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Section: 01

Set B

Ans to the ques no: 1

$(ACBBE000)_{16}$

$= \underbrace{1}\underbrace{010\ 1100\ 1}\underbrace{011\ 1011\ 1110\ 0000\ 0000\ 0000}$

~~[illegible] × 2^{31}~~

$\therefore$ Sign = 1

$\therefore$ Biased exponent $= (01011001)_2$

$= 89$

$\therefore$ Actual exponent $= 89 - (2^{8-1} - 1)$

$= -38$

$\therefore$ Fraction $= (0.011\ 1011\ 111)_2$

$= 2^{-2} + 2^{-3} + 2^{-4} + 2^{-6} + 2^{-7} + 2^{-8} + 2^{-9} + 2^{-10}$

$= 0.4677734375$

$\therefore$ Decimal number $= (-1)^{sign} \times (1 + 0.4677734375) \times 2^{\text{Actual exponent}}$

$= (-1)^1 \times 1.4677734375 \times 2^{-38}$

$= -5.339728659 \times 10^{-12}$

(Ans)

Ans to the question no:-2

Values :- $\frac{13}{8} = (1.625)_{10}$

$= (1.101)_2$

$= 1.101 \times 2^0$

$\frac{9}{4} = 2.25$

$= (10.01)_2$

$= 1.001 \times 2^1$

By multiplying =>

$1.101 \times 2^0 \times 1.001 \times 2^1$

$= (1.101 \times 1.001) \times 2^{0+1}$

$= 1.110101 \times 2^1$

$= 1.11010 \times 2^1$

Converting the result into decimal,

$1.11010 \times 2^1 = (11.10101)_2$

$= 3.65625$

And the actual decimal multiplication

$$\frac{13}{8} \times \frac{3}{4} = 3.65625$$

So, it is an exact match, since no fractional value was lost during the calculation.