

Subject: MATHEMATICS Topic: MATHS I &amp; II Name of the Teacher: ANILKUMAR Date: 09/04/2020

FYJC ARTS/COMMERCE

1. If  $A = \{x/6x^2 + x - 15 = 0\}$   $B = \{x/2x^2 - 5x - 3 = 0\}$   $C = \{x/2x^2 - x - 3 = 0\}$  then find i)  $(A \cup B \cup C)$  ii)  $(A \cap B \cap C)$
2. There are 260 persons with a skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B, and 36 to both chemicals A and B, find the number of persons exposed to i) Chemical A but not Chemical B ii) Chemical B but not Chemical A iii) Chemical A or Chemical B
3. If  $f(x) = x^2 + 2$  and  $g(x) = 5x - 8$ , then find i)  $(f + g)(1)$  ii)  $(f - g)(-2)$  iii)  $(f \cdot g)(3)$  iv)  $f/g(0)$
4. Find the value of  $x^3 - x^2 + x + 46$ , if  $x = 2 + 3i$ .
5. Find the square root of the following complex numbers,  $7 + 24i$
6. Find the sum to n terms  $3 + 33 + 333 + 3333 + \dots$
7. If A (4, 1) and B (5, 4), find the equation of the locus of point P if  $PA^2 = 3PB^2$ .
8. Solve the following equations using Cramer's Rule  $x + y - z = 2$ ,  $x - 2y + z = 3$ ,  $2x - y - 3z = -1$
9. Show that the following equations are not consistent  $x + 2y = 1$ ,  $x - y = 2$  and  $x - 2y = 0$
10.  $\lim_{x \rightarrow 3} \left[ \frac{x^2 + 2x - 15}{x^2 - 5x + 6} \right]$
11.  $\lim_{x \rightarrow 0} \left[ \frac{8^x - 4^x - 2^x + 1}{x^2} \right]$
12. For what values of a and b is the function continuous on its domain.
 
$$f(x) = ax + 2b + 18 \quad \text{for } x \leq 0$$

$$= x^2 - 3a + b \quad 0 < x \leq 2$$

$$= 8x - 2. \quad x > 2$$
13. Differentiate w.r.t x
  - i.  $y = \frac{5}{x^2} + 5x^{\frac{7}{2}}$
  - ii.  $y = x^3 \log x$
  - iii.  $y = \frac{xe^x}{x + e^x}$

14. Calculate  $D_9$  and  $D_{20}$  of the following distribution.

LENGTH	0-20	20 - 40	40- 60	60- 80	80- 100	100 -120
NO. OF UNITS	1	14	35	85	90	15

15. A die is rolled 30 times and the following distribution is obtained. Find the variance and S.D

SCORE	1	2	3	4	5	6
FREQUENCY	2	6	2	5	10	5

16. A distribution, mean =100 mode = 127 and SD = 60. Find the Pearson coefficient of skewness.

17. Following data gives age (X in years) of students in a particular school and their marks in G.K. test. Prepare a bivariate frequency distribution

X : 11 11 10 13 12 10 12 12 13 10 11 13 12 12 12 11 13 10 10 11

Y : 22 24 23 21 24 21 22 23 24 24 22 23 21 24 21 22 24 22 23 24

Also obtain i) Marginal frequency distributions of age and marks in G.K. ii) Conditional frequency distribution of age when marks in G.K. are 23 iii) Conditional frequency distribution of marks in G.K. when the age is 11 years.

18. . Find correlation coefficient.

X	6	2	10	4	8
Y	9	11	5	8	7

19. Determine the number of arrangements of letters of the word ALGORITHM if. (i) vowels are always together. (ii) no two vowels are together. (iii)consonants are at even positions. (iv) O is first and T is last.

20. Two cards are drawn from a pack of 52 cards. Find the probability that a) Both are black. b) Both are diamond. c) Both are ace cards. d) Both are face cards. e) One is spade and other is non-spade. f) Both are from same suit. g) Both are from same denomination.

21. Solve the following in equations graphically in two-dimensional plane.  $2x - y \leq -2$

22. Sanjeev started a business investing Rs.25,000 in 1999. In 2000, he invested an additional amount of Rs. 10,000 and Rajeev joined him with an amount of Rs. 35,000. In 2001, Sanjeev invested another additional amount of Rs.10,000 and Pawan joined them with an amount of Rs.35,000. What will be Rajeev’s share in the profit of Rs.1,50,000 earned at the end of 3 years from the start of the business in 1999?

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