



Purnata International School

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Examination P A 1 2021 – 2022

Student Name		Grade 11 th	
Date	16 – 07 -2021	Subject	MATHEMATICS
	Time	Total Marks	50

Solve question 1 to 8 each carry 2 marks each (Any Six)

[2 X 6 = 12]

- Write the following sets in the set-builder form: {2, 4, 8, 16, 32}
- If $G = \{7, 8\}$ and $H = \{5, 4, 2\}$, find $G \times H$ and $H \times G$.
- Let $A = \{1, 2\}$ and $B = \{3, 4\}$, write $A \times B$. How many subsets will $A \times B$ have?
- Find the radian measures corresponding to the following degree measures: 25°
- Write the following as intervals : $\{x : x \in R, -4 < x \leq 6\}$
- A function f is defined by $f(x) = 2x - 5$. find values of $f(7)$ and $f(-3)$
- Find the angle in radians through which a pendulum swings if its length is 75 cm and the tip describes an arc of length: 10 cm
- Which of the following sets are finite or infinite:
 - The set of months of a year.
 - $\{1, 2, 3, \dots\}$

Solve question from 9 to 15 each carry 3 marks (Any Six)

[3 X 6 = 18]

- Are the following pairs of sets equal? Give reason.
 $A = \{2, 3\}$ and $B = \{x : x \text{ is a solution of } x^2 + 5x + 6\}$
- The Cartesian Product $A \times A$ has 9 elements among which are found $(-1, 0)$ and $(0, 1)$. Find the set A and the remaining elements of $A \times A$.
- Find the value of: $\sin 75^\circ$
- Prove that: $\cot^2 \frac{\pi}{6} + \operatorname{cosec} \frac{5\pi}{6} + 3 \tan^2 \frac{\pi}{6} = 6$
- Let $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{2, 4, 6, 8\}$. Find $A - B$ and $B - A$
- Let $A = \{1, 2, 3\}$, $B = \{3, 4\}$ and $C = \{4, 5, 6\}$. Find : $A \times (B \cup C)$
- If X and Y are two sets such that $X \cup Y$ has 50 elements, X has 28 elements, and Y has 32 elements, how many elements does $X \cap Y$ have?

Solve question 16 to 19 each carry 5 marks

[5 X 4 = 20]

16. Find the union of each of the following pairs of sets:

(i) $X = \{1, 3, 5\}$ and $Y = \{1, 2, 3\}$

(ii) $A = \{a, e, i, o, u\}$ and $B = \{a, b, c\}$

(iii) $A = \{x: x \text{ is a natural number and multiple of } 3\}$ and $B = \{x: x \text{ is a natural number less than } 6\}$

(iv) $A = \{x: x \text{ is a natural number and } 1 < x \leq 6\}$ and $B = \{x: x \text{ is a natural number and } 6 < x < 10\}$

(v) $A = \{1, 2, 3\}$ and $B = \emptyset$

17. Prove that:

$$\frac{\cos(\pi + x) \cos(-x)}{\sin(\pi - x) \cos\left(\frac{\pi}{2} + x\right)} = \cot^2 x$$

18. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.

19. (i) State that the given relation is a function? Give reason. If it is a function, determine its domain and range. $\{(2, 1), (5, 1), (8, 1), (11, 1), (14, 1), (17, 1)\}$

(ii) State that the given relation is a function? Give reason. If it is a function, determine its domain and range. $R = \{(2, 1), (4, 2), (6, 3), (8, 4), (10, 5), (12, 6), (14, 7)\}$

(iii) State that the given relation is a function? Give reason. If it is a function, determine its domain
And range : $R = \{(1, 3), (1, 5), (2, 5)\}$