Task:

A computer system is executing some floating point instructions. To improve the performance of the system, it has used floating point processor which is 10 times faster than others. To get the speed up of 5, how much percentage instructions should be of floating point type:

(a) 90%
(b) 60%
(c) 70%
(d) 50%

Solution:

Let percentage instructions of floating point type is X.

So speed increase is $\frac{100}{100-X+\frac{X}{10}}$.

Based on the task we get the equation: $\frac{100}{100-X+\frac{X}{10}} = 5$

$$\frac{100}{100 - X + \frac{X}{10}} = 5$$

$$\frac{100}{100 - \frac{9X}{10}} = 5$$

$$5(100 - \frac{9X}{10}) = 100$$

$$500 - \frac{9X}{2} = 100$$

$$\frac{9X}{2} = 400$$

$$9X = 800$$

$$X = 88.89$$

Answer: (a) 90%