



INDIAN SCHOOL AL WADI AL KABIR

Class:
Date : 23-05-2019

Holiday Assignment (2019-20)
Sub: MATHEMATICS

Submission Date
8th Aug 2019

Instructions:

- (i) *All questions are compulsory*
(ii) *Please write down the serial number of the question before attempting it.*

Section A : Multiple Choice Question

Q.1. In a town of 840 persons, 450 persons read Hindi, 300 read English and 200 read both. Then the number of persons who read neither is:

- A** 210 **B** 290 **C** 180 **D** 260

Q.2. The domain and range of the function $f(x) = 2 - |x - 5|$

- A** $\mathbb{R}, (-\infty, 2]$ **B** \mathbb{R}, \mathbb{R} **C** $\mathbb{R}^+, \mathbb{R}^+$ **D** $\mathbb{R}, [2, \infty)$

Q.3. Principal solution of $2\sin x + 1 = 0$

- A** $\frac{\pi}{6}, \frac{5\pi}{6}$ **B** $\frac{5\pi}{6}, \frac{7\pi}{6}$ **C** $\frac{7\pi}{6}, \frac{11\pi}{6}$ **D** None of these

Section A : Match the following

	Column A	Column B
Q.4.	$n(A)=3, n(B) = 2$, then number of relation from A to B	(i) 63
Q.5.	$f(x) = 3x^2 + 2x + 7$, $g(x) = \sec^2 x$, the $f(g(\frac{\pi}{3}))$	(ii) 10
Q.6.	If $\sec \theta = \sqrt{2}$ and $\frac{3\pi}{2} < \theta < 2\pi$, value of $\frac{1 + \tan \theta + 5 \sec^3 \theta}{1 + \cot \theta - \operatorname{cosec} \theta}$	(iii) 64
		(iv) 6

Section B : Short Answer Questions (Type – 1)

- Q.7.** Prove that if $\tan A = x \tan B$, then $\frac{\sin(A-B)}{\sin(A+B)} = \frac{x-1}{x+1}$
- Q.8.** Solve: $\tan x + \tan 2x + \sqrt{3} \tan x \tan 2x = \sqrt{3}$
- Q.9.** Two finite sets have m and n elements. The total number of subsets of the first set is 112 more than the total number of subsets of the second set. Find the value of m and n .
- Q.10.** Given: For two finite sets A and B , $n(A-B) = 20+x$, $n(B-A) = 3x$ and $n(A \cap B) = x+1$. If $n(A) = n(B)$, find the value of x and $n(A \cup B)$
- Q.11.** $f(x) = \begin{cases} 2x + 3, & 0 \leq x < 3 \\ 3x + 1, & 3 \leq x < 5 \\ x^2 + 1, & 5 \leq x < 8 \end{cases}$, $x \in W$. Write the function in roster form.
- Q.12.** Write domain and range of the function $f(x) = \sqrt{9 - x^2}$

Section C : Long Answer Questions (Type – 1)

- Q.13.** $U = \{1, 2, 3, \dots, 10\}$, $A = \{2, 3, 4, 5\}$, $B = \{3, 5, 7, 9\}$, $C = \{1, 3, 5, 7, 9\}$.
Find (i) $A^1 \cap B^1$, (ii) $A - (B \cup C)$, (iii) $(A - B) \cup (B - C)$.
Verify: $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- Q.14.** If $3\sin x = 4\cos x$, x lies in the third quadrant, find the values of $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$
- Q.15.** Prove: $\frac{\cos 8A \cos 5A - \cos 12A \cos 9A}{\sin 8A \cos 5A + \cos 12A \sin 9A} = \tan 4A$
- Q.16.** Solve: $2\cos^2 x + 3\sin x = 0$
- Q.17.** If $f(x) = \frac{x-1}{x+1}$, then show that $f\left(\frac{1}{x}\right) = -f(x)$ and $f\left(-\frac{1}{x}\right) = -\frac{1}{f(x)}$
- Q.18.** Write the following in the roster form: (i) $A = \{x: x^3 = x, x \in R\}$ (ii) $B = \{x: x^4 - 5x^2 + 6 = 0\}$

Section D : Long Answer Questions (Type – 2)

Q.19. Out of 1020 boys in a school, 406 play cricket, 324 play hockey, 250 play football, 80 play cricket and hockey, 64 play hockey and football, 72 play football and cricket and 246 play none of the games. How many boys play (i) all the three games (ii) only two of the three games (iii) Football only.

Q.20 Prove: $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$

Q.21 Prove: $(1 + \cos \frac{\pi}{8})(1 + \cos \frac{3\pi}{8})(1 + \cos \frac{5\pi}{8})(1 + \cos \frac{7\pi}{8}) = \frac{1}{8}$

Q.22. In a town of 10000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three newspapers, find the number of families who buys i) A only, ii) C only iii) exactly two newspapers iv) none of A, B or C .

Ans. (i) 3300 (ii) 500 (iii) 600 (iv) 4000

Q.23. Prove: $\frac{\sin 3x + \sin 5x + \sin 7x + \sin 9x}{\cos 3x + \cos 5x + \cos 7x + \cos 9x} = \tan 6x$

Q.24. Solve: $\sin x - 3\sin 2x + \sin 3x = \cos x - 3\cos 2x + \cos 3x$

Q.25. In a university, out of 100 students, 15 passed in English; 12 passed in Mathematics; 8 in science; 6 in English and Mathematics; 7 in Mathematics and science; 4 English and Science and 4 in all the three. Using Venn diagram, find number of students who

(i) Passed in English and Mathematics but not in Science. (ii) passed in more than one subject.

Ans: 2, 9

1. B 2. A 3. C 4. (iii) 5.(i) 6. (ii)

8. $\frac{n\pi}{3} + \frac{\pi}{9}, n \in \mathbb{Z}$ 9. 7, 4 10. 10, 71 12. $[-3, 3], [0, 3]$ 14. $\frac{3}{\sqrt{10}}, -\frac{1}{\sqrt{10}}, -$

16. $x = n\pi + (-1)^n \frac{7\pi}{6}, n \in \mathbb{Z}$ 19. 10, 186, 124 24. $\frac{n\pi}{2} + \frac{\pi}{8}, n \in \mathbb{Z}$
