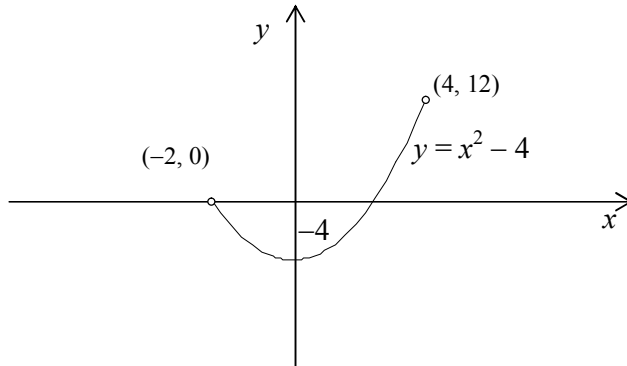


## MCA (Final)

1. If  $f$  is a function for which the rule is  $f(x) = \frac{7}{8} - x$ , where  $x$  is real, the rule for the inverse function  $f^{-1}$  is

(A)  $f^{-1}(x) = \frac{8}{7} + x$                       (B)  $f^{-1}(x) = -\frac{8}{7}$   
(C)  $f^{-1}(x) = \frac{2x + 73}{4}$                       (D)  $f^{-1}(x) = \frac{7}{8} - x$

2. The range of the function with graph as shown is



(A)  $R$     (B)  $(-1, 12)$   
(C)  $(0, 3)$     (D)  $[-4, 12)$

3. If  $f(x) = \begin{cases} -2x + 6 & \text{if } x \geq -2 \\ x + 2 & \text{if } x < -2 \end{cases}$ , then the range of  $f$  is

(A)  $(-\infty, 10]$     (B)  $(-\infty, 2)$   
(C)  $(-\infty, 2]$     (D)  $[2, \infty) \cup (-2, 0]$

4. If  $f(x) = x^2 + 1$  and  $g(x) = 2x + 1$ , then  $f(g(a)) =$

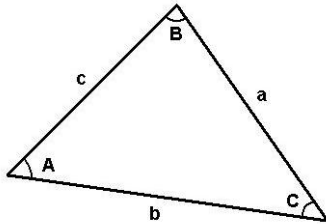
(A)  $4a^2 + 4a + 1$     (B)  $4a$   
(C)  $4a^2 + 4a + 2$     (D)  $4a^2 + 1$

5. Which of the following functions is not one-to-one?

(A)  $f(x) = 9 - x^2, x \geq 0$     (B)  $f(x) = \frac{1}{x^2} - 9$   
(C)  $f(x) = 1 - 9x$     (D)  $f(x) = \sqrt{x}$

6. In a triangle ABC, if angle  $A = 72^\circ$ , angle  $B = 48^\circ$  and  $c = 9$  cm then  $\hat{C}$  is
- (A)  $69^\circ$  (B)  $66^\circ$   
 (C)  $60^\circ$  (D)  $63^\circ$

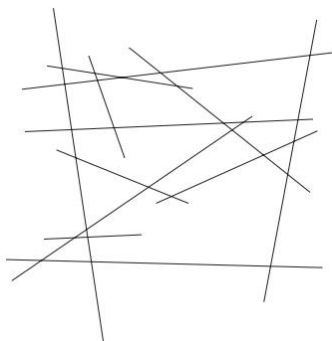
**Direction (Qn. Nos. 7 and 8):** Refer to the oblique (*i.e.* non-right) triangle ABC in the figure below with sides of length  $a$ ,  $b$ , and  $c$ , and with interior angles  $A$ ,  $B$ , and  $C$  measured in degrees. Note that the oblique triangle could also have one obtuse angle (not depicted in this figure).



7. If  $A = 20^\circ$ ,  $a = 2$ ,  $b = 3$ , then what is  $c$ ?
- (A) 4.54 (B) 1.10  
 (C) 4.54 or 1.10 (D) The triangle ABC does not exist
8. If  $a = 3$ ,  $A = 50^\circ$ ,  $C = 35^\circ$ , then what is the perimeter of ABC?
- (A) 8.86 (B) 8.92  
 (C) 9.15 (D) 9.34
9. The area of the region bounded by the curves  $y = |x - 1|$  and  $y = 3 - |x|$  is
- (A) 2 sq units (B) 3 sq units  
 (C) 4 sq units (D) 6 sq units
10. In a circle with center  $O$ ,  $AB$  and  $CD$  are two diameters, perpendicular to each other. Then the area of ABCD is,
- (A)  $AB^2/2$  (B)  $AB^2$   
 (C)  $AB$  (D)  $AB/\sqrt{2}$
11. The perimeter of a rectangular field is 480 m and ratio between the length and breadth is 5 : 3. The area of the field is
- (A)  $1350 \text{ m}^2$  (B)  $13500 \text{ m}^2$   
 (C)  $54000 \text{ m}^2$  (D) 5.4 km

