Telangana Board

2024 Question Papers







0266

C

Total No. of Questions: 24
Total No. of Printed Pages: 3

Regd. No.

MATHEMATICS

Paper – II (A)

(English Version)

Time : 3 Hours **Max. Marks : 75**

Instructions to candidate: This Question paper consists of **three** sections – A, B and C.

SECTION – A

(10 × 2 = 20)

I. Very short answer type questions:

(i) Answer **all** questions.

(ii) Each question carries **two** marks.

1. Find the square root of $(-5 + 12i)$.
2. If $z_1 = -1$, $z_2 = -i$ then find Arg $(z_1 . z_2)$.
3. Simplify $\left(\frac{(\cos\alpha + i\sin\alpha)^4}{(\sin\beta + i\cos\beta)^8}\right)$.
4. If $x^2 - 6x + 5 = 0$ and $x^2 - 3ax + 35 = 0$ have a common root, then find
5. If 1, 1, α are the roots of $x^3 - 6x^2 + 9x - 4 = 0$ then find α.
6. If $^{12}P_5 + 5.\ ^{12}P_4 = {}^{13}P_r$, find r.
7. If $^nC_5 = {}^nC_6$ then find $^{13}C_n$.
8. Write down and simplify the 7^{th} term in $(3x - 4y)^{10}$.
9. Find the mean deviation from the mean of the following discrete
   6, 7, 10, 12, 13, 4, 12, 16.
10. If the mean and variance of the binomial variable x are 2.4 a
    respectively, find p $(1 < x \leq 4)$.

(ii) Each question

11. Show that $\frac{2-i}{(1-2i)^2}$ and $\frac{-2-11i}{25}$ are conjugate to each other.

12. Determine the range of the following expression $\frac{x^2+x+1}{x^2-x+1}$, $x \in R$.

13. Find the sum of all 4-digit numbers that can be formed using the digits 1, 3, 5, 7, 9.

14. 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 the team.

15. Resolve the following fraction into partial fractions: $\frac{5x+6}{(2+x)(1-x)}$.

16. If A and B are two events with $P(A \cup B) = 0.65$ and $P(A \cap B) = 0.15$ then find the value of $P(A^c) + P(B^c)$.

17. A problem in calculus is given to two students A and B whose chances of solving it are $\frac{1}{3}$ and $\frac{1}{4}$ respectively. Find the probability of the problem being solved if both of them try independently.

SECTION – C (5 × 7 = 35)

III. Long Answer type questions:

(i) Answer any **five** questions.

(ii) Each question carries **seven** marks.

18. Show that one value of $\left(\frac{1+\sin\frac{\pi}{8}+i\cos\frac{\pi}{8}}{1+\sin\frac{\pi}{8}-i\cos\frac{\pi}{8}}\right)^{8/3}$ is -1.

19. Solve the following equation $x^4 - 10x^3 + 26x^2 - 10x + 1 = 0$.

20. If P and Q are the sum of odd terms and the sum of even terms respectively in the expansion of $(x + a)^n$ then prove that

(i) $P^2 - Q^2 = (x^2 - a^2)^n$

(ii) $4PQ = (x + a)^{2n} - (x - a)^{2n}$.

21. If $x = \frac{1.3}{3.6} + \frac{1.3.5}{3.6.9} + \frac{1.3.5.7}{3.6.9.12} + \ldots\ldots\alpha$ then prove that $9x^2 + 24x = 11$.

22. Find the mean deviation from the mean for a continuous frequency distribution.

Sales (in Rs. thousand)	40-50	50-60	60-70	70-80	80-90	90-100
Number of companies	5	15	25	30	20	5

23. State and prove "Addition theorem on probability".

24. The range of a random variable X is { 0, 1, 2 }. Given that $P(x = 0) = 3c^3$, $P(x = 1) = 4c - 10c^2$, $P(x = 2) = 5c - 1$

(i) Find the value of c and

(ii) $P(x < 1)$, $P(1 < x \leq 2)$, $P(0 < x \leq 3)$.

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