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MATHEMATICS

1. Find $(A - B) \cap B$ when $A = \{a, e, i, o, u\}$ and $B = \{a, b, c, d\}$
 - a. \emptyset
 - b. A
 - c. B
 - d. $A - B$

2. Find the value of ' λ ' if both the vectors if $a = 2i - j - 2k$, $b = 3i - 2\lambda j$ are perpendicular to each other
 - a. -3
 - b. -6
 - c. 6
 - d. 3

3. When there are 10 balls of different colours. In how many ways you can choose 7 balls of different colours black and white balls are excluded?
 - a. 8
 - b. 10
 - c. 12
 - d. 60

4. When $\cos\theta \sin\theta = 0.22$ then $(\cos\theta - \sin\theta)^2 =$
 - a. $\frac{1}{2}$
 - b. 0.56
 - c. 0.44
 - d. 0.0484

5. Find the point dividing $(1, 2)$ & $(7, -4)$ in the ratios 1: 2
 - a. $(0, -3)$
 - b. $(0, 3)$
 - c. $(-3, 0)$
 - d. $(3, 0)$

6. Find the geometric progression when $a = 4$ & $r = \frac{1}{3}$
 - a. $4, \frac{4}{3}, \frac{4}{9}, \frac{4}{27}, \dots$
 - b. $4, \frac{16}{3}, \frac{64}{9}, \frac{256}{27}, \dots$
 - c. $1, 4, \frac{16}{3}, \frac{64}{9}, \frac{256}{27}, \dots$
 - d. None

7. Find the derivative of $7x^6 + 6x^5 + 5x^4$
 - a. $7x^5 + 6x^4 + 5x^3$
 - b. $13x^6 + 11x^5 + 9x^4$
 - c. $42x^5 + 30x^4 + 20x^3$
 - d. $6x^5 + 5x^4 + 4x^3$

8. Find the fifth derivative of $f(x) = e^{ab}$
 - a. e^{ab}
 - b. 0
 - c. $(ab)^5 e^{ab}$
 - d. 1

9. What is the value of 'x' if $\begin{bmatrix} 2 & 4 \\ 4 & x \end{bmatrix}$ is singular matrix?
 - a. 0
 - b. 2
 - c. 6
 - d. 8

10. $A = \begin{bmatrix} 2 & 4 \\ 4 & 2 \end{bmatrix}$ is a
 - a. Singleton
 - b. Singular
 - c. Non-singular
 - d. Null

11. $2\sin 45^\circ \cos 45^\circ = ?$
 - a. $\sqrt{2}$
 - b. $\frac{\sqrt{3}}{2}$
 - c. 1
 - d. $\frac{1}{\sqrt{2}}$

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12. $r^2 = g^2 + f^2 - c$ represents:
- a. Circle
 - b. Point circle
 - c. None
 - d. Ellipse
13. If $a = x + y$ and $b = x - y$ then the value of $ab = ?$
- a. $x^2 - y^2$
 - b. $x^2 + y^2$
 - c. xy
 - d. $x^2 + y^2 - 2xy$
14. What is the probability of getting a red card from an ordinary deck of cards?
- a. $\frac{1}{52}$
 - b. $\frac{1}{26}$
 - c. $\frac{1}{2}$
 - d. $\frac{1}{9}$
15. If a curve is given by $x^2 - \frac{y^2}{5} = 1$, find the coordinates of foci
- a. $(\pm\sqrt{3}, 0)$
 - b. $(\pm\sqrt{5}, 0)$
 - c. $(\pm 1, 0)$
 - d. $(\pm\sqrt{6}, 0)$
16. $\int \frac{\cos x}{\sqrt{\sin x}} dx = ?$
- a. $\sqrt{\sin x} + c$
 - b. $2\sqrt{\sin x} + c$
 - c. $\frac{1}{2\sqrt{\sin x}} + c$
 - d. $\frac{1}{2}\sqrt{\sin x} + c$
17. $\frac{d}{dx} e^{x^3} = ?$
- a. e^{x^3}
 - b. $3x^2 e^{x^3}$
 - c. $3x^2 e^{x^2}$
 - d. $x^2 e^{x^3}$
18. Find the sum of first 'n' odd integers:
- a. n^2
 - b. $(2sn + 1)$
 - c. $\frac{(2n+1)}{2}$
 - d. $\frac{n(n+1)}{2}$
19. Evaluate:
$$\begin{vmatrix} xyz^2 & x^2yz & xy^2z \\ x & y & z \\ y & z & x \\ z & x & y \end{vmatrix}$$
- a. 0
 - b. 1
 - c. $x^2y^2z^2(x^2 - y^2)(z^2 - x^2)(y^2 - z^2)$
 - d. $x^2y^2 + y^2z^2 + z^2x^2 - x^4 - y^4 - z^4$
20. How many tangents can be drawn to circle if a point lies outside the circle?
- a. 1
 - b. 2
 - c. 0
 - d. None
21. $\sin 15^\circ = ?$
- a. $\frac{\sqrt{6}-\sqrt{2}}{4}$
 - b. $\frac{\sqrt{6}+\sqrt{2}}{4}$
 - c. $\frac{-\sqrt{6}-\sqrt{2}}{4}$
 - d. $\frac{-\sqrt{6}+\sqrt{2}}{4}$
22. $\int x^2 e^x dx = ?$

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- a. $e^x(x^2 - 2x + 2) + c$
 b. $e^x(2x^2 - 1) + c$
23. If the focus of parabola is $(0, -3)$ then it is:
 a. Cup up parabola
 b. Cup down parabola
24. $\frac{1}{1-\sin^2\theta} + \frac{1}{1+\sin^2\theta} = ?$
 a. $\frac{1}{1+\sin^2\theta}$
 b. $\frac{2}{1-\sin^2\theta}$
25. $\frac{d}{dx} \tan^2 x = ?$
 a. $2\tan x \sec^2 x$
 b. $\sec^2 x$
26. $\int_0^{ln e^2} x^2 e^{3x^3} dx = ?$
 a. $\frac{1}{9}(e^{24} - 1)$
 b. $9e^{3x^2}$
27. Find the distance between $(2, -6)$ and $(6, -3)$
 a. 25
 b. 4
28. Slope of line $\frac{5x}{2} + \frac{7y}{2} = \frac{49}{10}$ is:
 a. 6
 b. $-\frac{5}{7}$
29. Standard equation of hyperbola if centre is at $(0,0)$:
 a. $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
 b. $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
30. Find the equation of tangent to the curve $3x^2 - 4y^2 = 12$ at $(4, -3)$:
 a. $x + y = 1$
 b. $x - y = -1$
31. $\frac{d}{dx} [f(x), g(x)]^2 = ?$
 a. $[f(x), g(x)]^2$
 b. $2[f(x), g(x)] \left[f(x) \cdot \frac{d}{dx} g(x) + g(x) \cdot \frac{d}{dx} f(x) \right]$
32. If $z = -7 + \sqrt{3}i$ then find $(z - \bar{z})^3$
 a. 343
 b. -343
33. If $f(x) = x^3 + \cos x$ then $f(x)$ is?
 a. An odd function
 b. A even function
- c. $e^x(2x + 1) + c$
 d. $2xe^x x^2 + c$
- c. Left open parabola
 d. Right open parabola
- c. $\frac{2}{1-\sin^4\theta}$
 d. $\frac{1}{1+\tan^2\theta}$
- c. $\tan x \sec^2 x$
 d. $2\tan^2 x \sec^2 x$
- c. $\frac{1}{9}(e^{41} - 2)$
 d. e^{3x^2}
- c. 5
 d. 16
- c. $\frac{7}{5}$
 d. 11
- c. $\frac{x^2}{a^2} + y^2 = 1$
 d. $\frac{x^2}{a^2} - y^2 = 1$
- c. $x + y = -1$
 d. $x - y = 1$
- c. $[f(x), g(x)]^{-1}$
 d. $\left[f(x) \cdot \frac{d}{dx} g(x) + g(x) \cdot \frac{d}{dx} f(x) \right]$
- c. $-12\sqrt{3}i$
 d. $-24\sqrt{3}i$
- c. Neither odd nor even
 d. A constant function

