

## DPP

DAILY PRACTICE PROBLEMS

CLASS : XIIth  
DATE :

SUBJECT : MATHS  
DPP NO. : 2

### Topic :- RELATIONS AND FUNCTIONS

- Let  $X$  and  $Y$  be subsets of  $R$ , the set of all real numbers. The function  $f: X \rightarrow Y$  defined by  $f(x) = x^2$  for  $x \in X$  is one-one but not onto, if (Here,  $R^+$  is the set of all positive real numbers)
  - $X = Y = R^+$
  - $X = R, Y = R^+$
  - $X = R^+, Y = R$
  - $X = Y = R$
- If  $f(x) \cdot f(1/x) = f(x) + f(1/x)$  and  $f(4) = 65$ , then  $f(6)$  is
  - 65
  - 217
  - 215
  - 64
- The graph of the function of  $y = f(x)$  is symmetrical about the line  $x = 2$ , then
  - $f(x + 2) = f(x - 2)$
  - $f(2 + x) = f(2 - x)$
  - $f(x) = f(-x)$
  - $f(x) = -f(-x)$
- If  $f(x) = \begin{cases} -1; & x < 0 \\ 0; & x = 0 \\ 1; & x > 0 \end{cases}$  and  $g(x) = x(1 - x^2)$ , then
  - $f \circ g(x) = \begin{cases} -1; & -1 < x < 0 \text{ or } x > 1 \\ 0; & x = 0, 1, -1 \\ 1; & 0 < x < 1 \end{cases}$
  - $f \circ g(x) = \begin{cases} -1; & -1 < x < 0 \\ 0; & x = 0, 1, -1 \\ 1; & 0 < x < 1 \end{cases}$
  - $f \circ g(x) = \begin{cases} -1; & -1 < x < 0 \text{ or } x > 1 \\ 0; & x = 0, 1, -1 \\ 1; & 0 < x < 1 \text{ or } x < -1 \end{cases}$
  - $f \circ g(x) = \begin{cases} 1; & -1 < x < 0 \text{ or } x > 1 \\ 0; & x = 0, 1, -1 \\ 1; & 0 < x < 1 \text{ or } x < -1 \end{cases}$
- $x_2 = xy$  is a relation which is
  - Symmetric
  - Reflexive and transitive
  - Transitive
  - None of these
- The period of  $f(x) = \sin\left(\frac{\pi x}{n-1}\right) + \cos\left(\frac{\pi x}{n}\right), n \in Z, n > 2$ , is
  - $2n\pi(n-1)$
  - $4(n-1)\pi$
  - $2n(n-1)$
  - None of these
- $f: [-4, 0] \rightarrow R$  is given by  $f(x) = e^x + \sin x$ , its even extension to  $[-4, 4]$ , is
  - $-e^{|x|} - \sin |x|$
  - $e^{-|x|} - \sin |x|$
  - $e^{-|x|} + \sin |x|$
  - $-e^{-|x| + \sin |x|}$
- Let  $f: R \rightarrow R$  be a function defined by  $f(x) = -\frac{|x|^3 + |x|}{1 + x^2}$ , then the graph of  $f(x)$  lies in the
  - I and II quadrants
  - I and III quadrants
  - II and III quadrants
  - III and IV quadrants



9. The domain of the real valued function  $f(x) = \sqrt{1 - 2x} + 2 \sin^{-1} \left( \frac{3x-1}{2} \right)$  is  
 a)  $\left[-\frac{1}{3}, 1\right]$                       b)  $\left[\frac{1}{2}, 1\right]$                       c)  $\left[-\frac{1}{2}, \frac{1}{3}\right]$                       d)  $\left[-\frac{1}{3}, \frac{1}{2}\right]$
10. The domain of function  $f(x) = \log_{(x+3)}(x^2 - 1)$  is  
 a)  $(-3, -1) \cup (1, \infty)$   
 b)  $[-3, -1) \cup [1, \infty)$   
 c)  $(-3, -2) \cup (-2, -1) \cup (1, \infty)$   
 d)  $[-3, -2) \cup (-2, -1) \cup [1, \infty)$
11. The range of the function  $f(x) = x^2 - 6x + 7$  is  
 a)  $(-\infty, 0)$                       b)  $[-2, \infty)$                       c)  $(-\infty, \infty)$                       d)  $(-\infty, -2)$
12. The inverse of the function  $f: R \rightarrow (-1, 3)$  is given by  $f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}} + 2$   
 a)  $\log \left( \frac{x-1}{x+1} \right)^{-2}$                       b)  $\log \left( \frac{x-2}{x-1} \right)^{1/2}$                       c)  $\log \left( \frac{x}{2-x} \right)^{1/2}$                       d)  $\log \left( \frac{x-1}{3-x} \right)^{1/2}$
13. If  $f(x) = \frac{4^x}{4^{x+2}}$ , then  $f\left(\frac{1}{97}\right) + f\left(\frac{2}{97}\right) + \dots + f\left(\frac{96}{97}\right)$  is equal to  
 a) 1                      b) 48                      c) -48                      d) -1
14. The period of the function  $f(x) = \frac{\sin 8x \cos x - \sin 6x \cos 3x}{\cos 2x \cos x - \sin 3x \sin 4x}$  is  
 a)  $\pi$                       b)  $2\pi$                       c)  $\frac{\pi}{2}$                       d) None of these
15. Let  $f: R \rightarrow R: f(x) = x^2$  and  $g: R \rightarrow R: g(x) = x + 5$ , then  $g \circ f$  is  
 a)  $(x + 5)$                       b)  $(x + 5)^2$                       c)  $(x^2 + 5^2)$                       d)  $(x^2 + 5)$
16. The function  $f(x) = \log_{2x-5}(x^2 - 3x - 10)$  is defined for all  $x$  belonging to  
 a)  $[5, \infty)$                       b)  $(5, \infty)$                       c)  $(-\infty, +5)$                       d) None of these
17. Range of the function  $f(x) = \frac{x^2}{x^2+1}$  is  
 a)  $(-1, 0)$                       b)  $(-1, 1)$                       c)  $[0, 1)$                       d)  $(1, 1)$
18. Let  $f(x) = |x - 1|$ . Then,  
 a)  $f(x^2) = [f(x)]^2$   
 b)  $f(|x|) = |f(x)|$   
 c)  $f(x + y) = f(x) + f(y)$   
 d) None of these
19. If  $f(x) = a^x$ , which of the following equalities do not hold?  
 a)  $f(x + 2) - 2f(x + 1) + f(x) = (a - 1)^2 f(x)$   
 b)  $f(-x)f(x) - 1 = 0$   
 c)  $f(x + y) = f(x)f(y)$   
 d)  $f(x + 3) - 2f(x + 2) + f(x + 1) = (a - 2)^2 f(x + 1)$
20. Let  $A = \{x \in R: x \leq 1\}$  and  $f: A \rightarrow A$  be defined as  $f(x) = x(2 - x)$ . Then,  $f^{-1}(x)$  is

a)  $1 + \sqrt{1-x}$

b)  $1 - \sqrt{1-x}$

c)  $\sqrt{1-x}$

d)  $1 \pm \sqrt{1-x}$



SMARTLEARN  
COACHING