12. 24-carat gold is pure gold. 18-carat gold is  $\frac{3}{4}$  gold, 20-carat gold is  $\frac{5}{8}$  gold. The ratio of pure gold in 18-carat gold to pure gold in 20-carat gold is
- (A) 5 : 8 (B) 9 : 10  
(C) 15 : 24 (D) 8 : 5
13. What is the exact value of the expression  $8 \cdot (\sin 70^\circ \cos 40^\circ - \cos 70^\circ \sin 40^\circ)^3$ ?
- (A) 1 (B)  $3\sqrt{3}$   
(C) -1 (D)  $-3\sqrt{3}$
14. What is the multiplicative inverse of  $\frac{3}{4} + \frac{3}{4}i$ ?
- (A)  $\frac{3+3i}{4}$  (B)  $\frac{4}{3+3i}$   
(C)  $\frac{4}{3}$  (D)  $\frac{3}{4}$
15. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?
- (A) 5 (B) 10  
(C) 15 (D) 20
16.  $(a^{-3}b^{-2} / a^2b^2)^{-3} * (a^3b^{-4} / a^{-3}b^3) / (a^{-2}b^3 / a^{-4}b^{-3}) = ?$
- (A)  $a^{-19}b^{-1}$  (B)  $a^{-19}b$   
(C)  $a^{19}b^{-1}$  (D)  $a^{19}b$
17. If  $x < y$  and  $a = b$ , then
- (A)  $x + a = y + b$  (B)  $x + a < y + b$   
(C)  $x + a > y + b$  (D)  $x + a = y$

18. How many lines are appearing in the figure?



- (A) 11  
(B) 12  
(C) 13  
(D) 14
19. What is the unique solution of the system  $\begin{cases} x - 2z = 1 \\ 2x + 3y = -3 \\ 4x - 3y - 4z = 3 \end{cases}$  ?

- (A)  $(x, y, z) = (3, -2, 1)$   
(B)  $(x, y, z) = (3, -3, 1)$   
(C)  $(x, y, z) = \left(\frac{3}{2}, -\frac{3}{4}, -\frac{1}{2}\right)$   
(D)  $(x, y, z) = \left(-\frac{1}{2}, -\frac{2}{3}, -\frac{3}{4}\right)$

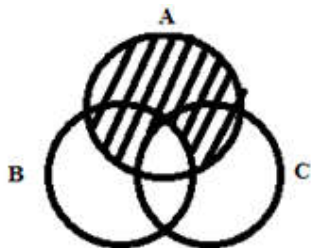
20. Given that  $a$  and  $b$  are integers, which of the following is **not** necessarily an integer?

- (A)  $2a - 5b$   
(B)  $a^7$   
(C)  $b^a$   
(D)  $ab$

21.  $2p^2 - 15p + 25 =$

- (A)  $(p-5)(2p-5)$   
(B)  $(p-5)(2p+5)$   
(C)  $(p+5)(2p-5)$   
(D)  $(2p-15)(p+5)$

22. Which one of the following shall represent the shaded area in the diagram?



- (A)  $A \cap (B \cup C)$   
(B)  $A \cup (B \cup C)$   
(C)  $A \cup (B \cap C)$   
(D)  $A \cup B \cup C$

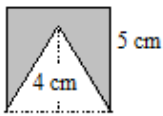
23. Which of the following is a subset of  $\{b, c, d\}$ ?

- (A)  $\{\}$  (B)  $\{a\}$   
 (C)  $\{1, 2, 3\}$  (D)  $\{a, b, c\}$

24. How many subsets does the set  $\{a, b, c, d, e\}$  have?

- (A) 2 (B) 5  
 (C) 10 (D) 32

25. The figure, **not drawn to scale**, shows a triangle of height 4 cm cut from a shaded square of sides 5 cm. What is the area, in  $\text{cm}^2$  of the remaining shaded region of the square?



- (A) 5 (B) 10  
 (C) 15 (D) 20

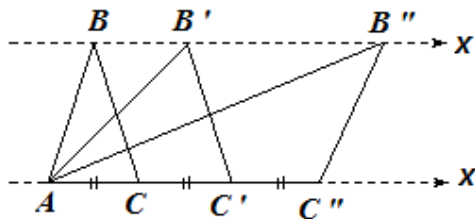
26. City  $x$  is 200 miles east of city  $y$  and city  $z$  is 150 miles directly north of city  $y$ . What is the shortest distance between  $x$  and  $z$ ?

- (A) 507 (B) 175  
 (C) 200 (D) 250

27.  $R$  and  $T$  are points on straight line  $PQ$  on which  $PR = RT = TQ$ . What percent of  $PT$  is  $PQ$ ?

- (A)  $1\frac{1}{2}\%$  (B) 50%  
 (C)  $66\frac{1}{2}\%$  (D) 150%

28.



In the diagram above, triangle  $ABC$  is stretched along the  $x$  direction to form triangle  $AB'C'$  and then triangle  $AB''C''$ .  $AC = CC' = C'C''$ . What is the ratio of the areas of the three triangles?

