Yash Gupta
S2000002239

1-1

(a)

(i)   speed up =

$$\frac{1}{(1 - fraction_{enchaned}) + \frac{f \ amount \ a \ enchand}{Amont \ of \ enchan}}$$

$$fraction \ enchand \ by \ flod = \frac{3 \times 4}{1 \times 10 + 3 \times 4 + 3 \times 8 + 4 \times 2} \times 100$$

$$= \frac{12}{54} = 0.223$$

→ fraction enchanced 22% = 0.2 $\}$ 1

fraction unaffected = 78% ($\because 100-22 = 78\%$)

Enchancment amount = 10 times

$$Speed \ up = \frac{1}{0.8 + \frac{0.2}{10}}$$

$$= \frac{1}{0.82}$$

Speed up = 1.2

Yash Gupta
52222222/22214

(iii) Speedup $=$ $\dfrac{\text{Execution time old}}{\text{Execution time new}}$

$$3 = \dfrac{1 \times 10 + 3 \times 9 + 3 \times 8 + 4 \times 2}{n}$$

$$\boxed{n = 18}$$

(iv) Speed $=$ Execution time

1(b) S-1   100 x's   100 y's   150 z's
      S-2   200 x's   100 y's   400 z's

X - 1cc
Y - 1cc
2 - 3cc

(a) Total cc in S-1 $=$ 650
     Total cc in S-2 $=$ 420

$$\dfrac{T_{S\cdot 1}}{T_{S-2}} = \dfrac{650 \times u}{420 \times u} = \dfrac{65}{42}$$

$$T_{S-2} < T_{S-1}$$

T_{S-2} will perform faster than T_{S-1}

Yash Gupta
S2o2oooloz3Y

1 (b)

Solution

T_{s-2} will perform $\dfrac{65}{42}$ on 1.54

times faster then T_{s-1}

(c) Average $CPI = \dfrac{\text{Total clock Cycles}}{\text{Total Instruction}}$

$CPI_{s-1} = \dfrac{650}{100 + 100 + 150} = 1.85$

$CPI_{s-2} = \dfrac{420}{200 + 100 + 40} = 1.235$

Yash Gupta
S20200010234

2(a) $(85.1)_{10}$

$0.1 \times 2 = 0.2$ 0

$0.2 \times 2 = 0.4$ 0

$0.4 \times 2 = 0.8$ 0

$0.8 \times 2 = 1.6$ 1

$0.6 \times 2 = 1.2$ 1

$0.2 \times 2 = 0.4$ 0

$0.4 \times 2 = 0.8$ 0

$0.8 \times 2 = 1.6$ 1

$0.6 \times 2 = 1.2$ 1

2	85	1
2	42	0
2	21	1
2	10	0
2	5	1
2	2	0
	1	1

$(85.1)_{10} = 1010101 . 0[0011]$

$= 1.010101 . 0[0011] \times 2^6$

Exponent $= 6 +$ Bias

$= 6 + 127$

$= 133$

0   1000 010   010 1010 0011 0011 0011 0011

Sign   Exponent   fraction

Yash Gupta
S2020001o234

2(b)

$ 4339 0000

010 0 00110 0111001

exponent = 13 9-127
= 8

1. 0111 001

$ 4282 0000

0100 00101 0000010

exponent   fraction

exponent = 133-127
= 6

1. 0111 001
1. 0000010

1. 0111011