

LITTLE FLOWERS PUBLIC SR. SEC. SCHOOL
SUMMATIVE ASSESSMENT - I (MOCK TEST – I)

TIME : 3HRS.

CLASS – XI SUBJECT : MATHEMATICS

Max. Marks : 80

GENERAL INSTRUCTIONS :-

1. All questions are compulsory.
2. SECTION – A comprises of 6 questions of one marks each.
3. SECTION – B comprises of 11 questions of four marks each.
4. SECTION – C comprises of 5 questions of six marks each.

SECTION – A

- Q. 1. Write the set $\{0, 3, 4\}$ in set builder form.
- Q. 2. Consider $f, g : \mathbb{N} \rightarrow \mathbb{N}$ defined as $f(x) = 3x - 2, g(x) = 4x - 3$, find $f \circ g(2), g \circ f(2)$
- Q. 3. If $\cot x = -\frac{5}{12}$, x lies in 2^{nd} quadrant find the value of $2 \sin(2x) + 1$
- Q. 4. Find x and y if $(3 + i)x + (1 - 2i)y + 7i = 0$
- Q. 5. Solve for natural 'x' : $1 \leq |x - 2| \leq 3$.
- Q. 6. Find 'n' if $P(n, 5) = 20 P(n, 3)$

SECTION – B

- Q. 7. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C_1 , 50 to chemical C_2 , and 30 to both the chemicals C_1 and C_2 . Find the number of individuals exposed to
(i) Chemical C_1 but not chemical C_2 (ii) Neither Chemical C_1 nor chemical C_2 .
- Q. 8. For any three sets A, B and C,
prove that: $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(C \cap A) + n(A \cap B \cap C)$
- Q. 9. Find the domain and range of the function $f(x) = \frac{1}{\sqrt{16 - x^2}}$
- Q. 10. Prove that : $\frac{1 - \sin x}{1 + \sin x} = \tan^2 \left\{ \frac{\pi}{4} - \frac{x}{2} \right\}$
- Q. 11. Solve for 'x' : $\sqrt{3} \sin x - \cos x = \sqrt{2}$.
- Q. 12. By using principle of mathematical induction, prove that for all $n \geq 1, (n + 3)^2 < 2^{n+3}$
- Q. 13. Find the polar form of the complex number $\frac{1 + 7i}{(2 - i)^2}$
- Q. 14. If $z = x + iy, z^{1/3} = a - ib$ and $bx + ay = kab (a^2 + b^2)$, then find the value of 'k'.
- Q. 15. A plumber can be paid under two schemes given as; **Scheme – I : Rs 600** and **Rs 50** per hour,
Scheme – II : Rs 170 per hour.
If the job takes n hours, for what values of n does the **Scheme – II** gives the plumber better wages?

Q. 16. Find the number of different five letter words of 3 consonants and 2 vowels that can be made from the letters of the word **INVOLUTE**.

Q. 17. What is the position of the word '**INDIAN**' if letters of the given word are arranged as in dictionary ?

SECTION – C

Q. 18. Prove that : $\cos\left(\frac{\pi}{5}\right) \cos\left(\frac{2\pi}{5}\right) \cos\left(\frac{4\pi}{5}\right) \cos\left(\frac{8\pi}{5}\right) = \frac{-1}{16}$

Q. 19. Using Principle of Mathematical Induction prove that for all $n \geq 1$, $2 \cdot 4^{2n+1} + 3^{3n+1}$ is divisible by 11.

Q. 20. Solve for 'x' : $x^2 - 5x - ix - i + 18 = 0$.

Q. 21. Solve the system of inequalities graphically :

$$x + y \leq 4, x + 5y \geq 4, 6x + 2y \geq 8, x \leq 3, y \leq 3, x \geq 0, y \geq 0$$

Q. 22. From a pack of 52 cards 5 cards are being selected at random. In how many ways of these cards

(i) all kings are selected? (ii) at most one face card is selected? (iii) at least 3 club are selected?