- (A) 1 : 1 : 1 (B) 1 : 1 : 2  
 (C) 1 : 2 : 2 (D) 1 : 2 : 3

29. If  $x_1, x_2, x_3$  and  $y_1, y_2, y_3$  are both in G.P. with the same common ratio, then the points  $(x_1, y_1), (x_2, y_2)$  and  $(x_3, y_3)$
- (A) lie on a straight line                      (B) lie on an ellipse  
(C) lie on a circle                                (D) are vertices of a triangle
30. Distance between two parallel planes  $2x + y + 2z = 8$  and  $4x + 2y + 4z + 5 = 0$  is
- (A)  $3/2$     (B)  $5/2$   
(C)  $7/2$     (D)  $9/2$
31. If  $2a + 3b + 6c = 0$ , then at least one root of the equation  $ax^2 + bx + c = 0$  lies in the interval
- (A)  $(0, 1)$                                         (B)  $(1, 2)$   
(C)  $(2, 3)$                                         (D)  $(1, 3)$
32. If the system of linear equations  
 $x + 2ay + az = 0$   
 $x + 3by + bz = 0$   
 $x + 4cy + cz = 0$   
 has a non-zero solution, then  $a, b, c$
- (A) are in A. P.                                    (B) are in G. P.  
(C) are in H.P.                                    (D) satisfy  $a + 2b + 3c = 0$
33. A box contains nine bulbs out of which 4 are defective. If four bulbs are chosen at random, find the probability that exactly three bulbs are good.
- (A)  $20/31$                                         (B)  $20/63$   
(C)  $5/31$                                         (D)  $6/31$
34. A die is thrown. Let A be the event that the number obtained is greater than 3. Let B be the event that the number obtained is less than 5. Then  $P(A \cup B)$  is
- (A)  $3/5$     (B) 0  
(C) 1    (D)  $5/2$
35. How many ways are there to arrange the letters in the word GARDEN with the vowels in alphabetical order?
- (A) 120    (B) 480  
(C) 360    (D) 240

36. The mean and the variance of a binomial distribution are 4 and 2 respectively. Then the probability of 2 successes is
- (A)  $\frac{37}{256}$  (B)  $\frac{219}{256}$   
(C)  $\frac{128}{256}$  (D)  $\frac{28}{256}$
37. Two dice are thrown simultaneously. The probability that the sum of the faces turning up is 7 is equal to
- (A)  $\frac{1}{6}$  (B)  $\frac{1}{36}$   
(C)  $\frac{1}{9}$  (D)  $\frac{1}{12}$
38. Two cars start towards each other from points 400 miles apart. One car travels at 40 miles an hour and the other travels at 35 miles an hour. How far apart, in miles, will the two cars be after 4 hours of continuous travelling?
- (A) 20 (B) 40  
(C) 75 (D) 100
39. In the expansion of  $(1+x)^{50}$  the sum of the coefficients of odd power of  $x$  is
- (A) 0 (B)  $2^{49}$   
(C)  $2^{50}$  (D)  $2^{51}$
40. Aravind is twice as old as Vijay and half as old as Suresh. If sum of Suresh's and Vijay's age is 85 years, then what is Aravind's age?
- (A) 34 (B) 36  
(C) 68 (D) None of the above
41. What can you say about the graph of the polar equation  $2r = 2r \sin \theta + 8$ ?
- (A) It's an ellipse  
(B) It's a parabola that opens to the left with vertex  $V = (2, 0)$ .  
(C) It's a parabola that opens up with the vertex at  $V = \left(2, \frac{3\pi}{2}\right)$   
(D) It's a hyperbola
42. Point P (4, 2) is the midpoint of line OPC, where O is at origin (0, 0). The coordinates of C are
- (A) (2, 1) (B) (4, 8)  
(C) (8, 2) (D) (8, 4)

43. The equations of two lines are shown below.  
 $2x - 4y = 6$   
 $3x + y = -5$   
 What are the coordinates of the point of intersection?
- (A)  $(-1, -8)$  (B)  $(-3, -3)$   
 (C)  $(-1, -1)$  (D)  $(-1, -2)$
44. A focus of an ellipse is at the origin. The directrix is the line  $x = 4$  and the eccentricity is  $1/2$ . Then the length of the semi-major axis is
- (A)  $4/3$  (B)  $8/3$   
 (C)  $7/3$  (D)  $5/3$
45. A parabola has the origin as its focus and the line  $x = 2$  as the directrix. Then the vertex of the parabola is at
- (A)  $(0, 2)$  (B)  $(0, 1)$   
 (C)  $(1, 0)$  (D)  $(2, 0)$
46. One of the values of  $x$  in the determinant
- $$\begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix}$$
- is
- (A) 0 (B)  $a$   
 (C)  $b$  (D)  $c$
47. Let  $A$  be a  $2 \times 2$  matrix with real entries. Let  $I$  be the  $2 \times 2$  identity matrix. Denote by  $\text{tr}(A)$ , the sum of diagonal entries of  $A$ . Assume that  $A^2 = I$ .  
 Statement 1: If  $A \neq I$  and  $A \neq -I$ , then  $\det A = -1$ .  
 Statement 2: If  $A \neq I$  and  $A \neq -I$ , then  $\text{tr}(A) \neq 0$ .
- (A) Statement 1 is false, Statement 2 is true  
 (B) Statement 1 is true, Statement 2 is true, Statement 2 is a correct explanation for Statement 1  
 (C) Statement 1 is true, Statement 2 is true; Statement 2 is not a correct explanation for Statement 1  
 (D) Statement 1 is true, Statement 2 is false
48. If  $A^2 - A + I = 0$ , then the inverse of  $A$  is
- (A)  $A + I$  (B)  $A$   
 (C)  $A - I$  (D)  $I - A$



