Sr. Inter MATHS IIA MODEL PAPER-1

Very Short Answer Type Questions . Answer all Questions. 10x 2 = 20 M

Each Question carries two marks.

1) Find the square root of $-5+12i$

2) Express $z=-\sqrt{7}+i\sqrt{21}$ in the polar form

3) If $(m+1)x^2+2(m+3)x+(m+8)=0$ has equal roots. Find m

4) Show that $2x^3+x^2+5x+2=0$ is a reciprocal equation of class one

5) Find the value of $(1-i)^8$

6) Find the number of positive divisors of 1080

7) If ${}^9C_3+{}^9C_5={}^{10}C_r$, then find r.

8) Find the mean deviation from the mean of the following distribution: 3,9,2,8,7,1,7,7,3.

9) Find the number of term in the expansion of

$(2x+3y+z)^7$

10) On an average rain falls on 12 days in every 30 days. Find the probability that rain falls on just 3 days of given seven days.

Section-B

Short Answer Type Questions. Answer any 'FIVE' Questions.

Each Question carries 'Four' marks. 5 x 4 = 20 M

11) If $\frac{z_2}{z_1}, z_1 \neq 0$ is an imaginary number then find the value of $\left|\frac{2z_1+z_2}{2z_1-z_2}\right|$

12) Find the range of the expression $\frac{x+2}{2x^2+3x+6}$ *if* $x \in R$

13) Find the number of ways of selecting a cricket team of 11 players from 7 batsmen and 6 bowlers such that there will be at least 5 bowlers in team ?

14) If the letters of the word MASTER are permuted in all possible ways and words thus formed an arranged in the dictionary order, then find the rank of the word **REMAST**

15) Resolve into partial fractions of $\frac{x^4}{(x-1)^2(x+1)^2}$

16) State and prove multiplication theorem on probability?

17) A,B,C are three horses in a race. The probability of A to win the race is twice that of B, and probability of B is twice that of 'C', what are the probabilities of A,B and C to win the race.

18.If $(x+iy)^{1/3}=a+ib,$ then P .T $\frac{x}{a}+\frac{y}{b}=4(a^2-b^2)$

19.Resolve into partial fractions. $\frac{x^2-3}{(x+2)(x^2+1)}$

20. Solve $x^3-7x^2+14x-8=0$. Given that the roots are in geometric progression

Section-C

Long Answer Type Questions. Answer any 'FIVE' Question.
Each Question carries 'SEVEN' marks. **5 x 7 = 35 M**

21.If $a,b,c\in R$ and $a\neq 0$. Then prove thatthe roots of $ax^2+bx+c=0$ are non real complex numbers if and only if ax^2+bx+c and a have the same sign for all $x\in R$

22) If α,β are the roots of the equation $x^2-2x+4=0$ then for any $n\in N$ show that $\alpha^n+\beta^n=2^{n+1}\cos\left(\frac{n\pi}{3}\right)$

23) Solve $6x^6-25x^5+31x^4-31x^2+25x-6=0$

24) Solve $x^4+4x^3-2x^2-12x+9=0$, given that it has two pairs of equation roots.

25) Prove that $\frac{{}^{4n}C_{2n}}{{}^{2n}C_n}=\frac{1.3.5...(4n-1)}{\{1.3.5...(2n-1)\}^2}$

26)Find the term independent of x in the expansion of $\left(\frac{\sqrt{x}}{3}+\frac{3}{2x^2}\right)^{10}$

27)In a shooting test the probability of A, B, C hitting the targets are $\frac{1}{2},\frac{2}{3}$ and $\frac{3}{4}$ respectively.
If all of them fire at the same target, Find the probability that
(i) only one of them hits the target, (ii) at least one of them hits the target.

28).Three screws are drawn at random from a lot of 50 screws, 5 of which are defective. Find the probability of the event that all 3 screws are non-defective, assuming that the drawing is
a) with replacement b) without replacement

29) The probability distribution of a random variable X is given below

X=x	1	2	3	4	5
$P(X=x)$	K	2K	3K	4K	5K

i)Find the value of K. ii) mean and variance of X.

30).If the mean and variance of a binomial variable X are 2.4 and 1.44 respectively, find $P(1<X\leq 4)$.