MS JUNIOR COLLEGE

Hyderabad

GUESS PAPER - 2

INTERMEDIATE 2nd YEAR

Time: 3hours MATHEMATICS- IIA **Max.Marks:75**

I. i) Very Short Answer Type Questions. **(10 x 2 = 20)**
ii) Answer **ALL** questions.
iii) Each question carriers **TWO** marks.

1. Find the Squares root of $7 + 24i$.
2. Express -1- $\sqrt{3i}$ in modulus - amplitude form.
3. If the cube roots of unity are 1, ω, ω^2, then find the roots of the equation $(x - 1)^3 + 8 = 0$.
4. Find the quadratic equation, the sum of whose roots is 7 and the sum of the squares of the roots is 25.
5. If the product of roots of $4x^3 + 16x^2 - 9x - a = 0$ is 9 then find a.
6. Find the number of palindromes with 6 digits that can be formed using the digits 1, 3, 5, 7, 9.
7. Find the number of positive divisors of 1080.
8. If the coefficients of $(2r + 4)^{th}$ term and $(3r + 4)^{th}$ term in the expansion of $(1 + x)^{21}$ are equal, then find r.
9. Find the variance of the data 5, 12, 3, 18, 6, 8, 2, 10.
10. The range of a random variable X is {1, 2, 3, ..., ∞} and $P(X = k) = \frac{c^k}{k!}$; k = 1, 2, 3, ..., ∞, find c.

II. i) Short Answer Type Questions. **(5 x 4 = 20)**
ii) Answer any **FIVE** questions.
iii) Each question carriers **FOUR** marks.

11. If the amplitude of $\left(\frac{z-2}{z-6i}\right) = \frac{\pi}{2}$, find its locus.
12. Solve the equation $\sqrt{\frac{3x}{x+1}} + \sqrt{\frac{x+1}{3x}} = 2$.
13. Find the number of ways of arranging 5 different mathematics books, 4 different physics books and 3 different chemistry books such that the books of the same subject are together.
14. Show that $\frac{^{4n}C_{2n}}{^{2n}C_n} = \frac{1.3.5.....(4n-1)}{\{1.3.....(2n-1)\}^2}$.
15. Resolve into partial fractions $\frac{x^4}{(x-1)(x-2)}$.
16. A speaks truth in 75% of the cases and B in 80% of the cases. What is the probability that their statements about an incident do not match.
17. A, B are two independent events such that the probability of both the events to occur is 1/6 and the probability of both the events do not occur is 1/3. Find P(A).

III. i) Long Answer Type Questions. **(5 x 7 = 35)**

ii) Answer any **FIVE** questions.

iii) Each question carriers **SEVEN** marks.

18. Find all the roots of the equation $x^9 - x^5 + x^4 - 1 = 0$.

19. Solve the equation $x^4 + 4x^3 - 2x^2 - 12x + 9 = 0$, if it has a pair of equal roots.

20. Prove that $C_0C_r + C_1C_{r+1} + C_2C_{r+2} + ... + C_{n-r}C_n = {}^{2n}C_{n+r}$.

Deduce that i) $C_0^2 + C_1^2 + C_2^2 + ... + C_n^2 = {}^{2n}C_n$. ii) $C_0C_1 + C_1C_2 + + C_2C_3 + ... + C_{n-1}C_n = {}^{2n}C_{n+1}$.

21. If $|x|$ is so small that x^2 and higher powers of x may be neglected, then find approximate value of

$$\frac{\left(1-\frac{2x}{3}\right)^{\frac{3}{2}}(32+5x)^{\frac{1}{5}}}{(3-x)^3}.$$

22. Find the mean deviation from the median of the following data.

Age (Years)	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
No. of workers (f_i)	120	125	175	160	150	140	100	30

23. Three boxes numbered I, II, III contain 1 white, 2 black and 3 red balls; 2 white, 1 black and 1 red ball; 4 white, 5 black and 3 red balls respectively. One box is randomly selected and a ball is drawn from it. If the ball is red then find the probability that it is from box II.

24. The range of a random variable X is {0, 1, 2}. Given that $P(X = 0) = 3C^3$, $P(X = 1) = 4C - 10C^2$, $P(X = 2) = 5C - 1$. Find (i) the value of C (ii) $P(X < 1)$ (iii) $P(1 < X \leq 2)$ (iv) $P(0 < X \leq 3)$.

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