49. The system of equations  
 $ax + y + z = a - 1$ ,  
 $x + ay + z = a - 1$ ,  
 $x + y + az = a - 1$   
 has no solution, if  $a$  is
- (A)  $-2$  (B) either  $-2$  or  $1$   
 (C) not  $-2$  (D)  $1$
50. If  $1 \times 2 \times 3 \times 4 \times \dots \times n = n!$ , then the value of  $14! - 13! - 12!$  is equal to
- (A)  $14 \times 12 \times 13!$  (B)  $14 \times 12 \times 12!$   
 (C)  $13 \times 12 \times 12!$  (D)  $14 \times 13 \times 13$
51. The first, the second and the last term of G.P of  $n$  terms are equal to 3, 12 and 3072 respectively. Find  $n$ ?
- (A)  $n = 8$  (B)  $n = 6$   
 (C)  $n = 10$  (D)  $n = 12$
52. The first two terms of a geometric progression add up to 12. The sum of the third and the fourth terms is 48. If the terms of the geometric progression are alternately positive and negative, then the first term is
- (A)  $-2$  (B)  $-4$   
 (C)  $-12$  (D)  $8$
53. If  $n^{\text{th}}$  term of the sequence 9, 7, 5, .... is the same as the  $n$ th term of 15, 12, 9..., the value of  $n$  is
- (A) 7 (B) 8  
 (C) 9 (D) 5
54. If the sum of the roots of the quadratic equation  $ax^2 + bx + c = 0$  is equal to the sum of the squares of their reciprocals, then  $a/c$ ,  $b/a$  and  $c/b$  are in
- (A) arithmetic progression  
 (B) geometric progression  
 (C) harmonic progression  
 (D) arithmetic-geometric progression
55. If roots of the equation  $x^2 - bx + c = 0$  be two consecutive integers, then  $b^2 - 4c$  equals
- (A)  $-2$  (B) 3  
 (C) 2 (D) 1

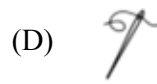
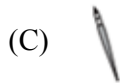
56. Differentiation of  $\log x \cdot \sin x$  gives
- (A)  $\sin x \cdot 1/x$  (B)  $\cos x \cdot \sin x + \log x$   
 (C)  $\sin x \cdot 1/x + \log x \cdot \cos x$  (D)  $\cos x \cdot (-1/x) + 1/\log x$
57. If  $x \frac{dy}{dx} = y(\log y - \log x + 1)$ , then the solution of the equation is
- (A)  $y \log(x/y) = cx$  (B)  $x \log(y/x) = cy$   
 (C)  $\log(x/y) = cx$  (D)  $\log(x/y) = cy$
58. The sum of ages of Sudha and her mother is 63 years. Four years back her mother's age was 4 times that of Sudha's age at that time. What is the present age in years of Sudha's mother?
- (A) 48 years (B) 46 years  
 (C) 42 years (D) None of the above
59. Reduce  $\frac{128352}{238368}$  to its lowest terms
- (A)  $3/4$  (B)  $5/13$   
 (C)  $7/13$  (D)  $9/13$
60. The ratio of two numbers is 3 : 4 and their H.C.F. is 4. Their L.C.M. is
- (A) 12 (B) 16  
 (C) 24 (D) 48
61. What is the exact value of the expression  $\sec\left(\cos^{-1}\left(\frac{-3}{4}\right)\right)$ ?
- (A)  $-\frac{4}{3}$  (B)  $\frac{\sqrt{7}}{4}$   
 (C)  $\frac{4}{3}$  (D)  $-\frac{\sqrt{7}}{4}$
62. An automobile passes city X at 9.55 A.M. and city Y at 10.15 A.M. City X is 30 miles from city Y. What is the average speed of the automobiles in miles per hour?
- (A) 10 (B) 30  
 (C) 90 (D) 120

63. What is the partial fraction decomposition of the rational expression  $\frac{3x}{(x-2)(x^2+1)}$ ?
- (A)  $\frac{6}{5(x-2)} - \frac{6x-3}{5(x^2+1)}$       (B)  $\frac{6}{(x-2)} + \frac{3x-2}{(x^2+1)}$   
 (C)  $\frac{2}{(x-2)} - \frac{6x-3}{(x^2+1)}$       (D)  $\frac{6}{5(x-2)} + \frac{6x+3}{5(x^2+1)}$
64. One half of the student body at school study French and one third of others study Tamil. The remaining 300 do not study Tamil or French. How many students are there in this school?
- (A) 360      (B) 550  
 (C) 900      (D) 1350
65. If  $f(x) = x^3 - 3x^2 + x$  and  $g$  is the inverse of  $f$ , then  $g'(3)$  is equal to
- (A) 10      (B)  $1/10$   
 (C) 1      (D) None of the above
66. Five horses are in a race. Mr. A selects two of the horses at random and bets on them. The probability that Mr. A selected the winning horse is
- (A)  $4/5$       (B)  $3/5$   
 (C)  $1/5$       (D)  $2/5$
67. The statement  $p \rightarrow (q \rightarrow p)$  is equivalent to
- (A)  $p \rightarrow (p \rightarrow q)$       (B)  $p \rightarrow (q \vee p)$   
 (C)  $p \rightarrow (q \wedge p)$       (D)  $p \rightarrow (q \leftrightarrow p)$
68. The banker's discount on a sum of money for 1 year is Rs. 558 and the true discount on the same sum for 2 years is Rs. 600. The rate percent is
- (A) 10%      (B) 13%  
 (C) 12%      (D) 15%
69. Let two numbers have arithmetic mean 9 and geometric mean 4. Then these numbers are the roots of the quadratic equation
- (A)  $x^2 + 18x + 16 = 0$       (B)  $x^2 - 18x - 16 = 0$   
 (C)  $x^2 + 18x - 16 = 0$       (D)  $x^2 - 18x + 16 = 0$

