CE : Civil Engineering

AI24BTECH11022 - Pabbuleti Venkata Charan Teja

1) You should _____ when to say _____. (2022)

a) no/no
b) no/know
c) know/know
d) know/no

2) Two straight lines pass through the origin $(x_0, y_0) = (0, 0)$. One of them passes through the point $(x_1, y_2) = (1, 3)$ and the other passes through the point $(x_2, y_2) = (1, 2)$. What is the area enclosed between the straight lines in the interval $[0, 1]$ on the $x-$axis? (2022)

a) 0.5
b) 1.0
c) 1.5
d) 2.0

3) If

$$p : q = 1 : 2$$

$$q : r = 4 : 3$$

$$r : s = 4 : 5$$

and u is 50% more than s, what is the ratio $p : u$? (2022)

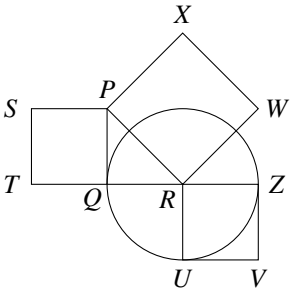
a) 2 : 15
b) 16 : 15
c) 1 : 5
d) 16 : 45

4) Given the statements:
P is the sister of Q.
Q is the husband of R.
R is the mother of S.
T is the husband of P.

Based on the above information, T is _____ of S. (2022)

a) the grandfather
b) an uncle
c) the father
d) a brother

5) In the following diagram, the point R is the center of the circle. The lines PQ and ZV are tangential to the circle. The relation among the areas of the squares, $PXWR$, $RUVZ$ and $SPQT$ is (2022)



a) Area of $SPQT$ =Area of $RUVZ$ =Area of $PXWR$
b) Area of $SPQT$ =Area of $PXWR$−Area of $RUVZ$
c) Area of $PXWR$ =Area of $SPQT$−Area of $RUVZ$
d) Area of $PXWR$ =Area of $RUVZ$−Area of $SPQT$

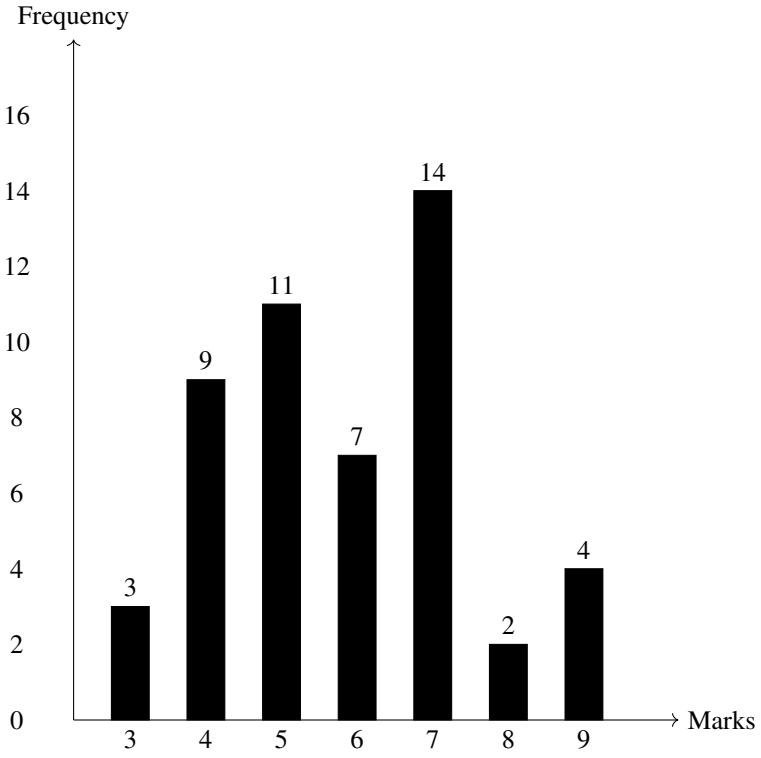
6) Healthy eating is a critical component of healthy aging. When should one start eating healthy? It turns out that it is never too early. For example, babies who start eating healthy in the first year are more likely to have better overall health as they get older. Which one of the following is the CORRECT logical inference based on the information in the above passage? (2022)

a) Healthy eating is important for those with good health conditions, but not for others
b) Eating healthy can be started at any age, earlier the better
c) Eating healthy and better overall health are more correlated at a young age, but not older age
d) Healthy eating is more important for adults than kids

