LITTLE FLOWERS PUBLIC SR. SEC. SCHOOL

SUMMATIVE ASSESSMENT - II (MOCK TEST – III)

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. *If f (x) = 2x + 3 ; g(x) = 3x – 4 , then find (i) fog (–1) (ii) gof (–1)*

Q. 2. 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.

Q. 3. Find the angle in degree through which a pendulum swings if its length is 75 *cm* and the tip describes an arc of length 21 *cm*.

Q. 4. The perpendicular from origin to a line meets at the point (–2, 9), find the equation of the straight line.

Q. 5. Find the image of the point (1, 2, 3) in *XY – plane*.

Q. 6. Find $lim_{x \to 0}\{cosec\ x - \cot x\}$

SECTION – B

Q. 7. A survey shows that 63% of Indians like coffee, whereas 76% likes tea. If x % of Indians like both coffee and tea, find the range of possible values of x.

Q. 8. If in a triangle ABC, $\frac{1}{a+c} + \frac{1}{b+c} = \frac{3}{a+b+c}$ then prove that $\angle C = 60^\circ$

OR

In a triangle *ABC* if $a \cos A = b \cos B$ then prove that the triangle is either isosceles or right angled.

Q. 9. Show that : $\frac{sec\ 8x - 1}{sec\ 4x - 1} = \frac{tan\ 8x}{tan\ 2x}$

OR

Prove that ; $2cos\left(\frac{\pi}{13}\right) . cos\left(\frac{9\pi}{13}\right) + cos\left(\frac{3\pi}{13}\right) + \cos\left(\frac{5\pi}{13}\right) = 0$.

Q. 10. Using Principle of Mathematical Induction prove that for all $n \geq 1$, $1^2 + 2^2 + 3^2 + - - - + n^2 > \frac{n^3}{3}$

Q. 11. How many natural number not exceeding 4321 can be formed with the digits 1, 2, 3 and 4 if the digits can repeat**?**

Q. 12. Find the total number of words formed, with or without meaning, from the letters of the word *ELLIPSE* taken four at a time**.**

OR

What is the number of ways of choosing three cards from a pack of 52 playing cards**?** In how many of these exactly two cards are of the same suit**,**

Q. 13. Find the equation of hyperbola having foci (± 4, 0) and the length of latus rectum is 12**.**

Q. 14. Find the distance of the point (1, 2) from the line 4x + 7y + 5 = 0 measured along the line $2x - y = 3$.

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Q. 15. A point R with *x – coordinate* 4 lies on the line segment joining the points P(2, –3, 4) and Q (8, 0, 10). Find the coordinates of the point R.

Q. 16. If $y = \sqrt{\frac{x}{a}} + \sqrt{\frac{a}{x}}$, prove that, $2xy\frac{dy}{dx} = \frac{x}{a} - \frac{a}{x}$

OR

If $y = \sqrt{x} + \frac{1}{\sqrt{x}}$, prove that, $2x\frac{dy}{dx} + y = 2\sqrt{x}$

Q. 17. In a relay race there are five teams A, B, C, D and E. Find the probability that
(*i*) A, B and C finish first, second and third, respectively (*ii*) A, B and C are first three to finish.

SECTION – C

Q. 18. If A, B and C can solve a problem with respective probabilities $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{6}$. Find the probabilities of
(*i*) Problem is solved (*ii*) Exactly one of them solves (*iii*) Exactly three of them solves

Q. 19. Using first principle, find the differential coefficient of the function $f(x) = x^2 \sin x$

OR

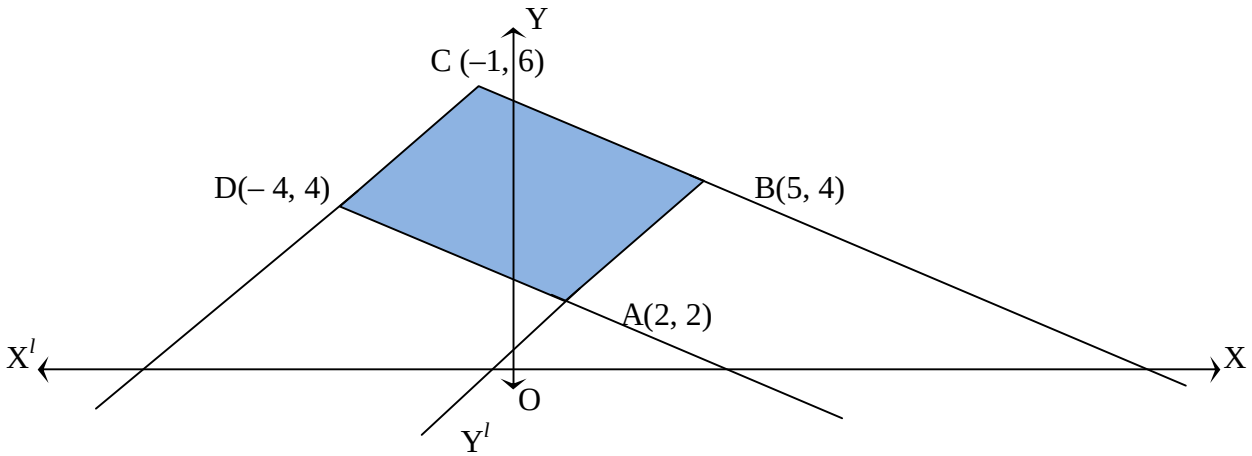
Find the value of '*a*' and '*b*', so that $\lim_{x \to 1} f(x) = f(1)$, for the function

$$f(x) = \begin{cases} 5ax - 2b & ; x < 1 \\ 11 & ; x = 1 \\ 3ax + b & ; x > 1 \end{cases}$$

Q. 20. Two vertices of a triangle are (3 , –1) and (–2 , 3) and its orthocenter is at origin. Find the coordinates of the third vertex.

Q. 21. Find the equation of the circle which passes through the point (4, 1) and (6, 5) and whose centre lies on the line $4x + y = 16$.

Q. 22. Obtain the inequalities, which give the following shaded region.



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