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34. $\lim_{x \rightarrow 3} \frac{3x^2 - 7x - 6}{x^2 - 8x + 15} =$
- 0
 - $\frac{11}{15}$
 - ∞
 - $-\frac{11}{2}$
35. Find $f'(x)$, if $f(x) = \sin^3 x$
- $3 \sin^2 x \cos x$
 - $3 \sin^2 x \cos^2 x$
 - $3 \sin x \cos x$
 - $\frac{1}{2} \sin^2 x \cos^2 x$
36. If $dy = \ln x \, dx$ and the slope at (x, y) is same as when it is parallel to x axis find x ?
- 0
 - 1
 - e
 - $\frac{1}{e}$
37. The derivative of $\cos^2 3x$
- $-6 \cos 3x \sin x$
 - $6 \cos 3x \sin x$
 - $-2 \cos 3x \sin x$
 - None
38. Curve $y = x^2 - 8$ has:
- | | | |
|------------------|-------------------|-----------------------|
| I. Maximum value | II. Minimum value | III. No extreme value |
| a. I only | c. I and II only | d. III only |
| b. II only | | |
39. The equation of the line which is parallel to x axis and 5 units above it is?
- $y = 5$
 - $y = -5$
 - $x = -5$
 - $x = 5$
40. The derivative of the function $y = \cos x$ is equal to?
- $\sin x$
 - $-\tan x$
 - $-\sin x$
 - $\cos x$
41. If α, β are the roots of $x^2 - 2x + 1 = 0$, then $(\alpha + \beta)^2$ is equal to
- | | |
|-------|------|
| A. -2 | C. 2 |
| B. 1 | D. 4 |
42. The possible number of root(s) of the equation $x^{\frac{2}{3}} = 9$ is/are
- one.
 - two.
 - no roots.
 - infinite many roots.
43. The real quadratic equation whose coefficients are rational and whose one root is $\sqrt{2} + \sqrt{9}$, is
- | | |
|------------------------|-------------------------|
| A. $x^2 - 7x - 11 = 0$ | C. $-x^2 + 2x - 1 = 0$ |
| B. $x^2 - 6x + 7 = 0$ | D. $x^2 - 13x - 15 = 0$ |
44. ω being the complex cube roots of unity then consider the following statements
- | | |
|---|--------------|
| I. $\omega^2 = \frac{1}{\omega}$ | C. I and II |
| II. $\omega^{3n} = \frac{1}{\omega}; n \in \text{integer}$ | D. I and III |
| III. $\omega^n + \omega^{n+1} + \omega^{n+2} = 0; n \in \text{integer}$ | |
- I only
 - II only

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45. If one root of $5x^2 + 7abdx - t^2 + 196 = 0$ is zero then t is equal to
 A. -14
 B. 0
 C. ± 14
 D. -14
46. $\frac{x+1}{x(x+2)^2} =$
 A. $\frac{A}{x} + \frac{B}{x+2}$
 B. $\frac{A}{x} + \frac{B}{x+2} + \frac{C}{(x+2)^2}$
 C. $\frac{A}{x} + \frac{B}{x+2} + \frac{Cx+D}{(x+2)^2}$
 D. $\frac{A}{x} + \frac{Bx+C}{(x+2)^2}$
47. $\sqrt{x+2} = -1$ then real root(s) of the equation is/are
 A. one
 B. two
 C. three
 D. no roots
48. If α, β are the roots of $3x^2 + 2x + 5 = 0$ then sum of $\frac{\alpha+1}{\alpha}$ and $\frac{\beta+1}{\beta}$ is equal to
 A. $-\frac{8}{9}$
 B. $\frac{8}{5}$
 C. $-\frac{2}{3}$
 D. $\frac{5}{3}$
49. If the equation $7x^2 + 15x + k = 0$ has roots $\sqrt{\alpha}$ and $\frac{1}{\sqrt{\alpha}}$, then k is equals to
 A. -11
 B. 2
 C. 7
 D. 15
50. If the sum of a number and its reciprocal is $\frac{41}{20}$, then the number is
 A. $\frac{5}{4}$
 B. $-\frac{5}{4}$
 C. $-\frac{4}{5}$
 D. $\frac{1}{5}$

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BASIC MATH

1. The 180 students in a group are to be seated in rows so that there is equal number of students in each row. Each of the following could be the number of rows EXCEPT

(A) 4	(D) 40
(B) 20	(E) 90
(C) 30	

2. A parking garage rents parking spaces for \$10 per week or \$30 per month. How much does a person save in a year by renting by the month rather than by the week?

(A) \$140	(D) \$240
(B) \$160	(E) \$260
(C) \$220	

3. If $y = 5x^2 - 2x$ and $x = 3$, then $y =$

(A) 24	(D) 51
(B) 27	(E) 219
(C) 39	

4. Of the following, which is the best approximation to $\sqrt{0.0026}$?

(A) 0.05	(D) 0.5
(B) 0.06	(E) 0.6
(C) 0.16	

5. At a certain diner, a hamburger and coleslaw cost \$3.59, and a hamburger and french fries cost \$4.40. If french fries cost twice as much as coleslaw, how much do french fries cost?

(A) \$0.30	(C) \$0.60
(B) \$0.45	(D) \$0.75
(E) \$0.90	

6. If $\angle XYZ$ in the figure above is a right angle, what is the value of x ?

(A) 155	(D) 125
(B) 145	(E) 110
(C) 135	



7. In the expression above, a , b , and c are different numbers and each is one of the numbers 2, 3, or 5. What is the least possible value of the expression?

(A) $\frac{1}{30}$	(C) $\frac{1}{6}$
(B) $\frac{2}{15}$	(D) $\frac{3}{10}$
(E) $\frac{5}{6}$	

8. A certain culture of bacteria quadruples every hour. If a container with these bacteria was half full at 10:00 a.m., at what time was it one-eighth full?

(A) 9:00 a.m.	(C) 6:00 a.m.
(B) 7:00 a.m.	(D) 4:00 a.m.
(E) 2:00 p.m.	

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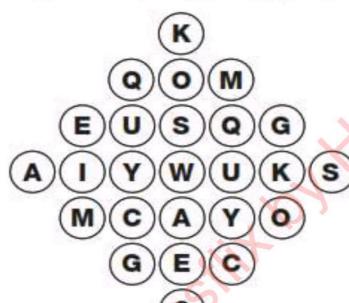
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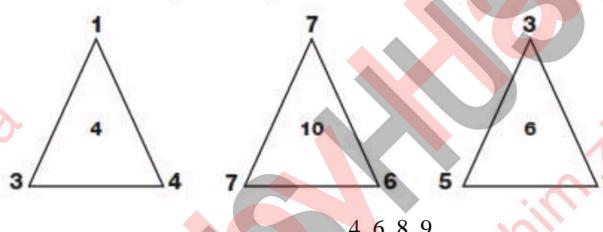
IQ

QUESTION 1

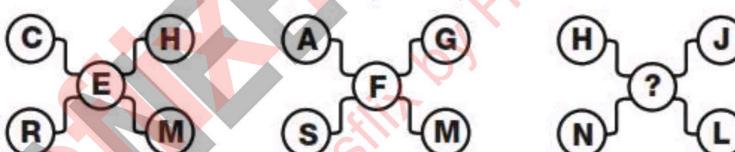
Which of the lower circles replaces the question mark?


QUESTION 2

Which number replaces the question mark and completes the puzzle?


QUESTION 3

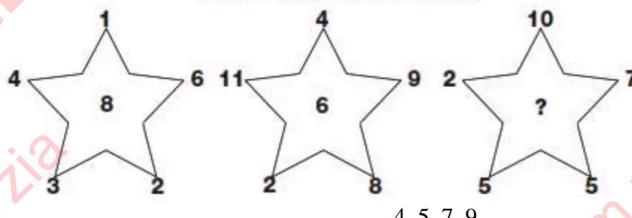
Which letter completes the puzzle?



A, B, E, F

QUESTION 4

What is missing from the last star?


QUESTION 5

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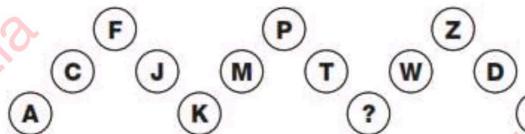
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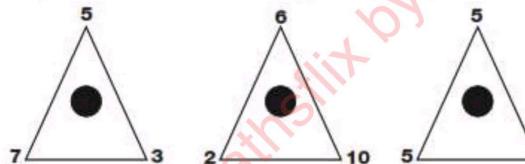
Which letter completes the puzzle?



QUESTION 6

A, U, V, W

Which number replaces the question mark and completes the puzzle?