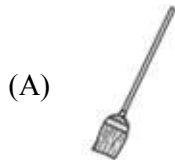
70. The value of  $\alpha$  for which the sum of the squares of the roots of the equation  $x^2 - (a-2)x - a - 1 = 0$ . The least value is
- (A) 1 (B) 0  
(C) 3 (D) 2
71. If  $x^3 + 5x^2 + 2$  is divided by  $x - 3$ , then the remainder is
- (A) 65 (B) 55  
(C) 45 (D) 2
72. Let  $f(x) = |x - 1|$ . Then
- (A)  $f(x^2) = [f(x)]^2$  (B)  $f(x + y) = f(x) + f(y)$   
(C)  $f(|x|) = |f(x)|$  (D) None of the above
73. If  $-2 < -\frac{1}{2}x < 4$ , then
- (A)  $4 > x > -8$  (B)  $4 < x > -8$   
(C)  $4 < x < -8$  (D)  $4 > x > -8$
74. ABCD is a trapezium in which  $AB \parallel DC$  and  $AB = 2CD$ . If its diagonals intersect each other at O, then the ratio of the areas of the triangles AOB and COD is
- (A) 1 : 2 (B) 1 : 4  
(C) 4 : 1 (D) 2 : 1
75. If  $f : A \rightarrow B$  is bijection, then
- (A)  $n(A) \leq n(B)$  (B)  $n(A) = n(B)$   
(C)  $n(A) \geq n(B)$  (D) None of the above

**Direction (Qn. Nos. 76 – 84):** For each questions, you will be presented with a set of two pictures that are related to each other in the same way. Along with this pair, you'll be given a third picture and four answer choices, which are also pictures. Of the four choices, choose the picture that would go in the empty box so that the two bottom pictures are related in the same way as the top two are related.

76.



77.



78.



(A)



(C)



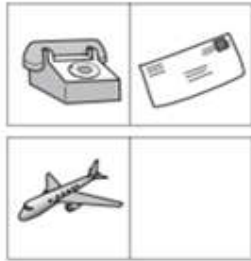
(B)



(D)



79.



(A)



(C)



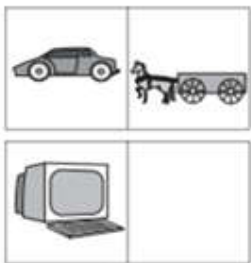
(B)



(D)



80.



(A)



(C)



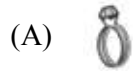
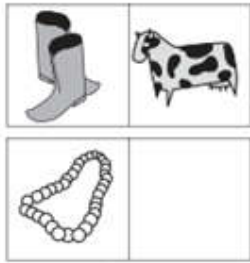
(B)



(D)



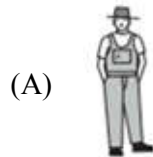
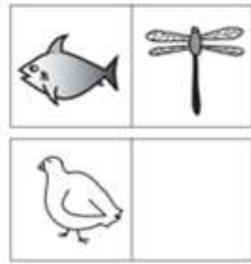
81.



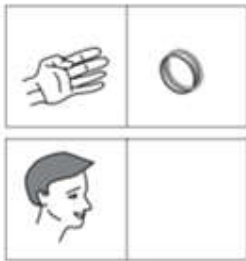
82.



83.



84.

85. By how much is  $\frac{3}{5}$ <sup>th</sup> of 80 smaller than  $\frac{4}{5}$ <sup>th</sup> of 65?

(A) 15

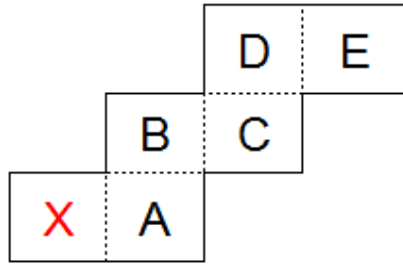
(B) 2

(C) 3

(D) 4



86. The figure shown below can be folded into the shape of a cube. In the resulting cube, which of the lettered faces is opposite the face marked X?



- (A) C  
(B) A  
(C) D  
(D) B
87. Identify the figure that completes the pattern.



- (A) 1  
(B) 2  
(C) 3  
(D) 4

**Direction (Qn. Nos. 88 – 90) :** First, you will be given a list of three "nonsense" words and their English word meanings. The question(s) that follow will ask you to reverse the process and translate an English word into an artificial language.

88. Here are some words translated from an artificial language.

*gorbflur* means fan belt

*pixngorbl* means ceiling fan

*arthtusl* means tile roof

Which word could mean "ceiling tile"?

