TOTAL QUESTIONS-10, ***TIME – 10 MINUTES,*** ***MARKS –10***

MATH

1. If the square of the matrix $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is the unit matrix of order 2, then α, β and γ should satisfy the relation.
   (A) $1+\alpha^2+\beta\gamma=0$ (B) $1-\alpha^2-\beta\gamma=0$ (C) $1-\alpha^2+\beta\gamma=0$ (D) $1+\alpha^2-\beta\gamma=0$
2. Of the following the linear equation in one variable x, is
   (A) $\frac{4}{x}=\frac{x}{4}$ (B) $\frac{1}{x}+\frac{1}{x-1}=1$ (C) $\frac{x}{2}+\frac{x}{3}+\frac{1}{4}$ (D) $x^2+2x+3=0$
3. If $\frac{1}{2}$ is a root of the equation $x^2+kx-\frac{5}{4}=0$ then the value of k is
   (A) 2 (B) -2 (C) $\frac{1}{4}$ (D) $\frac{1}{2}$
4. The n^{th} term of an A.P. 5,2,-1,-4,-7….. is
   (a)2n +5 (B) 2n-5 (C) 8-3n (D) 3n-8
5. A cards is selected from a deck of 52 cards. The probability of its being a red face card is :
   (A) $\frac{3}{26}$ (B) $\frac{3}{13}$ (C) $\frac{2}{13}$ (D) $\frac{1}{2}$
6. A box contains 21 balls numbered 1 to 21. A ball is drawn and then another ball is drawn without replacement. What is the probability that both balls are even numbered ?
   (A) $\frac{2}{7}$ (B) $\frac{8}{21}$ (C) $\frac{3}{14}$ (D) $\frac{5}{21}$
7. For the following distribution

C.I.	0-5	6-11	12-17	18-23	24-29
F	26	20	30	16	22

   The upper limit of the median class is
   (A) 18.5 (B) 18 (C) 29.5 (D) 17.5
8. The distribution in which the values of median, mean and mode are not equal is considered as
   (A) experimental distribution (B) asymmetrical distribution
   (C) symmetrical distribution (D) exploratory distribution
9. Two right circular cylinders of the equal volume have their heights in the ratio 1:2. The ratio of their radii is :
   (A) $\sqrt{2}:1$ (B) 2:1 (C) 1:2 (D) 1:4
10. If the height of a given cone be doubled and readies of the base remains the same the ratio of the volume of the given cone to that of the seconds cone will be
    (A) 2:1 (B) 1:8 (C) 1:2 (D) 8:1

ANSWERS KEYS

1	B	6	C
2	C	7	C
3	A	8	B
4	C	9	A
5	A	10	C

EXPLANATION

1. B;

$$\text{Given}\begin{bmatrix}\alpha & \beta\\ \gamma & -\alpha\end{bmatrix}\begin{bmatrix}\alpha & \beta\\ \gamma & -\alpha\end{bmatrix}=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$$

$$\begin{bmatrix}\alpha^2+\beta\alpha & \alpha\beta-\alpha\beta\\ \alpha\gamma-\alpha\gamma & \beta\gamma+\alpha^2\end{bmatrix}=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$$

$$\begin{bmatrix}\alpha^2+\beta\gamma & 0\\ 0 & \alpha\gamma+\alpha^2\end{bmatrix}=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$$

$$\alpha^2-\beta\gamma=1$$

$$1-\alpha^2-\beta\gamma=0$$

2. C;
3. A;
4. C; Here a = 5, d = 2 – 5 = -3

   a_n = a+ (n-1) d =5+(n-1) (-3) = 5 – 3n +3n =8 -3n
5. A;
6. C; There are 10 even numbers in the group 1-21.

   $\therefore$ The probability that the first ball is even numbered $=\frac{10}{21}$

   Since the ball is not replaced there are now 20 balls left, of which 9 are even numbered.

   $\therefore$ The probability that the second ball is even numbered $=\frac{9}{20}$

   $\therefore$ Reqd. Probability $=\frac{10}{21}\times\frac{9}{20}=\frac{9}{42}=\frac{3}{14}$

   Hence option C is correct.
7. C;
8. B;
9. A;

$$V_1:V_2=1:1$$

$$\pi r_1^2h_1:\pi r_2^2h_2=1:1$$

$$\frac{r_2^2}{r_2^2}\times\frac{1}{2}=\frac{1}{1}$$

$$r_1:r_2=\sqrt{2}:1$$

10. C;

$$\frac{V_1}{V_2}=\frac{\frac{1}{3}\pi r_1^2h_1}{\frac{1}{3}\pi r_1^2 2h_1}=1:2$$

ALL THE POWER IS WITHIN YOU; YOU CAN DO ANYTHING AND EVERYTHING BELIEVE IN THAT; DON'T BELIEVE THAT YOU ARE WEAK. STAND UP AND EXPRESS THE DIVINITY WITHIN YOU"

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