Q1. 21 January Shift 1

If the coefficient of x in the expansion of $\left(ax^2+bx+c\right)(1-2x)^{26}$ is -56 and the coefficients of x^2 and x^3 are both zero, then $\mathrm{a}+\mathrm{b}+\mathrm{c}$ is equal to :

(1) 1500 (2) 1300 (3) 1403 (4) 1483

Q2. 21 January Shift 2

If $\left(\frac{1}{{}^{15}\mathrm{C}_0}+\frac{1}{{}^{15}\mathrm{C}_1}\right)\left(\frac{1}{{}^{15}\mathrm{C}_1}+\frac{1}{{}^{15}\mathrm{C}_2}\right)\cdots\left(\frac{1}{{}^{15}\mathrm{C}_{12}}+\frac{1}{{}^{15}\mathrm{C}_{13}}\right)=\frac{\alpha^{13}}{{}^{14}\mathrm{C}_0{}^{14}\mathrm{C}_1\cdots{}^{14}\mathrm{C}_{12}}$, then 30α is equal to _____.

Q3. 22 January Shift 1

The coefficient of x^{48} in $(1+x)+2(1+x)^2+3(1+x)^3+\ldots+100(1+x)^{100}$ is equal to

(1) $100\cdot{}^{100}\mathrm{C}_{49}-{}^{100}\mathrm{C}_{48}$ (2) ${}^{100}\mathrm{C}_{50}+{}^{101}\mathrm{C}_{49}$

(3) $100\cdot{}^{101}\mathrm{C}_{49}-{}^{101}\mathrm{C}_{50}$ (4) $100\cdot{}^{100}\mathrm{C}_{49}-{}^{100}\mathrm{C}_{50}$

Q4. 22 January Shift 2

Let C_r denote the coefficient of x^r in the binomial expansion of $(1+x)^\mathrm{n}, \mathrm{n}\in\mathrm{N}, 0\leq\mathrm{r}\leq\mathrm{n}$. If $P_n=C_0-C_1+\frac{2^2}{3}C_2-\frac{2^3}{4}C_3+\ldots..+\frac{(-2)^n}{n+1}C_n$, then the value of $\sum_{n=1}^{25}\frac{1}{P_{2n}}$ equals.

(1) 650 (2) 675 (3) 525 (4) 580

Q5. 23 January Shift 1

The value of $\frac{{}^{100}\mathrm{C}_{50}}{51}+\frac{{}^{100}\mathrm{C}_{51}}{52}+\ldots+\frac{{}^{100}\mathrm{C}_{100}}{101}$ is :

(1) $\frac{2^{101}}{100}$ (2) $\frac{2^{100}}{100}$ (3) $\frac{2^{101}}{101}$ (4) $\frac{2^{100}}{101}$

Q6. 23 January Shift 1

The sum of all possible values of $\mathrm{n}\in\mathbf{N}$, so that the coefficients of x, x^2 and x^3 in the expansion of $\left(1+x^2\right)^2(1+x)^\mathrm{n}$, are in arithmetic progression is :

(1) 12 (2) 7 (3) 3 (4) 9

Q7. 24 January Shift 1

Let $\mathrm{S}=\frac{1}{25!}+\frac{1}{3!23!}+\frac{1}{5!21!}+\ldots$ up to 13 terms. If $13\,\mathrm{S}=\frac{2^k}{n!}, k\in\mathrm{N}$, then $n+k$ is equal to

(1) 50 (2) 49 (3) 52 (4) 51

Q8. 28 January Shift 2

Given below are two statements :

Statement I: $25^{13}+20^{13}+8^{13}+3^{13}$ is divisible by 7.

Statement II: The integral part of $(7+4\sqrt{3})^{25}$ is an odd number.

In the light of the above statements, choose the correct answer from the options given below :

(1) Statement I is true but Statement II is false
(2) Both Statement I and Statement II are true
(3) Statement I is false but Statement II is true
(4) Both Statement I and Statement II are false

Q9. 28 January Shift 2

The sum of the coefficients of x^{499} and x^{500} in $(1+x)^{1000}+x(1+x)^{999}+x^2(1+x)^{998}+\ldots+x^{1000}$ is :

(1) ${}^{1002}C_{500}$
(2) ${}^{1002}C_{501}$
(3) ${}^{1001}C_{501}$
(4) ${}^{1000}C_{501}$

ANSWER KEYS

1. (3) **2.** 32 **3.** (3) **4.** (2) **5.** (2) **6.** (4) **7.** (2) **8.** (2)
9. (1)