- (A) gorbtusl  
(B) flurgorbl  
(C) arthflur  
(D) pixnarth

89. Here are some words translated from an artificial language.

*hapllesh* means cloudburst

*srenchoch* means pinball

*resbosrench* means ninepin

Which word could mean "cloud nine"?

- (A) leshsrench  
(B) ochhapl  
(C) haploch  
(D) hapresbo

90. Here are some words translated from an artificial language.  
*agnoscrenia* means poisonous spider  
*delanocrenia* means poisonous snake  
*agnosdeery* means brown spider  
 Which word could mean "black widow spider"?
- (A) deeryclostagnos (B) agnosdelano  
 (C) agnosvitribulunin (D) trymuttiagnos
91. If TOUR is written as 1234, CLEAR is written as 56784 and SPARE is written as 90847, find the code for CARE
- (A) 1247 (B) 4847  
 (C) 5247 (D) 5847
92. In a code language 35796 is written as 44887. Find the code for 46823.
- (A) 55914 (B) 57194  
 (C) 55934 (D) 55745
93. If BOY is coded as ACNPXZ, what will be the code for LIFE?
- (A) KMHJEGDF (B) LMGHEGDF  
 (C) LMHJGEFD (D) None of the above
94. Find the odd one out
- (A) Fish : Shoal (B) Cow : Herd  
 (C) Sheep : Flock (D) Man : Mob
95. 8% of the people eligible to vote are between 18 and 21 years of age. In an election, 85% of those eligible to vote, who were between 18 and 21, actually voted. In that election, the number of persons between 18 and 21, who actually voted, was what percent of those eligible to vote?
- (A) 4.2 (B) 6.8  
 (C) 6.4 (D) 8
96. Inland postal rates for letters are for the first 10 grams 50paise and 15paise for every additional 10 grams or part of it. If Sanjay wishes to send a letter weighing 27 grams, what will be the postal charges?
- (A) Rs 2.75 (B) Rs 2.60  
 (C) 80 paise (D) 65 paise

97. A shopkeeper fixes the marked price of an item 35% above its cost price. The percentage of discount allowed to gain 8% is:

- (A) 20% (B) 27%  
(C) 31% (D) 43%

98. A man has a job, which requires him to work 8 straight days and rest on the ninth day. If he started work on Monday, find the day of the week on which he gets his 12th rest day.

- (A) Thursday (B) Wednesday  
(C) Tuesday (D) Friday

**Direction (Qn. Nos. 99 – 103):** Fill in the blanks.

99. SCD, TEF, UGH, \_\_\_\_\_, WKL

- (A) CMN (B) UJI  
(C) VIJ (D) IJT

100.  $B_2CD$ , \_\_\_\_\_,  $BCD_4$ ,  $B_5CD$ ,  $BC_6D$

- (A)  $B_2C_2D$  (B)  $BC_3D$   
(C)  $B_2C_3D$  (D)  $BCD_7$

101. FAG, GAF, HAI, IAH, \_\_\_\_\_

- (A) JAK (B) HAL  
(C) HAK (D) JAI

102. ELFA, GLHA, ILJA, \_\_\_\_\_, MLNA

- (A) OLPA (B) KLMA  
(C) LLMA (D) KLLA

103. CMM, EOO, GQQ, \_\_\_\_\_, KUU

- (A) GRR (B) GSS  
(C) ISS (D) ITT

**Direction (Qn. Nos. 104 – 108):** In these series, you will be looking at both the letter pattern and the number pattern. Fill the blank with suitable answer.

104.  $ZA_5$ ,  $Y_4B$ ,  $XC_6$ ,  $W_3D$ , \_\_\_\_\_

- (A)  $E_7V$  (B)  $V_2E$   
(C)  $VE_5$  (D)  $VE_7$

105. JAK, KBL, LCM, MDN, \_\_\_\_\_
- (A) OEP (B) NEO  
(C) MEN (D) PFQ
106.  $P_5QR, P_4QS, P_3QT, \text{_____, } P_1QV$
- (A) PQW (B)  $PQV_2$   
(C)  $P_2QU$  (D)  $PQ_3U$
107. QAR, RAS, SAT, TAU, \_\_\_\_\_
- (A) UAV (B) UAT  
(C) TAS (D) TAT
108. DEF,  $DEF_2, DE_2F_2, \text{_____, } D_2E_2F_3$
- (A)  $DEF_3$  (B)  $D_3EF_3$   
(C)  $D_2E_3F$  (D)  $D_2E_2F_2$

**Direction (Qn. Nos. 109 -116) :** Each problem consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

109. Tanya is older than Eric.  
Cliff is older than Tanya.  
Eric is older than Cliff.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) uncertain (D) None of the above
110. Blueberries cost more than strawberries.  
Blueberries cost less than raspberries.  
Raspberries cost more than both strawberries and blueberries.  
If the first two statements are true, the third statement is
- (A) True (B) False  
(C) Uncertain (D) None of the above
111. All the trees in the park are flowering trees.  
Some of the trees in the park are dogwoods.  
All dogwoods in the park are flowering trees.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above

