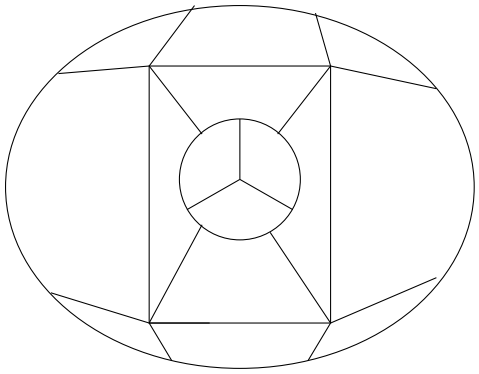
2024-DA-1-13

EE24BTECH11052 - RONGALI CHARAN

1) If ' → ' denotes increasing order of intensity, then the meaning of the words [sick → infirm → moribund] is analogous to [silly → _____ → daft].
Which one of the given options is appropriate to fill the blank?
   a) frown
   b) fawn
   c) vein
   d) vain

2) The 15 parts of the given figure are to be painted such that no two adjacent parts with shared boundaries (excluding corners) have the same color. The minimum number of colors required is:



   a) 4
   b) 3
   c) 5
   d) 6

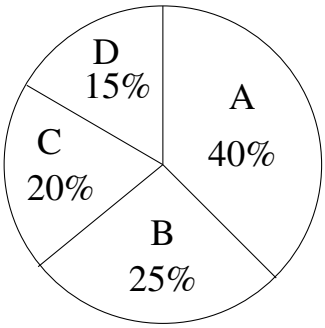
3) How many 4-digit positive integers divisible by 3 can be formed using only the digits {1, 3, 4, 6, 7}, such that no digit appears more than once in a number?
   a) 24
   b) 42
   c) 78
   d) 12

4) The sum of the following infinite series is

$$2+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{8}+\frac{1}{9}+\frac{1}{16}+\frac{1}{27}+\ldots$$

   a) $\frac{11}{3}$
   b) $\frac{7}{2}$
   c) $\frac{13}{4}$
   d) $\frac{9}{2}$

5) In an election, the share of valid votes received by the four candidates A, B, C, and D is represented by the pie chart shown. The total number of votes cast in the election were 1,15,000, out of which 5,000 were invalid.



Based on the data provided, the total number of valid votes received by the candidates B and C is:

a) 45,000
b) 49,500
c) 51,750
d) 54,000

6) Thousands of years ago, some people began dairy farming. This coincided with a number of mutations in a particular gene that resulted in these people developing the ability to digest dairy milk.// Based on the given passage, which of the following can be inferred?

a) All human beings can digest dairy milk.
b) No human being can digest dairy milk.
c) Digestion of dairy milk is essential for human beings.
d) In human beings, digestion of dairy milk resulted from a mutated gene.

7) The probability of a boy or a girl being born is $\frac{1}{2}$. For a family having only three children, what is the probability of having two girls and one boy?

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

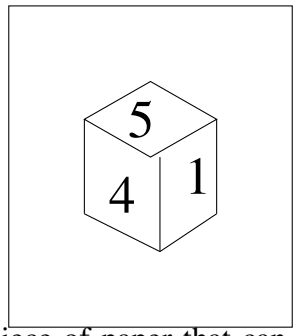
8) Person 1 and Person 2 invest in three mutual funds A, B, and C. The amounts they invest in each of these mutual funds are given in the table.

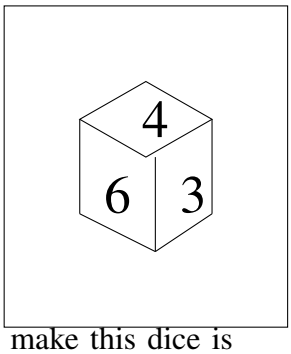
	Mutual fund A	**Mutual fund B**	**Mutual fund C**
Person 1	Rs.10, 000	Rs.20, 000	Rs.20, 000
Person 2	Rs.20, 000	Rs.15, 000	Rs.15, 000

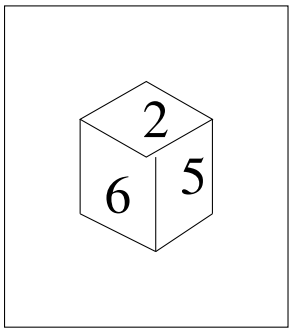
At the end of one year, the total amount that Person 1 gets is Rs.500 more than Person 2. The annual rate of return for the mutual funds B and C is 15% each. What is the annual rate of return for the mutual fund A?

a) 7.5%
b) 10%
c) 15%
d) 20%

9) Three different views of a dice are shown in the figure below.

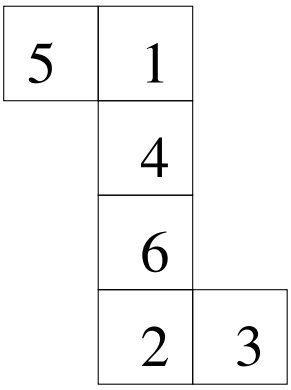




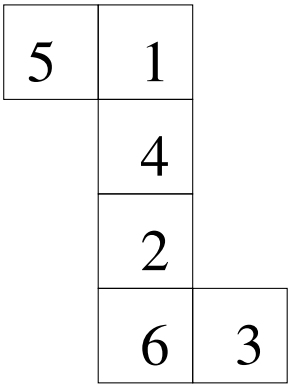


The piece of paper that can be folded to make this dice is

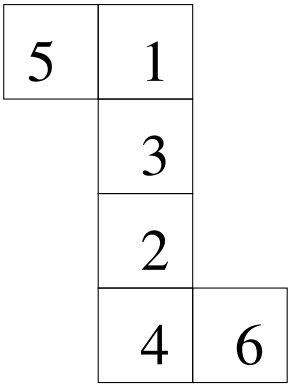
a)



b)



c)



d)

5	1	
	4	
	6	
	3	2

10) Visualize two identical right circular cones such that one is inverted over the other and they share a common circular base. If a cutting plane passes through the vertices of the assembled cones, what shape does the outer boundary of the resulting cross-section make?
   a) A rhombus
   b) A triangle
   c) An ellipse
   d) A hexagon

11) Consider the following statements:
   - (i) The mean and variance of a Poisson random variable are equal.
   - (ii) For a standard normal random variable, the mean is zero and the variance is one.

   Which ONE of the following options is correct?
   a) Both (i) and (ii) are true
   b) (i) is true and (ii) is false
   c) (ii) is true and (i) is false
   d) Both (i) and (ii) are false

12) Three fair coins are tossed independently. T is the event that two or more tosses result in heads. S is the event that two or more tosses result in tails. What is the probability of the event $T \cap S$?
   a) 0
   b) 0.5
   c) 0.25
   d) 1

13) Consider the matrix $\mathbf{M} = \begin{pmatrix} 2 & -1 \\ 3 & 1 \end{pmatrix}$
   Which ONE of the following statements is TRUE?
   a) The eigenvalues of **M** are non-negative and real.
   b) The eigenvalues of **M** are complex conjugate pairs.
   c) One eigenvalue of **M** is positive and real, and another eigenvalue of **M** is zero.
   d) One eigenvalue of **M** is non-negative and real, and another eigenvalue of **M** is negative and real.