

Topic : Function

Type of Questions

M.M., Min.

Comprehension (no negative marking) Q.1 to Q.3

(3 marks, 3 min.)

[9, 9]

Single choice Objective (no negative marking) Q.4,5,6

(3 marks, 3 min.)

[9, 9]

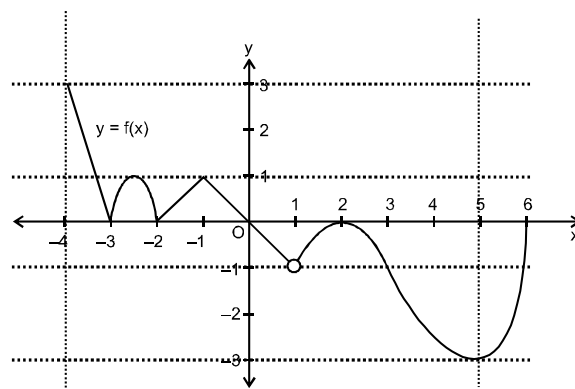
Subjective Questions (no negative marking) Q.7,8

(4 marks, 5 min.)

[8, 10]

COMPREHENSION (FOR Q.NO. 1 TO 3)

If graph of a given function $y = f(x)$ is as follows,



- The range of given function is
(A) $[-3, 3]$ (B) $[-4, 6]$ (C) $[-1, 1]$ (D) $[0, 3]$
- The length of longest interval for which the given function is one-one
(A) 1 unit (B) 2 unit (C) 3 unit (D) 4 unit
- Which of the following change in given curve does not represent a function
(A) $y = f(|x|)$ (B) $y = |f(x)|$ (C) $|y| = f(x)$ (D) $y = |f(|x|)|$
- Domain of the function $f(x) = \sqrt{\cos(\sin x)} + \sin^{-1}(x^2 - 1)$ is
(A) $[-1, 1]$ (B) $[-2, 2]$
(C) $[-\pi, -\sqrt{2}] \cup [\sqrt{2}, \pi]$ (D) $[-\sqrt{2}, \sqrt{2}]$
- Let $f(x) = [9^x - 3^x + 1]$ for all $x \in (-\infty, 1]$, then the range of $f(x)$ is ; ($[\cdot]$ denotes the greatest integer function)
(A) $\{0, 1, 2, 3, 4, 5, 6, 7\}$ (B) $\{0, 1, 2, 3, 4, 5, 6\}$
(C) $\{1, 2, 3, 4, 5, 6, 7\}$ (D) $\{1, 2, 3, 4, 5, 6\}$

6. The range of the function $f(x) = \sin^{-1} \left[x^2 + \frac{1}{2} \right] + \cos^{-1} \left[x^2 - \frac{1}{2} \right]$, where $[.]$ is greatest integer function.

- (A) $\left\{ \frac{\pi}{2}, \pi \right\}$ (B) $\left\{ 0, -\frac{1}{2} \right\}$ (C) $\{\pi\}$ (D) $\left(0, \frac{\pi}{2} \right)$

7. Find the range of the following functions .

(i) $f(x) = 4 \tan x \cdot \cos x$

(ii) $g(x) = 9 \cos 3x - 12 \cos^3 3x$

(iii) $h(x) = \cos (2 \sin x)$

(iv) $y = \sqrt{x - x^2}$

8. If f be a function defined on the set of non-negative integers and taking values in the same set. Given that, where $[.]$ denotes greatest integer function

(i) $x - f(x) = 17 \left[\frac{x}{17} \right] - 70 \left[\frac{f(x)}{70} \right]$ for all non-negative integers

(ii) $1700 < f(1770) < 1800$

Find the possible values $f(1770)$ can take.

Answers Key

1. (A) 2. (C) 3. (C) 4. (D)

5. (A) 6. (C)

7. (i) $(-4, 4)$ (ii) $[-3, 3]$ (iii) $[\cos 2, 1]$ (iv) $[0, 1/2]$

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