QUESTION 7

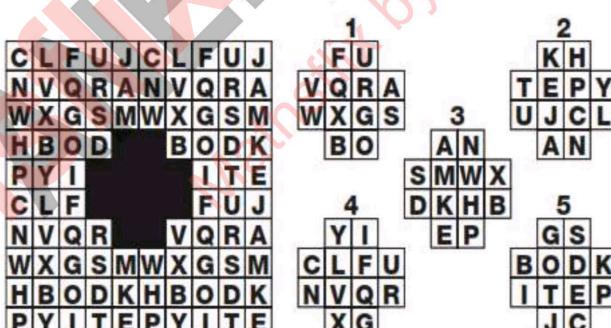
5, 6, 4, 3

Which number replaces the question mark and completes the puzzle?



QUESTION 8

Which segment completes the puzzle?



QUESTION 9

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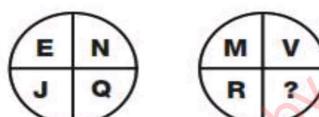
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Which letter replaces the question mark and completes the puzzle?



A, Y, Z, Q

QUESTION 10

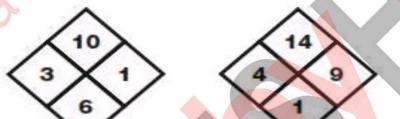
Which letter follows the sequence to complete the puzzle?



X, V, W, Q

QUESTION 11

Which number replaces the question mark and completes the sequence?



QUESTION 12

4, 8, 11, 10

Which number replaces the question mark and completes the sequence?



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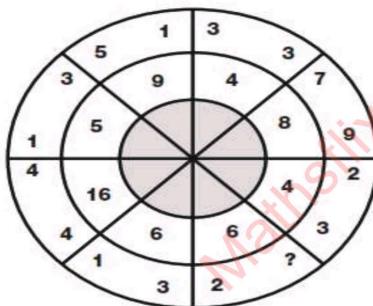
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7, 6, 9, 10

QUESTION 13

Which number replaces the question mark and completes the sequence?



8, 7, 10, 13

QUESTION 14

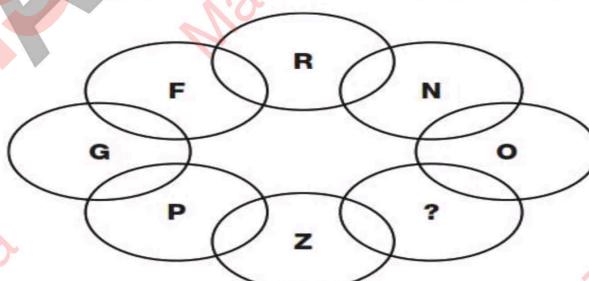
Which letter replaces the question mark and completes the sequence?

13	INC	2
6	QRG	7
4	DOM	8
7	SUI	7
8	AD?	2

K, L, M, N

QUESTION 15

Which letter replaces the question mark and completes the sequence?



H, E, Z, M

QUESTION 16

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Which number replaces the question mark and completes the sequence?

4	2	8	7
6	3	6	6
5	1	5	3

1	0	8	8
7	1	4	2
8	7	2	9

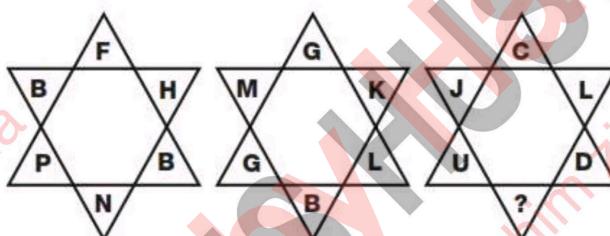
3	2	4	8
2	1	8	9
7	4	9	7

3	0	6	2
4	1	6	4
6	3	?	5

0, 10, 12, 9

QUESTION 17

Which letter replaces the question mark and completes the puzzle?



G, H, F, E

QUESTION 18:

Which number replaces the question mark and completes the puzzle?

3	9
7	2
4	1
9	8
2	1
6	3

1	6
5	7
4	8
4	5
8	1
2	3

4, 5, 2, 10

QUESTION 19:

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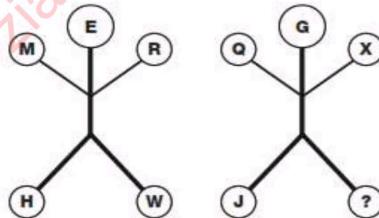
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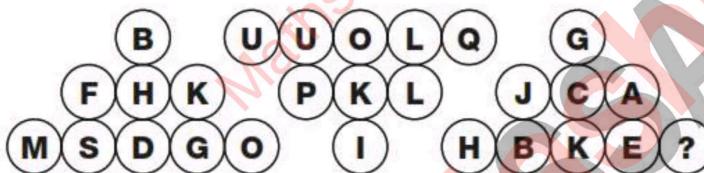
Which letter replaces the question mark and completes the puzzle?



A, W, E, Q

QUESTION 20:

Which letter replaces the question mark and completes the puzzle?



A, B, D, R

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FAST PAST PAPER 1

ENGLISH

ANALOGIES

1. BANDAGE : LACERATION

- A. ambulance : transportation
- C. cast : fracture
- E. oxygen : shock

- B. alcohol : antiseptic

- D. transfusion : blood

2. PEDAL : FOOT

- A. thimble : finger
- C. knob : hand
- E. pillow : head

- B. crutch : leg

- D. belt : waist

SYNONYMS

3. Synonym of ANTIPATHY

- A. abnormal
- D. firm dislike

- B. indifference
- E. daring

- C. conjoined

4. Synonym of ENGENDER

- A. to put in danger
- D. to produce

- B. to show composure
- E. to admire

- C. to improve

ANTONYMS

5. Antonym of NORM

- A. linchpin
- D. anomaly

- B. benchmark
- E. mode

- C. watershed

6. Antonym of APPREHEND

- A. purloin
- D. release

- B. gambol
- E. confer

- C. speculate

SENTENCE COMPLETION

7. After having _____ their current level of study, students are typically ready to move on to the next one.

- A. investigated
- B. studied
- C. attempted
- D. mastered
- E. enjoyed

8. My friend generously offered to _____ my children while I was out, but because we already had a babysitter, I _____ the offer.

- A. look after...took
- B. look after...rejected
- C. monitor...accepted
- D. watch...declined
- E. take after...agreed

PREPOSITIONS

9. He will appear _____ the magistrate.

- A. in front of
- B. to
- C. before

- D. for
- E. near

10. I would like to move _____ Marketing.

- A. into
- B. in
- C. through

- D. at
- E. across

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ANNEES HUSSAIN
FAST PAST PAPER 1

STUDENT'S NAME _____ DATED: _____

SECTION - I MATHEMATICS				SECTION - II BASIC MATH		SECTION - III IQ		SECTION - IV ENGLISH	
1	A	41	D	1	D	1	1	1	C
2	A	42	B	2	B	2	4	2	C
3	A	43	B	3	C	3	B	3	D
4	B	44	D	4	A	4	5	4	D
5	D	45	C	5		5	U	5	D
6	A	46	B	6	C	6	5	6	D
7	C	47	D	7	B	7	22	7	D
8	B	48	B	8	A	8	2	8	B
9	D	49	C	9	C	9	Y	9	C
10	C	50	A	10	A	10	W	10	A
11	C			11	E	11	4		
12	A			12	E	12	7		
13	A			13	D	13	7		
14	C			14	C	14	K		
15	D			15	B	15	H		
16	B			16	C	16	0		
17	B			17	C	17	F		
18	A			18	A	18	5		
19	D			19	D	19	E		
20	B			20	D	20	B		
21	A								
22	A								
23	B								
24	C								
25	A								
26	A								
27	C								
28	B								
29	B								
30	A								
31	B								
32	D								
33	C								
34	D								
35	A								
36	B								
37	D								
38	B								
39	A								
40	C								
W		W		W		W		W	
R		R		R		R		R	

