

SECTION - 6

ANS - Q 2

Answer (i)

$$A = \{1, 2\} \quad B = \{3, 4\} \quad C = \{5, 6\}$$

L.H.S

$$\rightarrow (A \times C) \cup (B \times C)$$

$$\Rightarrow \{(1, 5), (1, 6), (2, 5), (2, 6)\} \cup \{(3, 5), (3, 6), (4, 5), (4, 6)\}$$

$$= \{(1, 5), (1, 6), (2, 5), (2, 6), (3, 5), (3, 6), (4, 5), (4, 6)\}$$

R.H.S

$$\Rightarrow (A \cup B) \times C$$

$$\Rightarrow \{1, 2, 3, 4\} \times \{5, 6\}$$

$$= \{(1, 5), (1, 6), (2, 5), (2, 6), (3, 5), (3, 6), (4, 5), (4, 6)\}$$

Hence, R.H.S = L.H.S

Proved

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Answer ii)

$$\therefore f(x) = \log(1+x) - \log(1-x)$$

$$\Rightarrow f(y) = \log(1+y) - \log(1-y)$$

$$\text{To prove - } f(x) + f(y) = \log(1+x+y+xy) - \log(1-x-y+xy)$$

L.H.S =

$$f(x) + f(y) = \log(1+x) - \log(1-x) + \log(1+y) - \log(1-y)$$

~~$$\rightarrow \log[(1+x)(1+y)]$$~~

~~$$\log\left(\frac{1+x}{1-x}\right)$$~~

$$\rightarrow \log(1+x) + \log(1+y) - [\log(1-x) + \log(1-y)]$$

$$= \log[(1+x)(1+y)] - \log[(1-x)(1-y)]$$

$$= \log\left[\frac{(1+x)(1+y)}{(1-x)(1-y)}\right]$$

$$= \log\left(\frac{1+y+x+xy}{1-y-x+xy}\right)$$

$$= \log(1+x+y+xy) - \log(1-x-y+xy)$$

= R.H.S

Hence proved