AnandNiketan
Maninagar Campus

Grade: XI	Subject: Maths	Marks : 80
Practice Paper {Syllabus: Ch.1,2,3,4,6,7,8,9}		Time :3 Hrs

General Instructions:

i) Section-A contains Questions 1 (i-x) and 2 (xi-xx) are of 1 mark each.

ii) Section-B contains Questions 3-7 are of 2 marks each.

iii) Section-C contains Questions 8-12 are of 4 marks each.

iv) Section-A contains Questions 13-17 are of 6 marks each.

v) All the questions are compulsory.

vi) Use of calculator is not allowed.

vii) An additional 10 minutes time will be given to just read the question paper.

SECTION – A

1. Choose the correct answer in Q. i – x:

i. The 10th common term between the series 3 + 7 + 11 + ... and 1 + 6 + 11 + ... is

(A) 191 (B) 193 (C) 211 (D) None of these

ii. The coefficient of *xn* in the expansion of $(1 + x)^{2n}$ and $(1 + x)^{2n-1}$ are in the ratio.

(A) 1 : 2 (B) 1 : 3 (C) 3 : 1 (D) 2 : 1

iii. In how many ways a committee consisting of 3 men and 2 women, can be chosen from 7 men and 5 women?

(A) 45 (B) 350 (C) 4200 (D) 230

iv. The length of a rectangle is three times the breadth. If the minimum perimeter of the rectangle is 160 cm, then

(A) breadth > 20 cm (B) length < 20 cm

(C) breadth *x* ε 20 cm (D) length δ 20 cm

v. Let P(n) : "$2^n < (1 \times 2 \times 3 \times ... \times n)$". Then the smallest positive integer for which P (n) is true is

(A) 1 (B) 2 (C) 3 (D) 4

vi. If $\sin\theta + \text{cosec}\,\theta = 2$, then $\sin^2\theta + \text{cosec}^2\theta$ is equal to

(A) 1 (B) 4 (C) 2 (D) None of these

vii. In an examination there are three multiple choice questions and each question has 4 choices. Number of ways in which a student can fail to get all answer correct is

(A) 11 (B) 12 (C) 27 (D) 63

viii. The value of tan 3A – tan 2A – tan A is equal to

(A) tan 3A tan 2A tan A

(B) – tan 3A tan 2A tan A

(C) tan A tan 2A – tan 2A tan 3A – tan 3A tan A

(D) None of these

ix. The value of sin 50° – sin 70° + sin 10° is equal to

(A) 1 (B) 0 (C) ½ (D) 2

x. The third term of G.P. is 4. The product of its first 5 terms is

(A) 4^3 (B) 4^4 (C) 4^5 (D) None of these

2. State True or False for the statements in Q. xi - xx:

xi. Two sequences cannot be in both A.P. and G.P. together.

xii. Three letters can be posted in five letterboxes in 3^5 ways.

xiii. The equality sin A + sin 2A + sin 3A = 3 holds for some real value of A.

xiv. If P = {1, 2}, then P × P × P = {(1, 1, 1), (2, 2, 2), (1, 2, 2), (2, 1, 1)}.

xv. There will be only 24 selections containing at least one red ball out of a bag containing 4 red and 5 black balls. It is being given that the balls of the same colour are identical.

xvi. Given A = {0, 1, 2}, B = {$x \in \mathbf{R} \mid 0 \leq x \leq 2$}. Then A = B.

xvii. The sets {1, 2, 3, 4} and {3, 4, 5, 6} are equal.

xviii. Given that M = {1, 2, 3, 4, 5, 6, 7, 8, 9} and if B = {1, 2, 3, 4, 5, 6, 7, 8, 9}, then B ⊄ M.

xix. The last two digits of the numbers 3^{400} are 01.

xx. Every progression is a sequence but the converse, i.e., every sequence is also a progression need not necessarily be true.

SECTION – B

3. Given 5 flags of different colours, how many different signals can be generated if each signal requires the use of 2 flags, one below the other?

4. Compute $(102)^5$.

5. The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes?

6. Match each of the set on the left described in the roster form with the same set on the right described in the set-builder form :

(i) {P, R, I, N, C, A, L}	(a) { *x* : *x* is a positive integer and is a divisor of 18}
(ii) { 0 }	(b) { *x* : *x* is an integer and *x*2 – 9 = 0}
(iii) {1, 2, 3, 6, 9, 18}	(c) {*x* : *x* is an integer and *x* + 1= 1}
(iv) {3, –3}	(d) {*x* : *x* is a letter of the word PRINCIPAL}

7. Let R be the relation on **Z** defined by R = {(a,b): a, $b \in$ **Z**, $a - b$ is an integer}. Find the domain and range of R.

SECTION– C

8. Let f = {(1,1), (2,3), (0,–1), (–1, –3)} be a function from **Z** to **Z** defined by $f(x) = ax + b$, for some integers a, b. Determine a, b.

9. Show that: $\sin (n + 1)x \sin (n + 2)x + \cos (n + 1)x \cos (n + 2)x = \cos x$.

10. Show that $9^{n+1} - 8n - 9$ is divisible by 64, whenever n is a positive integer.

11. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C1, 50 to chemical C2, and 30 to both the chemicals C1 and C2. Find the number of individuals exposed to

    (i) Chemical C1 but not chemical C2 (ii) Chemical C2 but not chemical C1

    (iii) Chemical C1 or chemical C2

12. How many words, with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DAUGHTER?

SECTION – D

13. Find a if the coefficients of x^2 and x^3 in the expansion of $(3 + ax)^9$ are equal.

14. Solve the following system of inequalities graphically:

    $3x + 2y \leq 150$, $x + 4y \leq 80$, $x \leq 15$, $y \geq 0$.

15. 150 workers were engaged to finish a job in a certain number of days. 4 workers dropped out on second day, 4 more workers dropped out on third day and so on. It took 8 more days to finish the work. Find the number of days in which the work was completed.

16. Find the expansion of $(2x -3y+4z)^3$ using binomial theorem.

17. Using P.M.I prove that: $x^{2n} - y^{2n}$ is divisible by $x + y$.

"ALL THE VERY BEST"

●●●