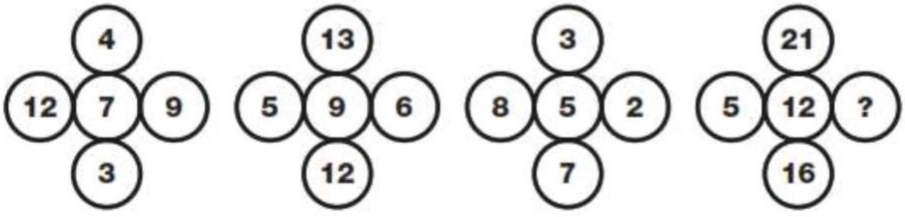
QUESTION 16

Joe and John are playing marbles. If Joe loses one marble to John, they will both have the same number of marbles, but if John loses one marble to Joe, Joe will have twice the number of marbles as John. How many marbles do the two boys currently have?

A. JOE HAS 7 JOHN HAS 5
B. JOE HAS 5 JOHN HAS 7
C. JOE HAS 3 JOHN HAS 6

QUESTION 17

Which number replaces the question mark and completes the puzzle?



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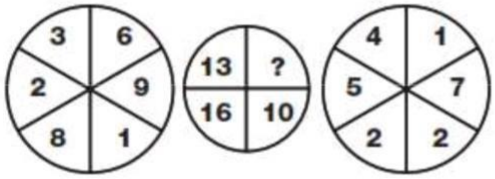
6, 7, 10, 11

QUESTION 18:

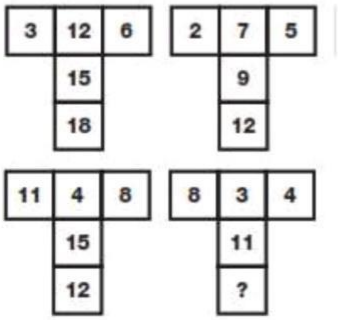
Which number replaces the question mark and completes the puzzle?



12, 11, 10, 9

QUESTION 19:

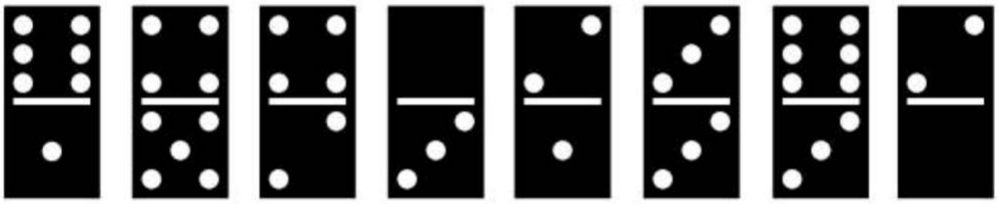
Which number replaces the question mark and completes the puzzle?



2, 4, 7, 5

QUESTION 20:

Which domino replaces the question mark to complete the puzzle?



5, 7, 4, 9

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ENGLISH

ANALOGIES

1. CLOCK : MINUTE
A. ruler: centimetre B. sundial : shadow
C. arc : ellipse D. product : shelf life
E. quart : capacity

2. LAWYER : CLIENT
A. doctor : surgeon B. admiral : sailor
C. judge : defendant D. museum : audience
E. tutor : student

SYNONYMS

3. Synonym of FIASCO

A. disappointment B. turning point C. complete failure
D. celebration E. funfair

4. Synonym of STIPEND
A. increment B. salary C. commission
D. gift E. perquisite

ANTONYMS

5. Antonym of ILLUMINATE
A. precipitate B. hallow C. obfuscate
D. defer E. refine.

6. Antonym of ACUTE
A. rotund B. pervasive C. chronic
D. jaundiced E. resilient

SENTENCE COMPLETION

7. There were many cars in the theatre parking lot. When Darren found an available parking spot, he felt _____.
A. vulnerable B. ecstatic C. fortunate
D. uncommon E. believed

8. Samuel's employees were quite _____: they learned quickly and were able to do most of the tasks he _____.
A. decisive...wanted B. able...listed C. humble...assigned
D. capable...requested E. disturbed...ordered

PREPOSITIONS

9. No government is hostile _____ social reforms.
A. at B. in C. for D. to E. as

10. We trust _____ God.
A. at B. on C. in D. to E. before

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SECTION - I MATHEMATICS				SECTION - III BASIC MATH		SECTION - IV IQ		SECTION - V ENGLISH	
1	D	41	B	1	C	1	7	1	A
2	B	42	A	2	A	2	A	2	E
3	C	43	C	3	D	3	22	3	C
4	C	44	D	4	B	4	T	4	B
5	C	45	A	5	A	5	2	5	C
6	A	46	A	6	A	6	9 CUBE	6	C
7	C	47	D	7	B	7	Z	7	B
8	D	48	B	8	E	8	X	8	D
9	A	49	B	9	D	9	A	9	D
10	A	50	D	10	C	10	H	10	
11	A			11	D	11	Owner / Property / Road / Value Mavis / Flat / Shangri-La Way / £75,000 Harold / Bungalow / Meadow Rise / £100,000 Bette / Terrace / Honeysuckle Row / £40,000		
12	A			12	C	12	C		
13	B			13	C	13	12		
14	A			14	A	14	E		
15	D			15	D	15	E		
16	C			16	E	16	A		
17	C			17	B	17	6		
18	D			18	E	18	11		
19	D			19	A	19	7		
20	A			20	D	20	5		
21	A								
22	D								
23	D								
24	B								
25	C								
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34	B								
35	C								
36	C								
37	D								
38	B								
39	A								
40	C								

W		W		W		W		W	
R		R		R		R		R	

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