# MODEL QUESTIONS – MATHEMATICS

1) I) The coefficient of $x^5$ in $(1-x-x^2+x^3)^6$ is 20.
II) If p and q are the coefficients of $x^4$ in $(1+x)^{2n}$ and $(1+x)^{2n-1}$ respectively then 2p=q.
Which of the above statements is (are) true.

1) only I 2) Only II 3) Both I and II 4) Neither I nor II

2). Assertion (A): If A+B=45° then (1+TanA)(1+TanB)=2.
Reason(R): Tan 22 ½ ° = $\sqrt{2}-1$.

1) Both A & R are True and R is the correct explanation of A.
2) Both A & R are True and R is not correct explanation of A.
3) A is True but R is False.
4) R is True but A is False.

3) Arrange the following statements in ascending order of their results
A) The order of $\frac{d^4y}{dx^4}+\frac{d^2y}{dx^2}=a\left(\frac{d^3y}{dx^3}\right)^{3/2}$
B) The degree of $\frac{dy}{dx}+\frac{d^2y}{dx^2}=a\left(\frac{d^3y}{dx^3}\right)^{5/4}$
C) The degree of $y=\left(1+\left(\frac{dy}{dx}\right)^2\right)^{3/2}\left(\frac{d^2y}{dx^2}\right)$
D) The order of $x^3+\left(\frac{d^3y}{dx^3}\right)^2+2x^2\left(\frac{d^2y}{dx^2}\right)-3y=x^2$

1) D,C,B,A 2) D,C,A,B 3) C,D,B,A 4) C,D,A,B

4) A and B are two independent events of a sample space such that P(A)=0.2, P(B)=0.5.

| List I | List II |
|---|---|
| A) P(B/A) | I) 0.2 |
| B) P(A/B) | II) 0.1 |
| C) P(A ∩ B) | III) 0.3 |
| D) P(A ∪ B) | IV) 0.6 |
| | V) 0.5 |

The correct match is
1) A-IV, B-V, C-III, D-I
2) A-V, B-I, C-II, D-IV
3) A-III, B-I, C-II, D- IV
4) A-II, B-I, C-IV, D-V

5) The line $ax+by+c=0$ is a normal to the circle $x^2+y^2+4x+6y+8=0$ if and only if

(1) $2a+3b=c$ (2) $3a+2b=c$ (3) $2a+3b+c=0$ (4) $3a+2b+c=0$

6) $\begin{vmatrix} al & bm & cn \\ l^2 & m^2 & n^2 \\ 1 & 1 & 1 \end{vmatrix} = \Delta_1$ and $\begin{vmatrix} a & b & c \\ l & m & n \\ mn & ln & lm \end{vmatrix} = \Delta_2$ then

(1) $\Delta_1 = \Delta_2$ (2) $\Delta_1 = 2\Delta_2$ (3) $2\Delta_1 = \Delta_2$ (4) $\Delta_1 + \Delta_2 = 0$

7) If $\bar{a}$ is a non-zero vector and $\bar{b}$, $\bar{c}$ are two vectors such that $\bar{a} \times \bar{b} = \bar{a} \times \bar{c}$ and $\bar{a} \cdot \bar{b} = \bar{a} \cdot \bar{c}$ then

1) $\bar{b} - \bar{c}$ is collinear with $\bar{a}$ 2) $\bar{b} - \bar{c}$ is perpendicular with $\bar{a}$

3) $\bar{b} = \bar{c}$ 4) $\bar{b} \neq \bar{c}$

8) If $L_1 : 2x + 3y - 20 = 0$, $L_2 : 2x + 3y - 14 = 0$,
then the straight line represented by $a(2x + 3y - 20) + b(2x + 3y - 14) = 0$ is

1) Parallel to $L_1 = 0$ and $L_2 = 0$.
2) Perpendicular to $L_1 = 0$ and parallel to $L_2 = 0$
3) Perpendicular to $L_1 = 0$ and $L_2 = 0$
4) Parallel to $L_1 = 0$ and Perpendicular to $L_2 = 0$

9) If $f(x) = log\left(\frac{1+2x}{1-2x}\right)$, then $x =$

1) $\frac{e^{f(x)}-1}{2(e^{f(x)}+1)}$ 2) $\frac{2(e^{f(x)}-1)}{(e^{f(x)}+1)}$ 3) $\frac{e^{f(x)}-1}{(e^{f(x)}+1)}$ 4) $\frac{e^{f(2x)}-1}{(e^{f(2x)}+1)}$

10) If $tan\theta = \frac{b}{a}$ then $a\,cos2\theta - bsin2\theta =$

1) $a$ 2) $b$ 3) $2a$ 4) $2b$

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