Plus One, Group - 3

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Answer any 6 Questions from 1-8

1. $A = \{1, 3\}$ $B = \{x : 1 < x < 5, x \in N\}$
   (i) Write B in roster form [1]
   (ii) Find A - B [1]
   (iii) Write the subset of A [1]

2. $A = \{1, 2, 3, 4, 5\}$
   $R = \{(x, y) : y = x + 1, x, y \in A\}$
   (i) Write R in roster form [1]
   (ii) Write the Domain and Range of R [2]

3. Solve the inequality

$$\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$$ [3]

4 (i) Find the number arrangements of the letters of the word 'INDEPENDENCE' [2]
   (ii) How many of them start with 'P' [1]

5 Using first principle, find the derivative of $f(x) = \cos x$ [3]

6. (i) Find the radian measure corresponding to the degree measure 25° [1]
   (ii) If $\cos x = \frac{-3}{5}$ & x lies in the IIIrd quadrant, find the value of $\sin x$ and $\tan x$ [2]

7 (i) Write the octent in which the point (1, -2, 3) lies [1]
   (ii) Find the distance between the points (1, -3, 2) and (2, 0, -4) [2]

8. (i) Find the centre and radius of

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$(x+5)^2 + (y-3)^2 = 36$ [1]

(ii) Find the equation of the parabola with focus (6,0) and equation of the directrix $x = -6$ [2]

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Answer any 6 questions from 9-16

9) Let $A = \{2, 4, 5, 6\}$, $B = \{5, 6, 7, 8\}$
Prove that $(A \cup B)' = A' \cap B'$ [4]

10 Consider the function $f : R \to R$
$f(x) = |x| + 2$
(i) Draw the graph of f [2]
(ii) Write its Domain and Range [2]

11 A committee of 3 person is to be constituted from a group 2 men and 3 women
(i) In howmany ways can this be done [2]
(ii) Howmany of these would consists of 1 man and 2 women [2]

12 (i) Number of terms in an expansion of $(a-b)^9$ is _____ [1]
(ii) Expand $(x^2 + \frac{1}{x})^5$ [3]

13 Express the following in the form $(a+ib)$
(i) $\frac{(3+i\sqrt{5})(3-i\sqrt{5})}{(\sqrt{3}+\sqrt{2}i)-(\sqrt{3}-i\sqrt{2}}$ [3]

(ii) $i^{19} =$ _____ [1]

14 The sum of first three terms of a GP $\frac{13}{12}$ and their Product is -1 Find the common ratio and the terms [4]

15 Find the co-ordinate of foci, vertices, eccentricity and the length of the latus rectum of the ellipse $\frac{x^2}{49} + \frac{y^2}{36} = 1$ [

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16 If E and F are two events, then $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$

Find (i) $P(E \text{ or } F)$ [1]

(ii) $P(\text{not } E)$ [1]

(iii) $P(\text{not } E \text{ and not } F)$ [2]

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Answer any 3 questions from 17-20

17 (i) 1 card is drawn from a well shuffled pack of 52 cards. Find the probability that

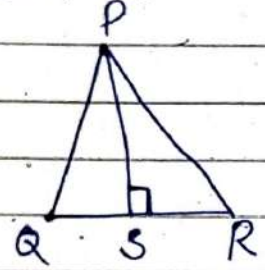
(a) The card drawn is a diamond [1]

(b) The card drawn is an ace [1]

(c) The card drawn is not a black card [1]

(ii) Show that $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x$ [3]

18. The vertices of the ΔPQR are $P(2,1)$ $Q(-2,3)$ $R(4,5)$



(i) Find the equation of QR [2]

(ii) Find the slope of PS [2]

(ii) Find the distance from P to QR [2]

19. (i) Find $\lim_{x \to 0} \frac{\sqrt{1+x} - 1}{x}$ [2]

(ii) $\lim_{x \to a} \frac{x^n - a^n}{x - a} =$ ____ [1]

(iii) Find the derivative of $y = \frac{x^5 - \cos x}{\sin x}$ [3]

20 Find the mean and variance, and Standard deviation of the following data. [6]

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

Group 3

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Members

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