RAMAGYA SCHOOL, NOIDA

XI/MATHS/2018-19

OLYMPIAD PRACTICE WORKSHEET

(Concept based)

1. If (A+B) means A is the sister of B, (AxB) means A is the wife of B, (A ÷B) means A is the father of B and (A-B) means A is the brother of B. Which of the following means T is the daughter of P?

(a) PxQ÷R+S-T (b) PxQ÷R-T+S (c) PxQ÷R+T-S (d) PxQ÷R+S+T

2. The number of subsets of a set containing n elements is

(a) n (b) n^2 (c) 2^{n-1} (d) 2^n

3. One evening before sunset Rekha and Hema were talking to each other face to face. If Hema's shadow was exactly to the right of Hema, which direction was Rekha facing?

(a) North (b) South (c) West (d) Data Inadequate

4. If $A = \{1,3,5,B\}$ and $= \{2,4\}$, then

(a) $4 \epsilon A$ (b) $\{4\} \epsilon$ A (c) $B \epsilon$ A (d) None of these

5. Two finite sets have m and n elements respectively. The total number of subsets of first set is 112 more than the total number of subsets of second set. The value of m and n respectively are

(a) 5,2 (b) 4,7 (c) 7,4 (d) 2,5

6. If two sets A and B are having 43 elements in common, then the number of elements common to each of the sets $A \times B \; and \; B \times A$ is

(a) 43^2 (b) 2^{43} (c) 43^{43} (d) 2^{86}

(Application based)

7. A and B are two sets, $n(A-B) = 8 + 2x, \; n(B-A) = 6x \; and \; n(A \cap B) = x, if \; n(A) = n(B), then \; n(A \cap B) \; is$

(a) 26 (b) 50 (c) 24 (d) None of these

8. If $U = \{1,2,3\}$ and $A = \{1,2\}$ then $[P(A)\,]'$ is equal to

(a) $\{\{3\},\{2,3\},\{1,3\},\{1,2\},\emptyset\}$ (b) $\{\{3\},\{2,3\},\{1,3\},\{1,2,3\}\}$

(c) $\{\{3\},\{2,3\},\{1,3\},\{1,2,3\},\emptyset\}$ (d) $\{\{3\},\{2,3\},\{1,3\},\{1,2\}\}$

9. If $A = \{1,3,5,7,9,11,13,15,17\} \; and \; B = \{2,4,6 \ldots\ldots 18\}$ and N is the universal set then $A' \cup \left(A \cup (B \cap B')\right)$ is

(a) A (b) B (c) $A \cup B$ (d) N

10. If $A = \{(x, y): y = e^x, x\epsilon\ R\}, B = \{(x, y): y = e^{-x}, x\epsilon\ R\}$, $then$

(a) $A \cap B = \emptyset$ (b) $A \cap B \neq \emptyset$ (c) $A \cup B = R$ (d) $A \cup B = A$

11. For any two sets A and B, $A \cap (A \cup B)$ is

(a) A (b) B (c) $\emptyset$ (d) None of these

12. Let $= \{1,2,3\}$, then total number of elements in $A \times A$ is

(a) 3 (b) 6 (c) 9 (d) 12

(HOTS)

13. The range of $f(x) = \left(\frac{x^2+x+2}{x^2+x+1}\right)$ is

(a) $(1,\frac{7}{4}]$ (b) $(1,\frac{7}{3}]$ (c) $(1,\frac{7}{2}]$ (d) (1,7]

14. If $f: R \to R: f(x) = 2x$ is

(a) one-one and onto (b) one-one and into

(c) many-one and onto (d) many-one and into

15. If $f(x) = 1 - \frac{1}{x}$, then $f\left(f\left(\frac{1}{x}\right)\right)$ is

(a)$\frac{1}{x}$ (b) $\frac{1}{1+x}$ (c) $\frac{x}{x-1}$ (d) $\frac{1}{x-1}$

16. If f(0)=0, f(1)=1, f(2)=2 and f(x)= f(x-2)+f(x-3), for x=3,4,5....., then f(9) is

(a) 12 (b) 13 (c) 14 (d) 10

17. If $f(x) = x^2 - 3x + 2$, then (fof)(x) is

(a) x^4 (b)$x^4 - 3x$ (c)$x^4 - 6x^3 + 10x^2 - 3x$ (d) None of these

18. The domain of the function $f = \{(1,3), (3,5), (2,6)\}$ is

(a) 1,3 and 2 (b) $\{1,3,2\}$ (c) $\{3,5,6\}$ (d) 3,5 and 6

(Value based)

19. In alphabet series, some alphabets are missing which are given in that order as one of the alternatives below it. Choose the correct alternative.: _ _ aba _ _ ba _ ab

(a) abbba (b) bbaba (c**)** baabb (d) abbab

20. Among A,B,C,D and E, E is taller than D but not as fat as D.C is taller than A but shorter than B.A is fatter than D but not as fat as B.E is thinner than C who is thinner than D.E is shorter than A. If all the persons stood in a line according to their height, who would be in the middle?

(a) A (b)B (c)C (d)D (e) E