



XI-SCI : Maths
Functions,

DATE:

TIME: 1 Hours 30
Minutes

MARKS: 25

SEAT NO:

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Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1. Select and write the correct answer.

(4)

1. Find x , if $2\log_2 x = 4$
A) 4, -4 B) 4
C) -4 D) Not defined
2. The domain of definition of $f(x) = \sqrt{4x - x^2}$ is
A) $\mathbb{R} - [0, 4]$ B) $\mathbb{R} - (0, 4)$
C) $(0, 4)$ D) $[0, 4]$

Q.2. Answer the following.

(3)

1. Find $(f \circ g)(x)$ and $(g \circ f)(x)$ $f(x) = e^x$, $g(x) = \log x$
2. Which set of ordered pairs represent function from $A = \{1, 2, 3, 4\}$ to $B = \{-1, 0, 1, 2, 3\}$? Justify $\{(1, 2), (2, -1), (3, 1), (4, 3)\}$.
3. Find x , if $x = 3^3 \log_3 2$

Section B
Attempt any Four

- Q.3 Solve the following for x , where $|x|$ is modulus function, $[x]$ is greatest integer function, $\{x\}$ is a fractional part function. **(2)**
 $2\{x\} = x + |x|$
- Q.4 Let $f: \{2, 4, 5\} \rightarrow \{2, 3, 6\}$ and $g: \{2, 3, 6\} \rightarrow \{2, 4\}$ be given by $f = \{(2, 3), (4, 6), (5, 2)\}$ and $g = \{(2, 4), (3, 4), (6, 2)\}$, Write down $g \circ f$. **(2)**
- Q.5 Find the range of the following function. $f(x) = 1 + 2^x + 4^x$ **(2)**
- Q.6 Find whether following function is one-one. $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^2 + 5$ **(2)**
- Q.7 Let $f: \mathbb{R} - \{2\} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{x^2 - 4}{x - 2}$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $g(x) = x + 2$. **(2)**
Explain whether $f = g$ or not.
- Q.8 Find the domain and range of the following function. **(2)**
 $f(x) = \sqrt{x - 3} + \frac{1}{\log(5 - x)}$

Section C
Attempt any Two

Q.9 Solve for x. $\log_2 x + \log_4 x + \log_{16} x = \frac{21}{4}$ (3)

Q.10 Show that $7 \log \left(\frac{15}{16} \right) + 6 \log \left(\frac{8}{3} \right) + 5 \log \left(\frac{2}{5} \right) + \log \left(\frac{32}{25} \right) = \log 3$ (3)

Q.11 Solve the following for x, where $|x|$ is modulus function, $[x]$ is greatest integer function, $\{x\}$ is a fractional part function. (3)

$$|x^2 - 9| + |x^2 - 4| = 5$$

Section D
Attempt any One

Q.12 Solve: $\sqrt{\log_2 x^4} + 4 \log_4 \sqrt{\frac{2}{x}} = 2$ (4)

Q.13 If $\log \left(\frac{x - y}{4} \right) = \log \sqrt{x} + \log \sqrt{y}$, show that $(x + y)^2 = 20xy$ (4)