112. Mara runs faster than Gail.  
Lily runs faster than Mara.  
Gail runs faster than Lily.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above
113. The Kingston Mall has more stores than the Galleria.  
The Four Corners Mall has fewer stores than the Galleria.  
The Kingston Mall has more stores than the Four Corners Mall.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above
114. All the tulips in Zoe's garden are white.  
All the pansies in Zoe's garden are yellow.  
All the flowers in Zoe's garden are either white or yellow  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above
115. During the past year, Josh saw more movies than Stephen.  
Stephen saw fewer movies than Darren.  
Darren saw more movies than Josh.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above
116. Rover weighs less than Fido.  
Rover weighs more than Boomer.  
Of the three dogs, Boomer weighs the least.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None of the above

**Direction (Qn. Nos. 117 – 120):**

The logic problems in this set present you with three true statements: Fact 1, Fact 2, and Fact 3. Then, you are given three more statements (labeled I, II, and III), and you must determine which of these, if any, is also a fact. One or two of the statements could be true; all of the statements could be true; or none of the statements could be true. Choose your answer based solely on the information given in the first three facts.

117. Fact 1: All dogs like to run.  
Fact 2: Some dogs like to swim.  
Fact 3: Some dogs look like their masters.  
If the first three statements are facts, which of the following statements must also be a fact?
- I All dogs who like to swim look like their masters.  
II Dogs who like to swim also like to run.  
III Dogs who like to run do not look like their masters.
- (A) I only  
(B) II only  
(C) II and III only  
(D) None of the statements is a known fact
118. Fact 1: All drink mixes are beverages.  
Fact 2: All beverages are drinkable.  
Fact 3: Some beverages are red.  
If the first three statements are facts, which of the following statements must also be a fact?
- I Some drink mixes are red.  
II All beverages are drink mixes.  
III All red drink mixes are drinkable.
- (A) I and II only  
(B) II only  
(C) I and III only  
(D) III only
119. Fact 1: All chickens are birds.  
Fact 2: Some chickens are hens.  
Fact 3: Female birds lay eggs.  
If the first three statements are facts, which of the following statements must also be a fact?
- I All birds lay eggs.  
II Some Hens are birds.  
III Some chickens are not hens.
- (A) I only  
(B) II only  
(C) II and III only  
(D) None of the statements is a known fact

120. Fact 1: All hats have brims.  
Fact 2: There are black hats and blue hats.  
Fact 3: Baseball caps are hats.  
If the first three statements are facts, which of the following statements must also be a fact?
- I All caps have brims.  
II Some baseball caps are blue.  
III Baseball caps have no brims.
- (A) I only  
(B) II only  
(C) II and III only  
(D) None of the statements is a known fact
121. A four-person crew from Classic Colors is painting Mr. Field's house. Michael is painting the front of the house. Ross is in the alley behind the house painting the back. Jed is painting the window frames on the north side, Shawn is on the south. If Michael switches places with Jed, and Jed then switches places with Shawn, where is Shawn?
- (A) in the alley behind the house (B) on the north side of the house  
(C) in front of the house (D) on the south side of the house
122. In a four-day period Monday through Thursday each of the following temporary office workers worked only one day, each a different day. Ms. Johnson was scheduled to work on Monday, but she traded with Mr. Carter, who was originally scheduled to work on Wednesday. Ms. Falk traded with Mr. Kirk, who was originally scheduled to work on Thursday. After all the switching was done, who worked on Tuesday?
- (A) Mr. Carter (B) Ms. Falk  
(C) Ms. Johnson (D) Mr. Kirk
123. Four defensive football players are chasing the opposing wide receiver, who has the ball. Calvin is directly behind the ball carrier. Jenkins and Burton are side by side behind Calvin. Zeller is behind Jenkins and Burton. Calvin tries for the tackle but misses and falls. Burton trips. Which defensive player tackles the receiver?
- (A) Burton (B) Zeller  
(C) Jenkins (D) Calvin
124. Considering following pattern  $2 \times (2 + 2) = 8$ ,  $3 \times (3 + 2) = 15$ ,  $4 \times (4 + 2) = 24$ ,  $5 \times (5 + 2) = 35$ , 7<sup>th</sup> line in pattern will be
- (A)  $8 \times (8 + 2) = 80$  (B)  $9 \times (9 + 2) = 99$   
(C)  $8 \times (8 - 2) = 48$  (D)  $8 \times (8 + 4) = 96$
125. In following number sequence 40960, 10240, 2560, 640, next three numbers in sequence are
- (A) 300, 150, 50 (B) 200, 90, 10  
(C) 160, 40, 10 (D) 180, 60, 20