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MATHEMATICS

1. If the ratio of AB to BC is 4:9, what is the area of Parallelogram ABCD?
 - 36
 - 26
 - 18
 - Cannot be determined
2. When any circle in 2nd Quadrant then what will be the equation of the circle when radius is 5 cm
 - $x^2 + y^2 + 10x + 10y + 25 = 0$
 - $x^2 + y^2 + 10x - 10y + 25 = 0$
 - $x^2 + y^2 - 10x - 10y + 25 = 0$
 - $x^2 + y^2 - 10x + 10y + 25 = 0$
3. If a line contains a point $P_1(3, -3)$ and $P_2(-3, 3)$ then the slope of line is?
 - 2
 - 1
 - 1
 - 2
4. If $z = (1, 2)$ then $z^{-1} = ?$
 - (0.2, 0.4)
 - (-0.2, 0.4)
 - (0.2, -0.4)
 - (-0.2, -0.4)
5. $\bar{Z} =$
 - \bar{Z}
 - $-Z$
 - Z
 - None
6. The multiplicative inverse of $1 - 2i$ is
 - $\frac{1}{5} + \frac{2}{5}i$
 - $\frac{1}{3i}$
 - $\frac{1}{5} + \frac{2}{5}i$
 - $\frac{1}{5} - \frac{2}{5}i$
7. Which of the following is not monoid w.r.t. addition?
 - Z
 - W
 - N
 - R
8. The middle term is the expansion of $(a + b)^{12}$ is?
 - 13th
 - 12th
 - 11th
 - None
9. If $A = \{4, 3\}$ then $P(A)$ is
 - $\{\varnothing, \{4\}, \{3\}, \{4, 3\}\}$
 - $\{\{3\}, \{4\}, \{4, 3\}\}$
 - $\{\varnothing, \{3\}, \{4\}\}$
 - $\{\varnothing, \{3, 4\}\}$
10. The set $(Q, +)$
 - Forms a group
 - Does not form a group
 - Contains not additive identity
 - Contain no additive inverse
11. The expansion of $(1 - 3x)^{\frac{2}{3}}$ is valid?
 - $|x| < \frac{1}{3}$
 - $|x| < \frac{1}{2}$
 - $|x| < \frac{2}{3}$
 - $|x| < 1$
12. If $n = (n - 5)^2 + 5$ then find $\#3 \times \#4 = ?$
 - 54
 - 12
 - 4
 - 9

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13. Power set of $X P(X)$ Under the binary operation of union \cup
- 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 distinct 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 $A \cap B$ is
- a) A
 - b) B
 - c) Null set
 - d) $A \cup B$
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 $\frac{1.1}{7}, \frac{-3.3}{7}, \frac{9.9}{7}, \dots$
- a) $\frac{-9.9}{7}$
 - b) $\frac{-11.11}{7}$
 - c) $\frac{29.7}{7}$
 - d) $\frac{-29.7}{7}$
23. The n th 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 6th term is

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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

b) $1 + \frac{1}{x}$

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

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

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

a) Minima

b) Maxima

c) Inflection

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

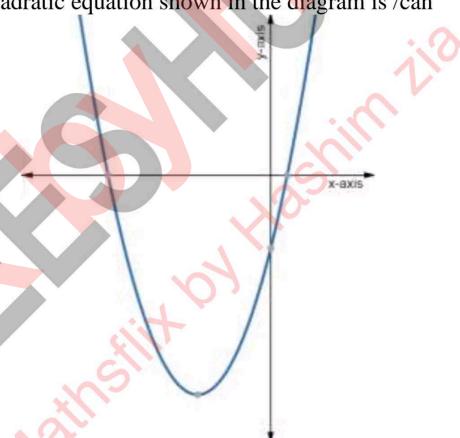
a) $e^{\sin x} + C$

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

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

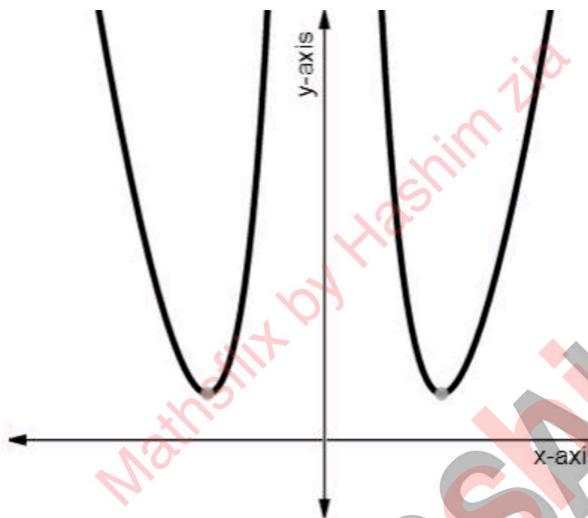
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A. 0
B. 1

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: $\theta \neq n\pi, n \in \mathbb{Z}$)
 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. $\frac{29}{11}$
C. $\frac{11}{29}$

B. $-\frac{29}{11}$
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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FAST PAST PAPER 2

- (A) 2
 (B) 32
 (C) 50

- (D) 120
 (E) 600

10. When ticket sales began, Pat was the n th 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

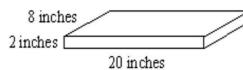
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17. The figure above shows the dimensions of a rectangular box that is to be completely wrapped with paper. If a single sheet of paper is to be used without patching, then the dimensions of the paper could be
(A) 17 in by 25 in (D) 24 in by 14 in
(B)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

$$\begin{array}{r} x - y = 3 \\ 2x = 2y + 6 \end{array}$$

The system of equations above has how many solutions?

- solutions?

(A) None
(B) Exactly one
(C) Exactly two
(D) Exactly three
(E) Infinitely many

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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FAST PAST PAPER 2

IQ

QUESTION 1

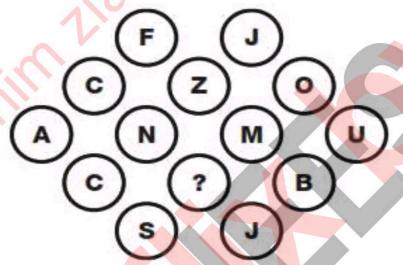
Which number replaces the question mark and completes the puzzle?

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?

4		
1	12	6
2		

	8	
14	24	12
	?	

	3	
7	9	5
	11	

7		
8	21	11
13		

	1	
6	3	1
	9	

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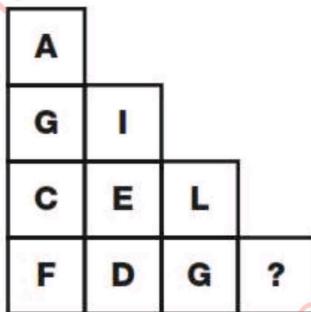
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11, 10, 22, 44

QUESTION 4

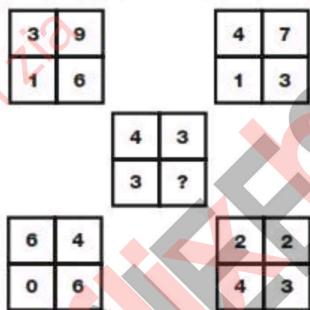
Which letter replaces the question mark
and completes the puzzle?



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?

P	U	Z	E
K	P	U	J
F	K	?	O
A	D	Y	T

X, N, Z, Q

QUESTION 8

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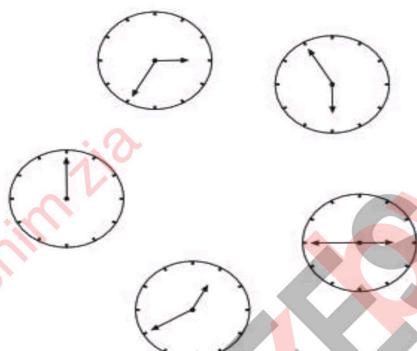
Which letter replaces the question mark
and completes the puzzle?

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

QUESTION 9

X, B, N, J

Where should the missing hour hand point?



QUESTION 10

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

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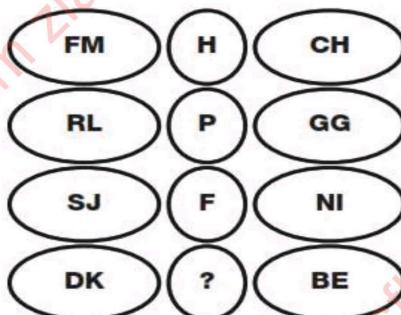
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Which letter replaces the question mark and completes the puzzle?



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QUESTION 11

H, M, B, V

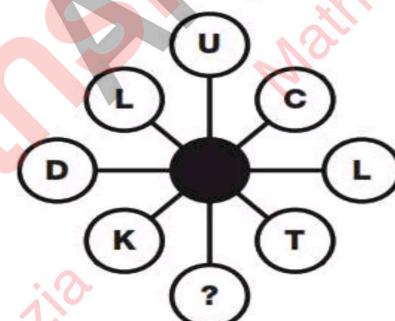
	Bungalow	Flat	Terrace	Shangri-La Way	Honeysuckle Row	Meadow Rise	
Mavis							£40,000
Harold							£75,000
Bette							£100,000
£40,000							
£75,000							
£100,000							
Shangri-La Way							
Honeysuckle Row							
Meadow Rise							

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

QUESTION 12

Which letter replaces the question mark and completes the puzzle?



