2·5·3. Ratio to Moving Average Method. As pointed out earlier, moving average eliminates periodic movements if the extent (period of moving average) is equal to the period of the oscillatory movements sought to be eliminated. Thus for a monthly data, a 12-month moving average should completely eliminate the seasonal movements if they are of constant pattern and intensity. The method of getting seasonal indices by moving average involves the following steps :

(*i*) Calculate the centred 12-month moving average of the data. These moving average values will give estimates of the combined effects of trend and cyclic variations.

(*ii*) Express the original data (except for 6 months in the beginning and 6 months at the end) as percentages of the centred moving average values. Using multiplicative model, these percentages would then represent the seasonal and irregular components.

(*iii*) The preliminary seasonal indices are now obtained by eliminating the irregular or random component by averaging these percentages. As discussed in § 2·5·2, Step (*iii*), either arithmatic mean or median (preferably median) can be used for averaging.

(*iv*) The sum of these indices = S (say) will not, in general, be 1,200 (or 400) for monthly (or quarterly) data. Finally, an adjustment is done to make the sum of the indices 1,200 (or 400) by multiplying throughout by a constant factor = 1,200/S (or 400/S), *i.e.*, by expressing the preliminary seasonal indices as the percentage of their arithmetic mean. The resultant gives the desired indices of seasonal variations.

Merits and Demerits. Of all the methods of measuring seasonal variations, the 'Ratio to the moving average 'method' is the most satisfactory, flexible and widely used method, for estimating the seasonal fluctuations in a time series because it irons out both trend and cyclical components from the indices of seasonal variations.

However, an obvious drawback of this method is that there is loss of some trend values in the beginning and at the end and accordingly seasonal indices for first six months (or 2 quarters) of the first year and last six months (or 2 quarters) of the last year cannot be determined.

Example 2·17. *Apply ratio to moving average method to ascertain seasonal indices from the following data :*

Year and Month 2002	No. of persons visiting a place of interest	Year and Month 2003	No. of persons visiting a place of interest	Year and Month 2004	No. of persons visiting a place of interest
Jan.	90	Jan.	100	Jan.	110
Feb.	85	Feb.	89	Feb.	93
March	70	March	74	March	78
April	60	April	62	April	66
May	55	May	55	May	58
June	45	June	47	June	40
July	30	July	30	July	35
Aug.	40	Aug.	43	Aug.	45
Sept.	70	Sept.	65	Sept.	72
Oct.	120	Oct.	127	Oct.	130
Nov.	115	Nov.	118	Nov.	118
Dec.	118	Dec.	120	Dec.	124

Solution.

TABLE 2·20 : COMPUTATION OF MOVING AVERAGES

Year & Month		No. of persons visiting a place of interest	12-point moving totals	12-point M.A.	12-point M.A. centered	Ratio to M.A.
	(1)	(2)	(3)	(4) = (3) ÷ 12	(5)	[(2) ÷ (5)] × 100
2002	Jan.	90				
	Feb.	85				
	March	70				
	April	60				
	May	55				
	June	45				
			898	74·83		
	July	30			75·3	39·8
			908	75·67		
	Aug.	40			75·8	52·8
			912	76·00		
	Sept.	70			76·2	91·9
			916	76·33		
	Oct.	120			76·4	157·1