

Analytical Questions

1) Base 10 to base 16

$$\textcircled{i} (2020)_{10} \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 \mid 2020 \\ 16 \boxed{126} - 4 \\ 7 - 14 \end{array}$$

$$14 = E$$

$$= 7E4$$

$$= 7E4$$

$$(2020)_{10} = (7E4)_{16}$$

$$\textcircled{ii} (2020.65625)_{10} \rightarrow (\quad)_{16}$$

For Real part $(2020)_{10}$

$$= (7E4)_{16}$$

$$\text{So, } (2020)_{10} = (7E4)_{16}$$

For Fractional part $(0.65625)_{10}$

By using Multiplication Method

	Real Part	Fractional Part
0.65625×16	10	0.5
0.5×16	8	0.0

$$\text{From here } (0.65625)_{10} = (0.A8)_{16}$$

$$(2020.65625)_{10} = (7E4.A8)_{16}$$

$$\textcircled{iii} (172)_{10} \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 \mid 172 \\ 10 - 12 \\ \downarrow \quad \downarrow \\ A \quad C \end{array}$$

$$\text{From here } (172)_{10} = (AC)_{16}$$

$$\textcircled{iv} (172.983)_{10}$$

Real part is $(172)_{10}$

$$\rightarrow (172)_{10} = (AC)_{16}$$

then

$$(172.983)_{10} = (\underline{\underline{AC.FBA5}})_{16}$$

Fractional part $(0.983)_{10}$

	Real Part	Fractional Part
0.983×16	15 = F	0.728
0.728×16	11 = B	0.648
0.648×16	10 = A	0.368
0.368×16	5	0.188

$$(0.983)_{10} = (0.FBA5)_8$$

Hexadecimal.

\(2) \text{ Decimal number } 49 \text{ into }

$$(49)_{10} \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 \mid 49 \\ 3 - 1 \end{array}$$

$$= 31$$

$$(49)_{10} \rightarrow (31)_{16}$$

$$3) (122810)_10 \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 | 122810 \\ 16 | 7675 - 10 = A \end{array}$$

$$\begin{array}{r} 16 | 479 - 11 \rightarrow B \\ 16 | 29 - 15 \rightarrow F \end{array}$$

$$1 - 13 \rightarrow D$$

$1DFBA$

$$(122810)_10 \rightarrow (1DFBA)_{16}$$

$$4) (60010)_10 \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 | 60010 \\ 16 | 3750 - 10 = A \\ 16 | 234 - 6 \end{array}$$

$$14 - 10 = A$$

$$E \rightarrow (EAF) \rightarrow (EAF)_{16}$$

$$(60010)_10 \rightarrow (EAF)_{16}$$

$$5) (154^2)_10 \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 | 154^2 \\ 16 | 96 - 6 \\ 6 - 0 \end{array}$$

$$\Rightarrow 606$$

$$(154^2)_10 \rightarrow (606)_{16}$$

$$6) (175)_10 \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 | 175 \\ 10 - 15 \\ \downarrow \quad \downarrow \\ A \quad F \end{array}$$

$$= AF$$

$$(175)_10 \rightarrow (AF)_{16}$$

$$7) i) 105$$

$$(105)_10 \rightarrow (\quad)_{16}$$

$$\begin{array}{r} 16 | 105 \\ 6 - 9 \end{array}$$

$$= 69$$

$$\Rightarrow (105)_10 \rightarrow (69)_{16}$$

$$\text{i) } 450$$

$$(450)_{10} \rightarrow (\quad)_{16}$$

$$16 \overline{) 450}$$

$$16 \overline{) 28 - 2}$$

$$1 - 12 \Rightarrow C$$

$$= 1C2$$

$$\Rightarrow (450)_{10} \rightarrow (1C2)_{16}$$

$$\text{ii) } 199$$

$$(199)_{10} \rightarrow (\quad)_{16}$$

$$16 \overline{) 199}$$

$$\downarrow$$

$$= C7$$

$$(199)_{10} \rightarrow (C7)_{16}$$

$$\text{iv) } 3000$$

$$(3000)_{10} \rightarrow (\quad)_{16}$$

$$16 \overline{) 3000}$$

$$16 \overline{) 187 - 8}$$

$$11 - 11 \rightarrow B$$

$$\downarrow$$

$$B$$

$$= BB8$$

$$(3000)_{10} \rightarrow (BB8)_{16}$$

(8) Convert Base 10 to Base 8.

$$\text{i) } (1032)_{10} \rightarrow (\quad)_8$$

$$8 \overline{) 1032}$$

$$8 \overline{) 129 - 0}$$

$$8 \overline{) 16 - 1}$$

$$2 - 0$$

$$= 2010$$

$$\Rightarrow (1032)_{10} = (2010)_8$$

$$\text{ii) } (1032.6875)_{10} \rightarrow (?)_8$$

real part $(1032)_{10}$

$$\text{so, } (1032)_{10} = (2010)_8$$

Fractional Part :-

$$(0.6875)_{10} \rightarrow (\quad)_8$$

Multiplication Method

	Real Part	Fractional Part
0.6875×8	5	0.5
0.5×8	4	0.0

$$(0.6875)_{10} = (0.54)_8$$

we have

$$(1032.6875)_{10} = (2010.54)_8$$

$$i) (172)_{10} \rightarrow (?)_8$$

$$\begin{array}{r} 8 | 172 \\ 8 | 21 - 4 \\ \quad \quad 2 - 5 \end{array}$$

$$= 254$$

$$\text{here } \rightarrow (172)_{10} = (254)_8$$

$$ii) (172.878)_{10}$$

$$(172.878)_{10} \rightarrow (?)_8$$

Real part is $(172)_{10}$

$$\text{so, } (172)_{10} = (254)_8$$

Fractional part

$$(0.878)_{10}$$

Multiplication method.

	Real Part	Fractional Part
0.878×8	7	0.024
0.028×8	0	0.192
0.192×8	1	0.536
0.536×8	4	0.288

$$(0.878)_{10} = (0.7014)_8$$

we have

$$(172.878)_{10} = (254.7014)_8$$

$$10) \text{ Convert } (127)_{10} \text{ to octal.}$$

$$(127)_{10} \rightarrow (?)_8$$

$$\begin{array}{r} 8 | 127 \\ 8 | 15 - 7 \\ \quad \quad 1 - 7 \end{array}$$

$$= 177$$

$$(127)_{10} \rightarrow (177)_8$$

11) Identify the IP address class Identification.

i) 10.250.1.1

Limit of class A is - 1-126

So, 10.250.1.1 belong to class A.

ii) 193.42.1.1

Limit of class B is 128-191

So, 193.42.1.1, belong to class B.

iii) 249.240.80.78

Limit of class E is 240-254

So, 249.240.80.78 belong to class E.

12) IP address class Identification.

i) 215.45.45.0

Limit of class C is 192-223

So, 215.45.45.0 belong to class C.

ii) 33.0.0.0

Limit of class A is 1-126

So, 33.0.0.0 belong to class A

iii) 158.98.80.0

Limit of class B is 128-191

So, 158.98.80.0 belongs to class B.