



Date: 14 /11/23
GRADE: XI


MONTHLY TEST -02 (2023-24)
MATHEMATICS [041] -MS

Max marks: 20
Time: 50 Minutes

General Instructions:

- 1) Questions 1 to 4 carries 1 mark each.
- 2) Questions 5 to 8 carries 2 marks each.
- 3) Questions 9 and 10 carries 4 marks each.
- 4) All questions are compulsory.

SECTION A		
1	How many different signals can be given with 5 different flags by hoisting all at a time? a) 325 b) 120 c) 240 d) none	1
2	In how many ways a football team of 11 players be selected from 20 players? a) $20 P_{11}$ b) $20C_{11}$ c) $20 P_4$ d) $11C_{20}$	1
3	Find the 10 th term in the expansion of $(2x^2 - \frac{1}{x})^{12}$ a) $\frac{-220}{x^3}$ b) $\frac{264}{x^6}$ c) $\frac{24}{x^9}$ d) 495	1
4	What is the number of terms in the expansion of $(1 + x^2)^{20}$ a) 20 b) 21 c) 40 d) 41	1
SECTION B		
5	Find 'a' if the 17 th and 18 th terms of the expansion $(2 + a)^{50}$ are equal. Ans: a = 1	2
6	Prove that there is no term involving x^6 in the expansion of $(2x^2 - \frac{3}{x})^{11}$ Ans: Term with $x^6 = (-1)^r {}^{11}C_r (2x^2)^{11-r} (3/x)^r$ $x^{22-3r} = x^6$ $r = 16/3 \text{ not possible.}$ Therefore no term with x^6	2

7	<p>How many different words can be formed from the letters of the word PERMUTATION?</p> <p>Ans: $\frac{11!}{2!}$</p>	2
8	<p>Find the constant term in the expansion of $(2x - \frac{1}{x})^{20}$</p> <p>Ans: $(-1)^r 20C_r (2x)^{20-r} (1/x)^r$ $x^{20-2r} = x^0$ $20 - 2r = 0$ $r = 10$ $20C_{10} \cdot 2^{10}$</p>	2
SECTION C		
9.	<p>A School administration decides to send some of its students of class 11 to an educational tour from a class of 25 students. 10 are to be chosen for the tour. There are 3 friends Rajesh , Shreya and Deepa – who decide that either all of them will join or none of them will join.</p>  <p>Based on the above information answer the following :</p> <p>(i) In how many ways can the students be chosen for this educational tour, if these three friends will join?</p> <p>(a) $22 C_{10}$ (b) $25 C_7$ (c) $25 C_{10}$ (d) $22 C_7$</p> <p>(ii) In how many ways can the students be chosen for this educational tour, if these three friends will not join?</p> <p>(a) $22 C_{10}$ (b) $25 C_7$ (c) $25 C_{10}$ (d) $22 C_7$</p> <p>(iii) In how many ways can the students be chosen for this educational tour?</p> <p>a) $22 C_7 + 25 C_{10}$ b) $22 C_7 + 22 C_{10}$</p>	4

	<p>(C) $25 C_7 + 22 C_{10}$ d) $23 C_7 + 23 C_{10}$</p> <p>(iv) Mr O.P. GUPTA, the Mathematics teacher of school puts some questions for these three students - with a condition that if any one of them answers correctly then, they may join this tour. He asks them to find the number of words formed using all the letters of 'Rajesh'. Deepa answers it correctly. What could be her answer?</p> <p>(a) 720 (b) 7200 (c) 120 (d) 240</p>	
10.	If the coefficients of the $(r - 1)^{th}$, r^{th} , $(r + 1)^{th}$ terms in the expansion of $(1 + x)^n$ are in the ratio 1:7:42. Find n and r	4