Solution:

(1)

Let us tabulate all the transaction using LIFO, FIFO and weighted average method.

The table will look like as follows:

Date	*Sales Done*	*Final Inventory Value Under*		
		FIFO	LIFO	Average Method
31 Dec 2017	0	110 @ $50	110 @ $50	110 @ $50
10 Feb 2018	0	110 @ $50 80 @ $60	110 @ $50 80 @ $60	110 @ $50 80 @ $60 = 190 @ $54.21
14 Apr 2018	5,400	50 @ $50 80 @ $60	110 @ $50 20 @ $60	130 @ $54.21
9 May 2018	0	50 @ $50 80 @ $60 120 @ $70	110 @ $50 20 @ $60 120 @ $70	130 @ $54.21 120 @ $70.00 = 250 @ $61.79
14 July 2018	12,000	10 @ $60 120 @ $70	110 @ $50 20 @ $60	130 @ $61.79
21 Oct 2018	0	10 @ $60 120 @ $70 100 @ $80	110 @ $50 20 @ $60 100 @ $80	130 @ $61.79 100 @ $80 = 230 @ $69.70
12 Nov 2018	8,800	50 @ $70 100 @ $80	110 @ $50 20 @ $60 20 @ $80	150 @ $69.70
Total at the end	26,200	11,500	7,300	10,456

The table gives us the final inventory values. We can use them to calculate gross profits as follows:

$$Gross\ Profit = Sales - Cost\ of\ Goods\ Sold$$

$$= Sales - (Gross\ Purchase + Beginning\ Inventory - End\ Inventory)$$

So, we get

$$Gross\ Profit = 26{,}200 - (21{,}200 + 5{,}500 - End\ Inventory) = End\ Inventory - 500$$

Thus, we get

$$Gross\ Profit\ (FIFO) = 11{,}000$$

$$Gross\ Profit\ (LIFO) = \quad 6{,}800$$

$$Gross\ Profit\ (Avg.) = \quad 9{,}956$$

(2)

The difference would be given by:

$$Difference = Difference\ in\ income\ \times Tax\ rate = 4{,}200\ \times\ 0.4 = 1{,}680$$

Thus, the contractors could have saved almost $\$1{,}680$ if they have used LIFO instead of FIFO for stating income.

(Answer to 7-57)

If the 100 extra units had been purchased on 30 December, then the final inventory would increase by $8,000 for both. However, the gross purchase would also increase by $8,000. These two would cancel each other and result in no changes in net income & income taxes. This can be seen qualitatively, because the cost of goods sold remains unchanged on the purchase.