

Std : XI  
Date : 6/08/2022

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Margao - Goa  
FORMATIVE TEST - 1  
Subject : MATHEMATICS AND STATISTICS

Dur : 1 hr  
Marks : 20

- All questions are compulsory.
- The question paper consists of 14 questions divided into three sections A, B, C.
- Section A contains 10 questions of 1 marks each, which are multiple choice questions. section B contains 2 questions of 2 marks each, section C contains 2 questions of 3 marks each.
- There is no overall choice in the paper. However internal choice is provided in 1 question of 3 marks. In questions with choices only one of the choices to be attempted.
- Use of calculators is not permitted.

### SECTION - A

Question numbers 1 to 10 carry 1 mark each. In each question, four options are provided, out of which one is correct. Select and write the correct option.

- If  $A = \{12, 16, 18, 20\}$  and  $B = \{11, 15, 18, 20\}$ , then  $A - B =$  -----.  
 (A)  $\emptyset$   
 (B)  $\{12, 16\}$   
 (C)  $\{18, 20\}$   
 (D)  $\{11, 15\}$
- If  $f(x) = x - 7$  and  $g(x) = 2x$ , then  $f(g(x)) =$  -----.  
 (A)  $x - 7$   
 (B)  $2x - 7$   
 (C)  $2x - 14$   
 (D)  $2x - 21$
- $\sin(x - y) =$  -----.  
 (A)  $\sin x \cos y - \cos x \sin y$   
 (B)  $\cos x \cos y - \sin x \sin y$   
 (C)  $\sin x \cos y + \cos x \sin y$   
 (D)  $\cos x \cos y + \sin x \sin y$
- The set  $B = \{x : x \in N, x^2 < 16\}$ , is described in the roaster form as -----.  
 (A)  $B = \{1, 2\}$   
 (B)  $B = \{1, 2, 3\}$   
 (C)  $B = \{1, 2, 3, 4\}$   
 (D)  $B = \{1, 2, 3, 4, 5\}$

5. The degree measure corresponding to the radian measure  $\frac{4\pi}{3}$  radians = ----.
- (A)  $210^\circ$   
 (B)  $220^\circ$   
 (C)  $230^\circ$   
 (D)  $240^\circ$
6. If a function  $f$  is defined as,  $f(x) = x^2 + x - 1$ , then  $f(5) = \dots\dots$ .
- (A) 10  
 (B) 25  
 (C) 29  
 (D) 31.
7.  $\cos(\pi - x) = \dots\dots$ .
- (A)  $-\cos x$   
 (B)  $\cos x$   
 (C)  $-\sin x$   
 (D)  $\sin x$
8. If  $F = \{11, 18\}$  and  $G = \{a\}$ , then  $F \times G = \dots\dots$ .
- (A)  $\{(11, a)\}$   
 (B)  $\{(11, a), (18, a)\}$   
 (C)  $\{(a, 11), (a, 18)\}$   
 (D)  $\{(11, a), (18, a), (a, 11)\}$
9. The radian measure corresponding to  $300^\circ = \dots\dots$ .
- (A)  $\frac{5\pi}{3}$  radians  
 (B)  $\frac{7\pi}{6}$  radians  
 (C)  $\frac{4\pi}{3}$  radians  
 (D)  $\frac{5\pi}{6}$  radians
10. If a fan makes 120 revolutions in one minute, then the angle it turns in one second = ---- radians
- (A)  $2\pi$   
 (B)  $3\pi$   
 (C)  $4\pi$   
 (D)  $5\pi$

#### SECTION - B

Question numbers 11 to 12, carry 2 marks each.

11. Determine the domain and range of the relation  
 $R = \{(a, b) : a \in N, a < 5 \text{ and } b = 7\}$ .

12. Prove that  $\frac{\sin(A+B) + \sin(A-B)}{\cos(A+B) + \cos(A-B)} = \tan A$ .

#### SECTION - C

Question numbers 13 to 14, carry 3 marks each.

13. If  $\sin x = \frac{4}{5}$ ,  $x$  lies in second quadrant. Find the value of  $\cos x$  and  $\sec x$ .
14. In a group of 950 persons, 750 like to watch movies and 460 like to listen to music. Find how many like to (a) watch movies and listen to music both.  
(b) watch movies only  
(c) listen to music only

OR

In a competition, a school awarded 100 medals in different categories. 35 medals in dance, 50 medals in dramatics and 29 medals in music were awarded to the students. 12 students were awarded medals for dance and dramatics, 8 were awarded medals for dance and music and 6 were awarded medals for dramatics and music. 5 medals were awarded in all the 3 categories. Find how many students were awarded medals in (a) only dance  
(b) exactly one category