A, N, C, G

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QUESTION 13

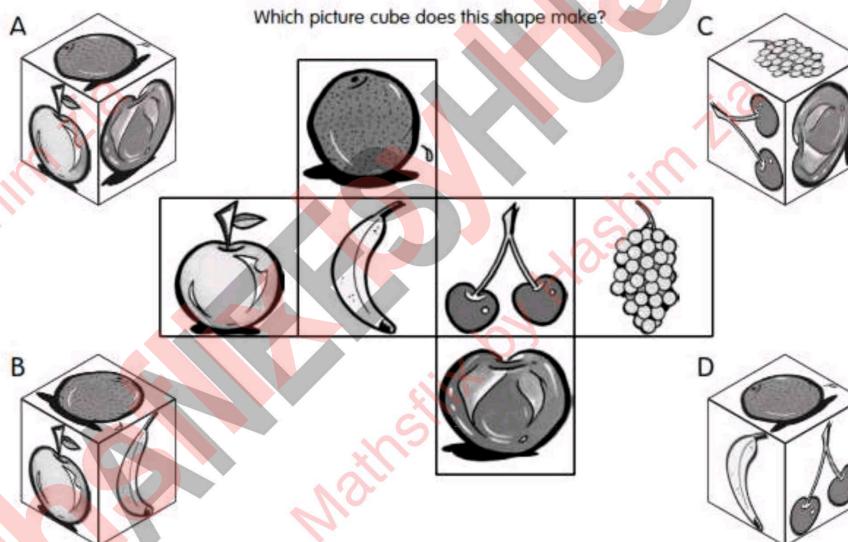
Which number replaces the question mark and completes the puzzle?

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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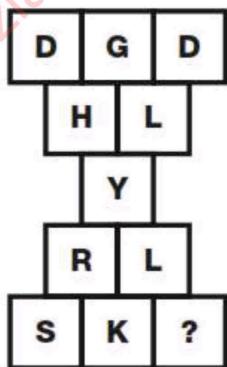
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Which letter replaces the question mark and completes the puzzle?



E, M, N, .B

QUESTION 16

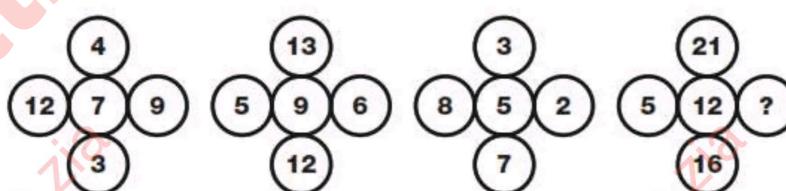
Joe and John are playing marbles. If Joe loses one marble to John, they will both have the same number of marbles, but if John loses one marble to Joe, Joe will have twice the number of marbles as John. How many marbles do the two boys currently have?



- 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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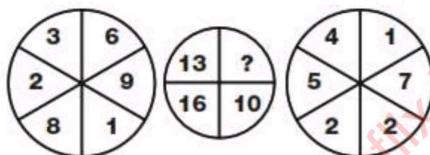
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6, 7, 10, 11

QUESTION 18:

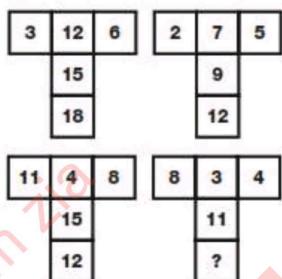
Which number replaces the question mark and completes the puzzle?



12, 11, 10, 9

QUESTION 19:

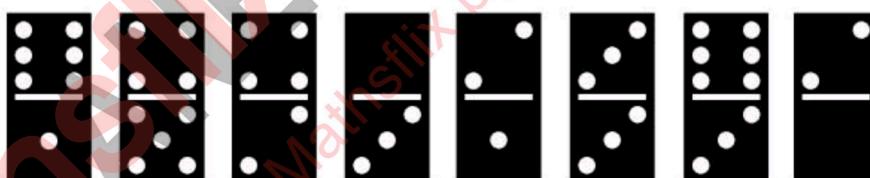
Which number replaces the question mark and completes the puzzle?



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.
C. arc : ellipse D.
E. quart : capacity | sundial : shadow
D. product : shelf life |
| 2. LAWYER : CLIENT
A. doctor : surgeon B.
C. judge : defendant D.
E. tutor : student | B. admiral : sailor
museum : audience |

SYNONYMS

- | | | |
|---|------------------------------------|--|
| 3. Synonym of FIASCO

A. disappointment
D. celebration | B. turning point

E. funfair | C. complete failure

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

ANTONYMS

- | | | |
|--|------------------------------|--------------------------------|
| 5. Antonym of ILLUMINATE
A. precipitate
D. defer | B. hallow

E. refine. | C. obfuscate

C. chronic |
| 6. Antonym of ACUTE
A. rotund
D. jaundiced | B. pervasive
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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ANEES HUSSAIN
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STUDENT'S NAME _____

DATED: _____

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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th>Owner</th><th>Property</th><th>Road</th><th>Value</th></tr> <tr><td>Mavis</td><td>Flat</td><td>Shingle-Lk Way</td><td>\$75,000</td></tr> <tr><td>Harold</td><td>Bungalow</td><td>Mountain-Rise</td><td>\$100,000</td></tr> <tr><td>Bette</td><td>Terrace</td><td>Honey-Moon-Bay</td><td>\$40,000</td></tr> </table>			Owner	Property	Road	Value	Mavis	Flat	Shingle-Lk Way	\$75,000	Harold	Bungalow	Mountain-Rise	\$100,000	Bette	Terrace	Honey-Moon-Bay	\$40,000
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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																		
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MATHEMATICS

1. The integral of $\frac{1}{9x^2+4}$ w.r.t 'x' is $f(x) + c$ is

- a) $\frac{1}{6} \tan^{-1} \frac{3x}{2}$
- b) $\frac{1}{9} \tan^{-1} \frac{3x}{2}$
- c) $\frac{1}{3} \tan^{-1} \frac{3x}{2}$
- d) $\frac{1}{3} \tan^{-1} \frac{3x+2}{3x-2}$

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

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

3. Division is a binary operation on

- a) Set of natural numbers
- b) Set of positive integers
- c) Set of negative integers
- d) None of these

4. The slope of line passing through the points (4, 5) and (3, 7) is

- a) -1
- c) $\frac{1}{2}$
- b) -2
- d) $-\frac{1}{2}$

5. $\int a^x dx$

- a) $\frac{a^x}{\ln a} + C$
- b) $\frac{a^x}{\ln x} + C$
- c) $\frac{a^{-x}}{\ln x} + C$
- d) $\frac{x}{\ln a} + C$

6. The product of (2, -1) and (0, 1) is

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

7. Geometric mean between 50 and 18 is

- a) 28
- b) 30
- c) 32
- d) 36

8. The integral of $\frac{1}{x^3}$ w.r.t x is

- a) $3x^{\frac{1}{3}} + C$
- b) $3x^{\frac{1}{2}} + C$
- c) $\frac{2}{3} x^{-\frac{2}{3}} + C$
- d) $\frac{2}{3} x^{-\frac{3}{2}} + C$

9. The sum of the roots of the equation $x^2 + x + m = 0$ is equal to the product of its roots, then 'm'

- a) -1
- b) 2

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- c) 3 d) -2

10. A fair coin is tossed twice. What is the probability of both heads?

a) $\frac{3}{8}$ c) $\frac{3}{4}$
b) $\frac{1}{4}$ d) $\frac{1}{2}$

11. The n^{th} term of the following sequence 2, 5, 10, 17 is

a) $2n-3$ c) $n^2 + 1$
b) $n + 1$ d) $5n - 3$

12. If $x + y = 8$ and $xy = 15$ then $x - y = ?$

a) 4 c) 6
b) 2 d) 9

13. The number of ways in which 5 differently colored flags can be arranged in a row are.

a) 50 c) 180
b) 120 d) 100

14. The limit of $\frac{\sin x}{x}$ as "x" tends to zero is

a) 0 c) 2
b) 1 d) ∞

15. If $y = a^x$, then $y' = ?$

a) a^x c) $a^x \ln x$
b) $a^x \ln a$ d) None of these

16. The area of triangle formed from (11, -12), (6, 2) and (-5, 10) is

a) 57 c) 50
b) 56 d) 51

17. If two lines are parallel then their slopes are

a) 0 c) equal
b) 1 d) unequal

18. The angle formed by $x^2 - 6xy + 9y^2 = 0$

a) 60° c) 45°
b) 90° d) 0°

19. $\int \frac{dx}{a^2 + x^2} = ?$

a) $\frac{1}{a} \sin^{-1} \frac{x}{a} + C$ c) $\frac{1}{a} \sec^{-1} \frac{x}{a} + C$
b) $\frac{1}{a} \tan^{-1} \frac{x}{a} + C$ d) $\frac{1}{a} \cos^{-1} \frac{x}{a} + C$