126. Considering following pattern  $2 \times (2 - 1) = 2$ ,  $3 \times (3 - 1) = 6$ ,  $4 \times (4 - 1) = 12$ ,  $5 \times (5 - 1) = 20$ , 8th line in pattern will be
- (A)  $9 \times (9 - 1) = 72$  (B)  $8 \times (8 - 1) = 56$   
 (C)  $7 \times (8 - 1) = 49$  (D)  $10 \times (10 - 1) = 90$
127. If following pattern is considered  $2^2 + 1 = 5$ ,  $3^2 + 1 = 10$ ,  $4^2 + 1 = 17$ ,  $5^2 + 1 = 26$ , ..... , then value of  $x$  in  $x^2 + 1 = 170$  will be
- (A) 12 (B) 15  
 (C) 14 (D) 13
128. In following sequence 79, 76, 73, 70, next three numbers in sequence are
- (A) 65, 62, 59 (B) 67, 64, 61  
 (C) 68, 65, 63 (D) 66, 63, 60
129. In following sequence 2, 10, 50, 250, next three numbers will be
- (A) 2000, 10500, 36000 (B) 1800, 6400, 32000  
 (C) 1500, 6500, 35000 (D) 1250, 6250, 31250
130. If following pattern is considered  $(2 + 2)^2/2 = 8$ ,  $(4 + 2)^2/2 = 18$ ,  $(6 + 2)^2/2 = 32$ ,  $(8 + 2)^2/2 = 50$ ,  $(10 + 2)^2/2 = 72$ , value of 'x' in pattern  $(x + 2)^2/2 = 200$  is
- (A) 18 (B) 20  
 (C) 22 (D) 24
131. In following sequence 2, 6, 10, 14, 18, next three numbers are
- (A) 22, 26, 30 (B) 24, 28, 32  
 (C) 26, 32, 38 (D) 22, 30, 40

**Direction (Qn. Nos. 132 – 138) :** Look at the following series and choose the best alternative.

132. F2, \_\_, D8, C16, B32, ...
- (A) A16 (B) G4  
 (C) E4 (D) E3
133. 664, 332, 340, 170, \_\_\_\_, 89, ...
- (A) 85 (B) 97  
 (C) 109 (D) 178



134. V, VIII, XI, XIV, \_\_, XX, ...
- (A) IX (B) XXIII  
(C) XV (D) XVII
135. 70, 71, 76, \_\_, 81, 86, 90, 91, ...
- (A) 70 (B) 71  
(C) 80 (D) 96
136. 4, 8, 16, 32, 64, \_\_
- (A) 48 (B) 52  
(C) 128 (D) 132
137. 2, 3, 5, 7, 11, 13, 17, 19, \_\_
- (A) 21 (B) 20  
(C) 23 (D) 22
138. 500, 475, 425, 350, 250, \_\_
- (A) 200 (B) 150  
(C) 100 (D) 125
139. Ms. Forest likes to let her students choose who their partners will be; however, no pair of students may work together more than seven class periods in a row. Adam and Baxter have studied together seven class periods in a row. Carter and Dennis have worked together three class periods in a row. Carter does not want to work with Adam. Who should be assigned to work with Baxter?
- (A) Carter (B) Adam  
(C) Dennis (D) Forest
140. All the offices on the 9th floor have wall-to-wall carpeting.  
No wall-to-wall carpeting is pink.  
None of the offices on the 9th floor has pink wall-to-wall carpeting.  
If the first two statements are true, the third statement is
- (A) true (B) false  
(C) Uncertain (D) None
141. Find the one which does not belong to the group?
- (A) 343 (B) 121  
(C) 1331 (D) 2197

142. Individual Objects in a set are called
- (A) element (B) set  
(C) list (D) None of above
143. Conversion of an octal number 1258 to its decimal number is
- (A)  $90_{10}$  (B)  $85_{10}$   
(C)  $87_{10}$  (D)  $99_{10}$
144. Considering following pattern  $2^2 + 1 = 5$ ,  $3^2 + 1 = 10$ ,  $4^2 + 1 = 17$ ,  $5^2 + 1 = 26$ ,  
....., 8<sup>th</sup> line in pattern is
- (A)  $7^2 + 1 = 50$  (B)  $9^2 + 1 = 82$   
(C)  $8^2 + 1 = 64$  (D)  $10^2 + 1 = 101$
145. If the  $\alpha$  and  $\beta$  are the roots of the equation  $4x^2 + 3x + 7 = 0$ , then find the value of  
( $1/\beta + 1/\alpha$ )
- (A)  $3/7$  (B)  $7/3$   
(C)  $-3/7$  (D)  $-7/3$
146. How much time will the leak take to empty the full cistern?
- I. The cistern is normally filled in 9 hours.  
II. It takes one hour more than the usual time to fill the cistern because of a leak in the bottom.
- (A) I alone sufficient while II alone not sufficient to answer  
(B) II alone sufficient while I alone not sufficient to answer  
(C) Either I or II alone sufficient to answer  
(D) Both I and II are necessary to answer
147. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is
- (A) 250 (B) 285  
(C) 280 (D) 276
148. Four people witnessed a mugging. Each gave a different description of the mugger. Which description is probably right?
- (A) He was average height, thin, and middle-aged  
(B) He was tall, thin, and middle-aged  
(C) He was tall, thin, and young  
(D) He was tall, of average weight, and middle-aged

149. I. Apartments in the Riverdale Manor cost less than apartments in The Gaslight Commons.  
II. Apartments in the Livingston Gate cost more than apartments in The Gaslight Commons.  
III. Of the three apartment buildings, the Livingston Gate costs the most.

If the first two statements are true, the third statement is

- (A) true (B) false  
(C) Uncertain (D) None of the above
150. BCB, DED, FGF, HIH, \_\_\_
- (A) JKJ (B) HJH  
(C) IJI (D) JHJ

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