7) P invested 5000 rupees per month for 6 months of a year and Q invested x rupees per month for 8 months of the year in a partnership business. The profit is shared in proportion to the total investment made in that year.
If at the end of that investment year, Q receives $\frac{4}{9}$ of the total profit, what is the value of x (in rupees)? (2022)

a) 2500
b) 3000
c) 4687
d) 8437

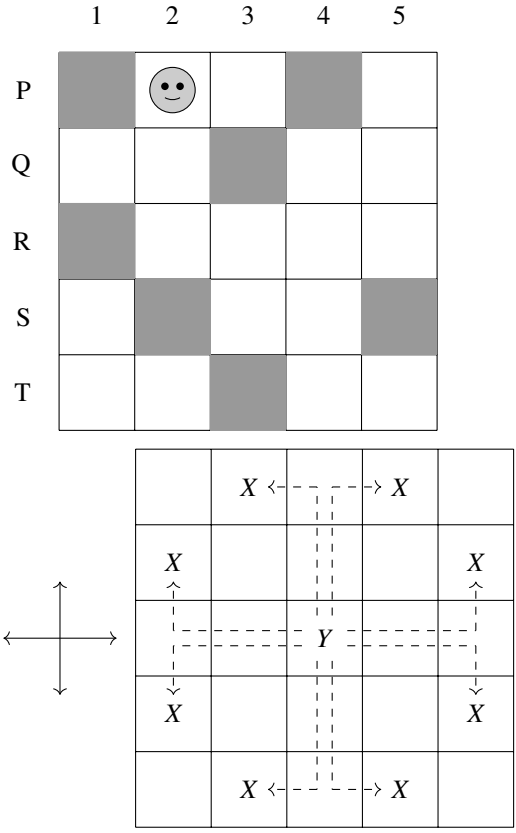
8)



The above frequency chart shows the frequency distribution of marks obtained by a set of students in an exam.
From the data presented above, which one of the following is CORRECT? (2022)

a) mean>mode>median
b) mode>median>mean
c) mode>mean>median
d) median>mode>mean

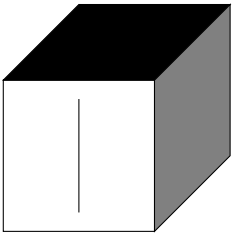
9) In the square grid shown on the left, a person standing at $P2$ position is required to move to $P5$ position.
The only movement allowed for a step involves, "two moves along one direction followed by one move in a perpendicular direction". The permissible directions for movement are shown as dotted arrows in the right.
For example, a person at a given position Y can move only to the positions marked X on the right.
Without occupying any of the shaded squares at the end of each step, the minimum number of steps required to go from $P2$ to $P5$ is (2022)



Example: Allowed steps for a person at Y

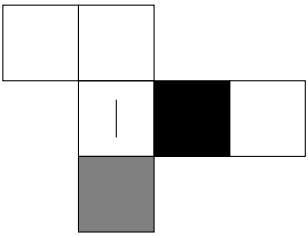
a) 4
b) 5
c) 6
d) 7

10)

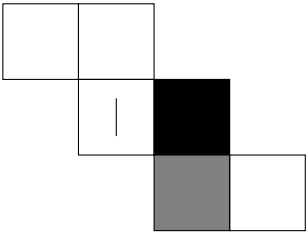


Consider a cube made by folding a single sheet of paper of appropriate shape. The interior faces of the cube are all blank. However, the exterior faces that are not visible in the above view may not be blank.
Which one of the following represents a possible unfolding of the cube? (2022)

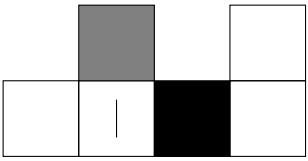
a)



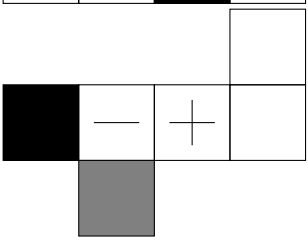
b)



c)



d)



11) Consider the following expression:

$$z = \sin(y + it) + \cos(y - it)$$

where z, y and t are variables, and $i = \sqrt{-1}$ is a complex number. The partial differential equation derived from the above expression is (2022)

a) $\frac{\partial^2 z}{\partial t^2} + \frac{\partial^2 z}{\partial y^2} = 0$
b) $\frac{\partial^2 z}{\partial t^2} - \frac{\partial^2 z}{\partial y^2} = 0$
c) $\frac{\partial z}{\partial t} - i\frac{\partial z}{\partial y} = 0$
d) $\frac{\partial z}{\partial t} + i\frac{\partial z}{\partial y} = 0$

12) For the equation

$$\frac{d^3y}{dx^3} + x\left(\frac{dy}{dx}\right)^{\frac{3}{2}} + x^2y = 0$$

the correct description is (2022)

a) an ordinary differential equation of order 3 and degree 2.
b) an ordinary differential equation of order 3 and degree 3.
c) an ordinary differential equation of order 2 and degree 3.
d) an ordinary differential equation of order 3 and degree $\frac{3}{2}$.

13) The hoop stress at a point on the surface of a thin cylindrical pressure vessel is computed to be $30.0MPa$. The value of maximum shear stress at this point is (2022)

a) $7.5MPa$
b) $15.0MPa$
c) $30.0MPa$
d) $22.5MPa$