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20. Area under the curve $x^2 + y^2 = 4$ between the ordinates $x = \frac{1}{2}$ and $x = \frac{3}{2}$

- a) 32
- b) 16
- c) 25
- d) none of them

21. The centre of $4x^2 + 4y^2 - 12x + 4y - 15 = 0$ is

- a) $\left(\frac{1}{2}, \frac{3}{5}\right)$
- b) $\left(\frac{1}{5}, \frac{3}{2}\right)$
- c) $\left(\frac{3}{2}, -\frac{1}{2}\right)$
- d) $\left(\frac{4}{5}, \frac{6}{5}\right)$

22. The parametric equation of a circle with radius 'a' are

- a) $X = a \cos \theta, Y = a \sin \theta$
- b) $X = r \cos \theta, Y = r \sin \theta$
- c) $X = r \cos \theta, Y = r \cos \theta$
- d) $X = r \tan \theta, Y = r \sec \theta$

23. The radius of the circle $4x^2 + 4y^2 - 12x + 4y - 15 = 0$ is

- a) $\frac{5}{4}$
- b) $\frac{5}{2}$
- c) $\frac{5}{6}$
- d) $\frac{5}{3}$

24. The length of the tangent from $(-4, 6)$ to $2x^2 + 2y^2 = 3$ is

- a) 18.3
- b) 5.2
- c) 7.1
- d) $\frac{5}{3}$

25. Equation of the parabola whose vertex is $(0,0)$ and focus is $(0, -3)$ is

- a) $y = x^2$
- b) $x^2 = -12y$
- c) $y^2 = 12x$
- d) $x^2 = 12y$

26. $(x + 3i)^2 = 2yi$ then (x, y) is

- a) $(-3, -9)$
- b) $(3, 7)$
- c) $(0, 0)$
- d) none of these

27. A unit matrix of order 3×3 is

- a) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- b) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$
- c) $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$
- d) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

28. If $\begin{vmatrix} y^2 & y & 1 \\ 8 & 4 & 10 \\ 9 & 3 & 6 \end{vmatrix} = 60$ then $y = ?$

- a) 4
- b) 4, 5
- c) 3, 4
- d) 2, 7

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29. The equation $2x^2 + 6x - 3 = 0$ has α and β find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$

- a) -3
- b) $\frac{3}{2}$

- c) 1
- d) 2

30. $x + 10 = 14$ then $x - 8 = ?$

- a) -4
- b) 4

- c) 1
- d) 2

31. The n^{th} term of the geometric mean sequence $8, 16\sqrt{2}, 64, \dots$ is

- a) $n\sqrt{2}$
- b) $(n\sqrt{2})^2$

- c) $(2\sqrt{2})^2$
- d) $(2\sqrt{2})^{n+1}$

32. A machine is depreciated at rate of 10% on reducing balance the original cost was Rs 10,000 after how many years it will be valued at Rs 8100

- a) 2
- b) 3

- c) 4
- d) none

33. The given progression $4, 3, \frac{9}{4}, \dots$ is

- a) H.P
- b) G.P

- c) A.P
- d) None of these

34. In how many different ways may the seven letters in the word KARACHI be arranged if all of the letters are used each time?

- a) 2500
- b) 2520

- c) 2400
- d) 2420

35. How many words can be formed out of the letters of the word "JEDDAH"

- a) 360
- b) 420

- c) 240
- d) None of these

36. Which of the expansion of $\left(\frac{1}{x} + x^2\right)^9$ contains no power of x

- a) No term
- b) Fourth

- c) Fifth
- d) sixth

37. π radians are always equal to

- a) 360°
- b) 180°

- c) 270°
- d) None of these

38. $\sin 60^\circ \sin 30^\circ - \cos 60^\circ \sin 60^\circ$

- a) zero

- b) $\frac{1}{3}$

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c) $\frac{\sqrt{3}}{2}$

d) $\frac{3}{2}$

39. Composite function of $g(x) = x^2 - 1$, $f(x) = 2x - 1$ is

a) $2x^2 - 1$

c) $4x^2 - 4x$

b) $4x^2 - 4x - 2$

d) None of these

40. $\frac{d}{dx} \sqrt{x} = ?$

a) $\frac{1}{2\sqrt{x}}$

c) $\frac{1}{\sqrt{x}}$

b) $2/\sqrt{x}$

d) $2\sqrt{x}$

41. If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 \\ 4 & 2 \end{bmatrix}$ then $A + B$ is

A. $\begin{bmatrix} 1 & -1 \\ 2 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 2 & 0 \\ 6 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 \\ 2 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 2 & 0 \\ 6 & 1 \end{bmatrix}$

42. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & -3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$ then AB is equal to

A. not possible

D. $\begin{bmatrix} -3 \\ 3 \end{bmatrix}$

B. $\begin{bmatrix} -6 & 12 & 2 \end{bmatrix}$

C. $\begin{bmatrix} -3 \\ 9 \end{bmatrix}$

43. If $A = \begin{bmatrix} x & y & z \\ -2 & 0 & -1 \\ 3 & 1 & 0 \end{bmatrix}$ is skew symmetric, then (x, y, z) is equal to

A. $(0, 2, -3)$

C. $(0, -2, 3)$

B. $(0, -1, 3)$

D. $(1, 2, 3)$

44. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}^4 =$

A. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 4 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

45. If $A = \begin{bmatrix} 12 & \frac{1}{3} \\ 3 & 5 \end{bmatrix}$, then the value of $|A^4|$ is equal to

A. $(27)^4$

C. $(59)^4$

B. $(13)^4$

D. $(60)^4 - 1$

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46. The matrix $\begin{bmatrix} 5 & 10 & 3 \\ -2 & -4 & 6 \\ -1 & -2 & b \end{bmatrix}$ is a singular matrix if

- A. $b = -3$
- B. $b = 0$
- C. $b = 3$
- D. $b \in \mathbb{R}$

47. If A is a square matrix of order n then $|adj A|$ is equal to

- A. $|A|^{n-1}$
- B. $|A|^n$
- C. $|A|^{2n}$
- D. $\frac{1}{|A|^n}$

48. If A is matrix of order 4 and $|A| = 5$, then $|Adj A|$ is equal to

- A. 1
- B. 20
- C. 5^2
- D. 125

49. The minor of -4 and 9 and the cofactors of -4 and 9 in the matrix $\begin{bmatrix} -1 & -2 & 3 \\ -4 & -5 & -6 \\ -7 & 8 & 9 \end{bmatrix}$ are respectively

- A. $42, 3 ; -42, 3$
- B. $-42, -3 ; 42, -3$
- C. $42, 3 ; -42, -3$
- D. $42, 3 ; 42, 3$

50. If $A = \begin{bmatrix} 2 & 3 & 4 \\ 5 & 6 & 7 \\ 8 & 0 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & -9 \\ 6 & 7 & 8 \\ 9 & 0 & 0 \end{bmatrix}$, then $(B^t A^t)^t$ is equal to

- A. $\begin{bmatrix} 9 & 0 & 0 \\ 18 & 0 & 0 \\ 8 & 0 & 0 \end{bmatrix}$
- B. $\begin{bmatrix} 9 & 18 & 8 \\ 18 & 0 & 0 \\ 8 & 0 & 0 \end{bmatrix}$
- C. $\begin{bmatrix} 9 & 18 & 8 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- D. $\begin{bmatrix} 2 & 3 & 4 \\ 5 & 6 & 7 \\ 8 & 0 & 0 \end{bmatrix}$

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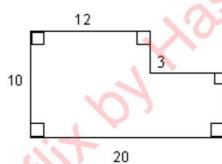
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BASIC MATH

1. $6.09 - 4.693 =$

- (A) 1.397
- (B) 1.403
- (C) 1.407

- (D) 1.497
- (E) 2.603



2. What is the area of the region enclosed by the figure above?

- (A) 116
- (B) 144
- (C) 176

- (D) 179
- (E) 284

3. If $p = 0.2$ and $n = 100$, then $\sqrt{\frac{p(1-p)}{n}} =$

- (A) $-\sqrt{0.002}$
- (B) $\sqrt{0.02} - 0.02$

- (C) 0
- (D) 0.04
- (E) 0.4

4. If each of 4 subsidiaries of Corporation R has been granted a line of credit of \$700,000 and each of the other 3 subsidiaries of Corporation R has been granted a line of credit of \$112,000, what is the average (arithmetic mean) line of credit granted to a subsidiary of Corporation R?

