Q01. Let A and B be two sets. Then $(A\cup B)^c\cup(A^c\cap B)=$

a) A^c b) B^c c) A d) None

Q02. If $A=\{x,y\}$ then power set of A is

a) $\{x^y,y^x\}$ b) $\{\phi,x,y\}$ c) $\{\phi,\{x\},\{2y\}\}$ d) None

Q03. Let $Y=\{1,2,3,4,5\}$, $A=\{1,2\}$, $B=\{3,4,5\}$ and ϕ denote null set. Then $(Y\times A)\cap(Y\times B)$

a) Y b) A c) B d) ϕ

Q04. $\sum_{n=1}^{13}\left(i^n+i^{n+1}\right)$ equals

a) i b) $i-1$ c) $-i$ d) $1-i$

Q05. The conjugate of a complex number is $\frac{1}{i-1}$. Then the complex number is

a) $-\frac{1}{i-1}$ b) $\frac{1}{1+i}$ c) $-\frac{1}{1+i}$ d) $1-i$

Q06. The smallest positive integer m for which $\frac{(1+i)^m}{(1-i)^{m-2}}$ is a real number, is

a) 1 b) 2 c) 3 d) 4

Q07. First two terms of a GP add up to 12. The sum of third and fourth terms is 48. If the terms of GP are alternatively positive and negative, then the first terms is

a) 12 b) 4 c) –4 d) –12

Q08. If A_1, A_2 be two AM's and G_1, G_2 be two GM's between a and b, then $\frac{A_1+A_2}{G_1G_2}$ is

a) $\frac{a+b}{2ab}$ b) $\frac{2ab}{a+b}$ c) $\frac{a+b}{ab}$ d) $\frac{a+b}{\sqrt{ab}}$

Q09. If AM of two nos. is twice their GM, then ratio of the greatest number to the smallest is

a) $\left(7+4\sqrt{3}\right):1$ b) $\left(7-4\sqrt{3}\right):1$ c) $21:1$ d) $1:21$

Q10. The value of $2^{1/4}.4^{1/8}.8^{1/16}.16^{1/32}\ldots$ is

a) $\frac{3}{2}$ b) $\frac{5}{2}$ c) 1 d) 2

Q11. The value of $1.1!+2.2!+3.3!+\ldots+n.n!$ is

a) $(n+1)!$ b) $(n+1)!+1$ c) $(n+1)!-1$ d) None

Q12. There are 12 True-False questions in an examination. The number of ways in which these questions can be answered, is

a) 240 b) 1024 c) 2048 d) 4096

Q13. If the letters of word SACHIN are arranged in all possible ways and are written out as in a dictionary, then the word SACHIN appears at serial number

a) 600 b) 601 c) 602 d) 603

Q14. Total number of different 9 digit numbers that can be formed from the number 223355888 by rearranging its digits so that the odd digits occupy even places, is

a) 60 b) 16 c) 36 d) 180

Q15. The coefficient of x^{100} in the expansion of $\sum_{n=0}^{200}(1+x)^n$ is

a) $\frac{200}{101}$ b) $\frac{201}{100}$ c) $\frac{201}{101}$ d) $\frac{200}{110}$

Q16. The coefficient of x^4 in the expansion of $\left(\frac{x}{2}-\frac{3}{x^2}\right)^{10}$ is

a) $\frac{405}{256}$ b) $\frac{450}{265}$ c) $\frac{504}{256}$ d) None

Q17. Three numbers are chosen from 1 to 30. The probability that they are not consecutive is

a) $\frac{142}{145}$ b) $\frac{1}{145}$ c) $\frac{143}{145}$ d) $\frac{144}{145}$

Q18. 'X' speaks truth in 60% and 'Y' in 50% of the cases. The probability that they contradict each other while narrating the same incident, is

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

Q19. If the lines $2x+3y+1=0$ and $3x-y=4$ lie along diameters of a circle of circumference 10π, then the equation of this circle is

a) $x^2+y^2+2x-2y=23$ b) $x^2+y^2-2x-2y=23$

c) $x^2+y^2+2x+2y=23$ d) $x^2+y^2-2x+2y=23$

Q20. The equation of a parabola having focus at $(3,0)$ and the directrix $x+3=0$ is

a) $y^2=12x$ b) $y^2=-12x$ c) $x^2=12y$ d) None

Q21. The number of solutions of the equation $3\sin^2x-7\sin x+2=0$ in the interval $[0,5\pi]$, is

a) 0 b) 5 c) 6 d) 10

Q22. If $y=\sin^2\theta+\cos^4\theta$, then for all real values of θ, $y\in$

a) $[1,2]$ b) $\left[\frac{13}{16},1\right]$ c) $\left[\frac{3}{4},\frac{13}{16}\right]$ d) $\left[\frac{3}{4},1\right]$

Q23. The value of $\lim_{x\to0}\frac{\sqrt{\frac{1}{2}(1-\cos2x)}}{x}$ is

a) -1 b) 1 c) 0 d) non-existent

Q24. The value of $f'(\tan2x)$ is

a) $\sec^2 2x$ b) $2\sec^2 2x$ c) $\sec^2 x$ d) $2\sec^2 x$

Q25. If for non-zero x, $\alpha f(x)+\beta f\left(\frac{1}{x}\right)=\frac{1}{x}-5$ where $\alpha\neq\beta$, then $f(2)=$

a) $\frac{3(2\beta+3\alpha)}{2(\alpha^2-\beta^2)}$ b) $\frac{3(2\beta-3\alpha)}{2(\alpha^2-\beta^2)}$ c) $\frac{6}{\alpha+\beta}$ d) None