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Maths
KumarPage No.
Date:1. (B)

2. $(x, y) \in S \Leftrightarrow |x - y| \leq 1$

\rightarrow (A) સાચા સંબંધ છે.
(B) સ્વાચક, સંમિત છે, પરંપરિત નથી

3.

3. $A := \{2, 4, 6\}$

$B := \{2, 3, 5\}$

$\therefore A + B := 3 \times 3 = 9$

\therefore કુલ સંબંધો $= 2^9$ (A)

4. $f(1) = f(0) = 0$

 \therefore ચોક-ચોક નથી.5. (D) none

6. $f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}} + 2 = y$

4.

$$\frac{e^{2x} - 1}{e^{2x} + 1} = y - 2$$

$$\frac{e^{2x} + 1 - 2}{e^{2x} + 1} = y - 2$$

$$1 - \frac{2}{e^{2x} + 1} = y - 2$$

$$\frac{2}{e^{2x} + 1} = 3 - y$$

$$\frac{1}{e^{2x} + 1} = \frac{3 - y}{2}$$

$$e^{2x} + 1 = \frac{2}{3 - y}$$

$$e^{2x} = \frac{y - 1}{3 - y}$$

$$2x = \log \left(\frac{y - 1}{3 - y} \right)$$

$$x = \log \left(\frac{y - 1}{3 - y} \right)^{1/2} \quad (B)$$

7. संध्या :- $2^2 = 2^4 = 16$

8. $a * b = a + b + 10$

$$a + e + 10 = a$$

$$\boxed{e = -10} \quad (C)$$

9. (A) 8

10. $a * b = \frac{ab}{100}$

$$\frac{ae}{100} = a \Rightarrow \boxed{e = 100}$$

$$\therefore \frac{ab}{100} = 100$$

$$\therefore b = \frac{10000}{a}$$

$$\therefore b = \frac{10000}{0.1}$$

$$\therefore b = 100000 \quad (A)$$

$$11. \quad a * b = a^2 + b^2$$

$$\therefore a * (b * c) = a * (b^2 + c^2) \\ = a^2 + (b^2 + c^2)^2$$

$$\therefore (a * b) * c = (a^2 + b^2)^2 + c^2$$

(B) સમકર્મી દ્વિઘાતીય નિરાશરૂપ પાલન ન કરે.

$$12. \quad a * b = \frac{ab}{3}$$

$$\therefore 3 * \left(\frac{115 * 1/2}{3} \right)$$

$$\therefore \frac{3 + 1/30}{3}$$

$$\therefore \frac{1}{30} \quad (B)$$

$$13. \quad \cos^{-1}(2x-1)$$

$$\therefore -1 \leq 2x-1 \leq 1$$

$$\therefore 0 \leq 2x \leq 2$$

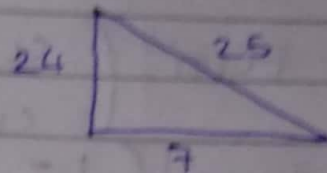
$$\therefore 0 \leq x \leq 1 \quad (A)$$

14. $\cos(\sin^{-1} 2/5 + \cos^{-1} x) = 0$ if $x = ?$

$\sin^{-1} 2/5 + \cos^{-1} x = \pi/2$
 $x = 2/5$ (B)

15. $\cot\left[\cos^{-1}\left(\frac{7}{25}\right)\right]$

$\rightarrow \cot(\cot^{-1}(7/24))$
 $= \frac{7}{24}$ (D)

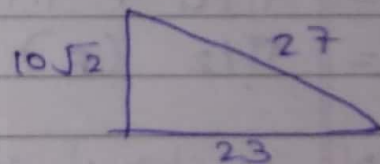


16. $\cos(2\cos^{-1} x + \sin^{-1} x)$

$\therefore \cos(2\cos^{-1} 1/3 + \sin^{-1} 1/3)$
 $= \cos(2\tan^{-1} 2\sqrt{2}/3 + \tan^{-1} 2\sqrt{2})$
 $= \cos(\tan^{-1} \frac{4\sqrt{2}}{-7} + \tan^{-1} 2\sqrt{2})$

$= \cos\left(\tan^{-1}\left(\frac{2\sqrt{2} - 4\sqrt{2}}{1 + \frac{16}{7}}\right)\right)$

$= \cos\left(\tan^{-1}\left(\frac{10\sqrt{2}}{23}\right)\right)$



$= \cos(\cos^{-1} 23/27)$

$= \frac{23}{27}$

17. $f(1) = \pi/2 + \pi/4 + 0 = 3\pi/4$

$f(-1) = -\pi/2 - \pi/4 + \pi = \pi/4$

(c) $\{\pi/4, 3\pi/4\}$

18. $\cos(2\cos^{-1}0.8)$

$= \cos(2\theta)$

$= 2\cos^2\theta - 1$

$= 2(0.64) - 1$

$= 0.28 \quad (D)$

19. $\tan^{-1}\left(\frac{a-b}{a+b}\right) + \tan^{-1}\left(\frac{b}{a}\right)$

$\rightarrow \tan^{-1}\left(\frac{1 - b/a}{1 + b/a}\right) + \tan^{-1}\left(\frac{b}{a}\right)$

$= \tan^{-1}(1)$

$= \frac{\pi}{4} \quad (C)$

20. $\cot^{-1}1 + \cot^{-1}2 + \cot^{-1}3 =$

$\rightarrow \tan^{-1}(1) + \tan^{-1}(1/2) + \tan^{-1}(1/3)$

$= \frac{\pi}{4} + \tan^{-1}\left(\frac{5}{5}\right)$

$= \pi/4 + \pi/4$

$= \pi/2 \quad (B)$

23. $\sin^{-1}x + \sin^{-1}y = \frac{2\pi}{3}$

$\therefore \frac{\pi}{2} - (\cos^{-1}x + \cos^{-1}y) = \frac{2\pi}{3}$

$\therefore \cos^{-1}x + \cos^{-1}y = \frac{\pi}{2} - \frac{2\pi}{3}$

$= -\pi/6$