- (A) \$1,568,000
- (B) \$448,000
- (C) \$406,000

- (D) \$313,600
- (E) \$116,000

5. If x is a number such that $x^2 - 3x + 2 = 0$ and $x^2 - x - 2 = 0$, what is the value of x ?

- (A) -2
- (B) -1
- (C) 0

- (D) 1
- (E) 2

6. In traveling from a dormitory to a certain city, a student went $\frac{1}{5}$ of the way by foot, $\frac{2}{3}$ of the way by bus, and the remaining 8 kilometers by car. What is the distance, in kilometers, from the dormitory to the city?

- (A) 30
- (B) 45
- (C) 60

- (D) 90
- (E) 120

7. A certain elevator has a safe weight limit of 2,000 pounds. What is the greatest possible number of people who can safely ride on the elevator at one time with the average (arithmetic mean) weight of half the riders being 180 pounds and the average weight of the others being 215 pounds?

- (A) 7
- (B) 8
- (C) 9

- (D) 10
- (E) 11

8. After paying a 10 percent tax on all income over \$3,000, a person had a net income of \$12,000. What was the income before taxes?

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- (A) \$13,300
(B) \$13,000
(C) \$12,900

(D) \$10,000
(E) \$9,000

9. $1 - [2 - (3 - [4 - 5] + 6) + 7] =$

(A) -2
(B) 0
(C) 1
(D) 2
(E) 16

10. The price of a model M camera is \$209 and the price of a special lens is \$69. When the camera and lens are purchased together, the price is \$239. The amount saved by purchasing the camera and lens together is approximately what percent of the total price of the camera and lens when purchased separately?

(A) 14%
(B) 16%
(C) 29%
(D) 33%
(E) 86%

11. If 0.497 mark has the value of one dollar, what is the value to the nearest dollar of 350 marks?

(A) \$174
(B) \$176
(C) \$524
(D) \$696
(E) \$704

12. A right cylindrical container with radius 2 meters and height 1 meter is filled to capacity with oil. How many empty right cylindrical cans, each with radius $\frac{1}{2}$ meter and height 4 meters, can be filled to capacity with the oil in this container?

(A) 1
(B) 2
(C) 4
(D) 8
(E) 16

13. If a sequence of 8 consecutive odd integers with increasing values has 9 as its 7th term, what is the sum of the terms of the sequence?

(A) 22
(B) 32
(C) 36
(D) 40
(E) 44

14. A rectangular floor is covered by a rug except for a strip p meters wide along each of the four edges. If the floor is m meters by n meters, what is the area of the rug, in square meters?

(A) $mn - p(m + n)$
(B) $mn - 2p(m + n)$
(C) $mn - p^2$
(D) $(m - p)(n - p)$
(E) $(m - 2p)(n - 2p)$

15. Working alone, R can complete a certain kind of job in 9 hours. R and S , working together at their respective rates, can complete one of these jobs in 6 hours. In how many hours can S , working alone, complete one of these jobs?

(A) 18
(B) 12
(C) 9
(D) 6
(E) 3

16. A family made a down payment of \$75 and borrowed the balance on a set of encyclopedias that cost \$400. The balance with interest was paid in 23 monthly payments of \$16 each and a final payment of \$9. The amount of interest paid was what percent of the amount borrowed?

(A) 6%
(B) 12%
(C) 14%
(D) 16%
(E) 20%

17. If $x \neq 0$ and $x = \sqrt{4xy - 4y^2}$, then, in terms of y , $x =$

(A) $2y$
(B) y

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(C) $\frac{y}{2}$

(D) $\frac{-4y^2}{1-2y}$
(E) $-2y$

18. Solution Y is 30 percent liquid X and 70 percent water. If 2 kilograms of water evaporate from 8 kilograms of solution Y and 2 kilograms of solution Y are added to the remaining 6 kilograms of liquid, what percent of this new solution is liquid X?

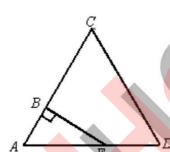
- (A) 30%
(B) $33\frac{1}{3}\%$

- (C) $37\frac{1}{2}\%$
(D) 40%
(E) 50%

19. $\frac{1}{\frac{1}{0.03} + \frac{1}{0.37}} =$

- (A) 0.004
(B) 0.02775
(C) 2.775

- (D) 3.6036
(E) 36.036



20. If each side of $\triangle ACD$ above has length 3 and if AB has length 1, what is the area of region $BCDE$?

- (A) $\frac{9}{4}$
(B) $\frac{7}{4}\sqrt{3}$

- (C) $\frac{9}{4}\sqrt{3}$
(D) $\frac{7}{2}\sqrt{3}$
(E) $6 + \sqrt{3}$

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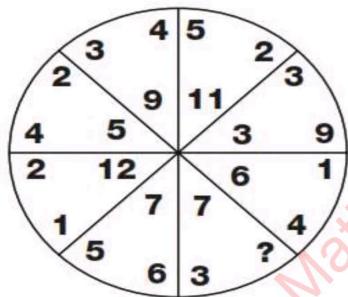
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IQ

QUESTION 1

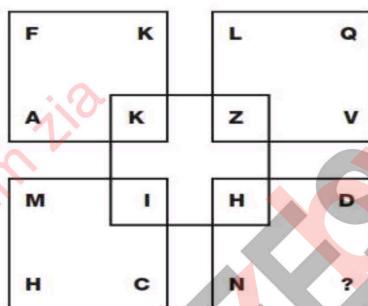
Which number is missing?



6, 4, 5, 2

QUESTION 2

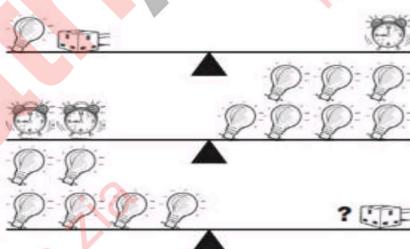
Which letter completes the puzzle?



1, 2, 4, 6

QUESTION 3

Which symbol replaces the question mark and completes the puzzle?



ALARM CLOCK, DIE, BULB

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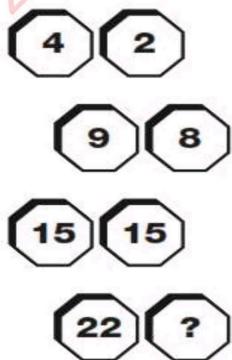
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QUESTION 4

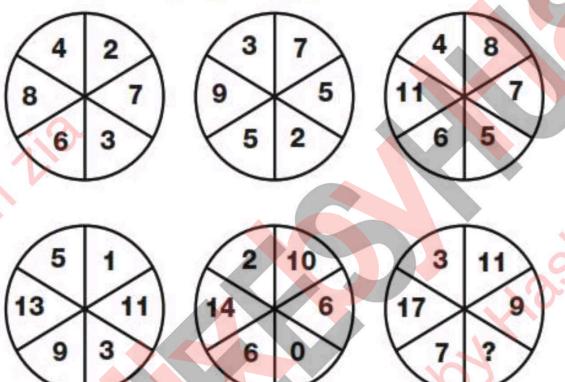
Which number replaces the question mark
and completes the puzzle?



22, 23, 11, 10

QUESTION 5

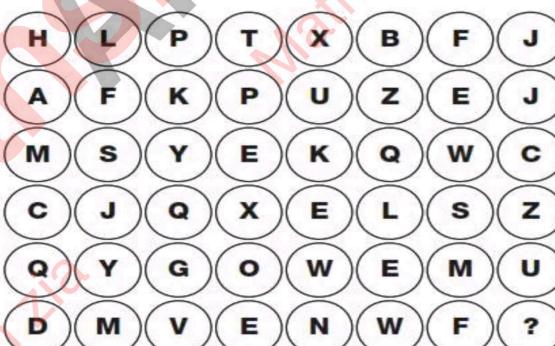
What is missing from the last circle?



1, 4, 5, 9

QUESTION 6

Which letter replaces the question mark and completes the puzzle?



O, M, B, V

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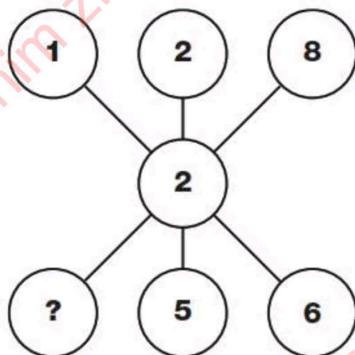
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QUESTION 7

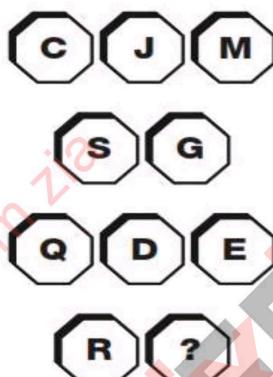
What is missing from the bottom left circle?



2, 8, 6, 9

QUESTION 8

Which letter completes the puzzle?



J, H, M, B

QUESTION 9

Which number replaces the question mark and completes the puzzle?

- | | | | | |
|----|----|----|----|---|
| 32 | 45 | 60 | 77 | ? |
|----|----|----|----|---|

99, 96, 89, 44

QUESTION 10

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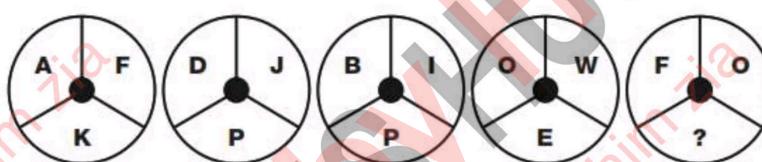
Which number replaces the question mark
and completes the puzzle?

3	5
4	1
4	7
5	3
5	?

9, 8, 5, 3

QUESTION 11

What is missing from the last circle?



V, W, X, M

QUESTION 12

Which number replaces the question mark
and completes the puzzle?

1	2	3
2	1	4
5	6	?

1, 2, 4, 3

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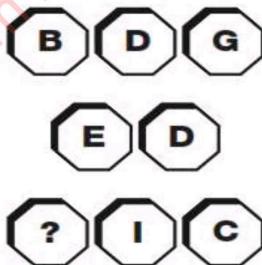
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QUESTION 13

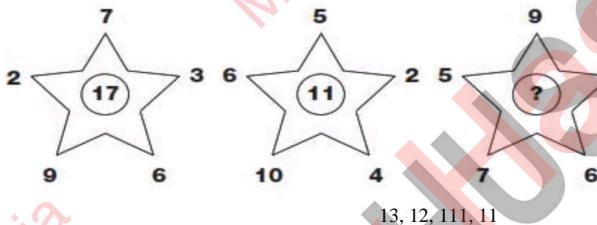
Which letter completes the puzzle?



B, C, A, D

QUESTION 14

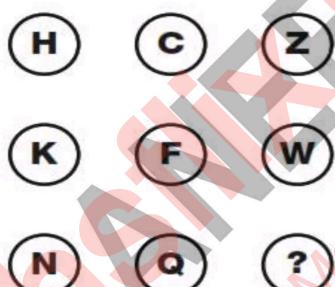
Which number replaces the question mark and completes the puzzle?



13, 12, 111, 11

QUESTION 15

What is missing from the last circle?



Q, N, T, B

QUESTION 16

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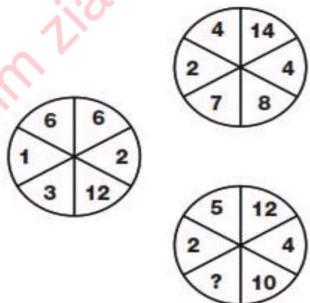
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Which number completes the puzzle?



QUESTION 17

6, 5, 4, 1

- H D X W B

Which of the bottom letters replace the question mark and completes the puzzle?



QUESTION 18

W, M, N, B

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What is missing from the last oval?

7122

6521

8332

4743

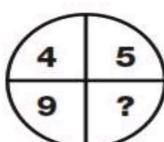
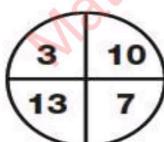
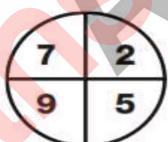
9911

387?

QUESTION 19:

4, 1, 2, 6

Which number completes the puzzle?



1, 2, 3, 5

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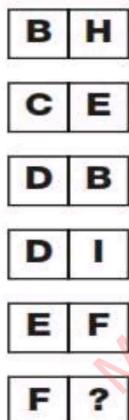
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QUESTION 20:

Which letter replaces the question mark and completes the puzzle?



C, M, N, B

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ENGLISH

ANALOGIES

- | | |
|---------------------------|-----------------------|
| 1. DOOR : WALL | |
| A. toll : road | B. guard : border |
| C. gate : fence | D. bridge : river |
| E. key : lock | |
| 2. CARNIVORE : MEAT | |
| A. carnivore : vegetables | B. herbivore : plants |
| C. vegetarian : vitamins | D. botanist : herbs |
| E. pollinator : plants | |

SYNONYMS

- | | |
|----------------------|-----------------|
| 3. Synonym of ACCESS | |
| A. agreement | B. rapidity |
| D. approach | E. incompetence |

- | | |
|-----------------------|-----------------|
| 4. Synonym of PRUDENT | |
| A. generous | B. overcritical |
| D. dull | E. cautious |

ANTONYMS

- | | |
|------------------------|--------------|
| 5. Antonym of ANIMATED | |
| A. worthy | B. humorous |
| D. lengthy | E. realistic |
-
- | | |
|-------------------------|--------------|
| 6. Antonym of EXTROVERT | |
| A. clown | B. hero |
| D. neurotic | E. introvert |

SENTENCE COMPLETION

7. The four close friends decided to attend different colleges. At first, they were _____ to leave each other, but eventually they were glad they each made their own _____.
- | | | |
|-----------------------|-----------------------|----------------------|
| A. excited...decision | B. reluctant...choice | C. frustrated...plan |
| D. happy...friendship | E. depressed...bond | |

8. Samuel is loyal to his roots (he always has been), and is resistant to change. Raphael, however, favors a less traditional, more _____ approach.
- | | | |
|------------|-----------------|------------|
| A. patient | B. contemporary | C. diverse |
| D. liberal | E. forgiving | |

PREPOSITIONS

- | | | | | |
|-------------------------------------|---------|---------|--------|-----------|
| 9. The play was made _____ a movie. | | | | |
| A. by | B. into | C. with | D. for | E. across |
-
- | | | | | |
|---|----------|-----------|--------|----------------|
| 10. The whole nation was _____ the president. | | | | |
| A. behind | B. after | C. before | D. for | E. in front of |

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check ECAT MATHS playlist

ANEES HUSSAIN
FAST PAST PAPER

STUDENT'S NAME _____

DATED: _____

SECTION - I MATHEMATICS				SECTION - III BASIC MATH		SECTION - IV IQ		SECTION - V ENGLISH	
1	A	41	D	1	A	1	6	1	C
2	B	42	A	2	C	2	1	2	B
3	D	43	A	3	D	3	ALARM CLOCK	3	D
4	B	44	A	4	B	4	23	4	E
5	B	45	C	5	E	5	5	5	C
6	A	46	D	6	C	6	0	6	E
7	B	47	A	7	B	7	2	7	B
8	A	48	D	8	B	8	H	8	B
9	A	49	B	9	D	9	96	9	B
10	B	50	A	10	A	10	9	10	A
11	C			11	E	11	X		
12	B			12	C	12	3		
13	B			13	B	13	A		
14	B			14	E	14	13		
15	B			15	A	15	T		
16	A			16	D	16	6		
17	C			17	A	17	W		
18	D			18	C	18	4		
19	B			19	B	19	1		
20	D			20	B	20	C		
21	C								
22	A								
23	B								
24	C								
25	B								
26	A								
27	D								
28	C								
29	D								
30	A								
31	D								
32	A								
33	B								
34	B								
35	A								
36	B								
37	B								
38	A								
39	C								
40	A								

W		W		W		W		W	
R		R		R		R		R	

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This is Muhammad Hashim zia, Aptitude mathematics lecturer. Alhumdulillah number of mine students are currently studying in NUST GIKI FAST UET NED DAWOOD MUET etc by watching mine free aptitude video Lectures Check ECAT maths playlist on my YouTube channel MATHSFLIX BY HASHIM ZIA