Unit II

Index numbers

Section-A

One mark questions:

1. In index number what is meant by base year? (K)
2. In index number what is meant by current year? (K)
3. Define price relative. (U)
4. Write the formula of price relative. (U)
5. Write the formula of quantity relative. (U)
6. What is the value of index number for the base year? (K)
7. If the price during the current year is triple the price during the base year, what is the value of price relative? (K)
8. If the price relative is 175, what would you conclude? (A)

9. If the general price level goes up by 80% between 2000 and 2012, what is the index number for 2012 with base 2000? (K)
10. If the quantity index number for current year is 80, then what would you conclude? (A)
11. Mention a characteristic of index numbers. (K)
12. Mention a use of index numbers. (K)
13. Mention a limitation of index numbers. (K)
14. Define price index number. (U)
15. Mention two steps involved in the construction of index numbers. (K)
16. Name the common average used in the construction of index numbers. (K)
17. Which average is considered as the best average in the construction of index number? (K)
18. Why GM is considered as the best average in the construction of index number? (K)
19. What is simple aggregative price index number? (K)
20. Write down the formula of simple aggregative price index number. (U)
21. Write down the formula of simple arithmetic mean price index number. (U)
22. Write down the formula of simple geometric mean price index number. (U)
23. Write down the formula of weighted arithmetic mean price index number. (U)
24. Write down the formula of weighted geometric mean price index number. (U)
25. Write down the formula of Laspeyre's price index number. (U)
26. Which weight is used in the construction of Laspeyre's price index number? (K)
27. Write down the formula of Paasche's price index number. (U)
28. Which weight is used in the construction of Paasche's price index number? (K)
29. Write down the formula of Marshall-Edgeworth's price index number. (U)
30. Which system of weight is used in the construction of Marshall-Edgeworth's price index number? (K)
31. State the relation between Laspeyre's, Paasche's and Dorbish–Bowley's index numbers. (U)
32. Write down the formula of Dorbish – Bowley's price index number. (U)
33. State the relation between Laspeyer's, Paasche's and and Fisher's index numbers. (U)
34. Write down the formula of Fisher's price index number. (U)
35. Write down the formula for Kelly's fixed weight price index number. (U)
36. Which weight is used in the construction of Kelly's price index number? (K)
37. Write down the formula of Laspeyre's quantity index number. (U)
38. Which weight is used in the construction of Laspeyre's quantity index number? (K)
39. Write down the formula of Paasche's quantity index number. (U)
40. Which weight is used in the construction of Paasche's quantity index number? (K)
41. Write down the formula of Marshall-Edgeworth's quantity index number. (U)
42. Which system of weight is used in the construction of Marshall-Edgeworth's quantity index number? (K)
43. Write down the formula of Dorbish – Bowley's quantity index number. (U)
44. Write down the formula of Fisher's quantity index number. (U)
45. Write down the formula of value index number. (U)
46. What do you mean by unit test? (K)
47. Name the index number which does not satisfy unit test. (K)
48. State the condition required to satisfy Time Reversal Test (TRT). (U)

49. Name the index number which satisfies TRT. (K)
50. Does Marshall - Edgeworth's index number satisfies TRT? (K)
51. State the condition required to satisfy Factor Reversal Test (FRT). (U)
52. Name the index number which satisfies FRT. (K)
53. Does Marshall - Edgeworth's index number satisfies FRT? (K)
54. Name the index number which satisfies both TRT and FRT. (K)
55. State the condition required to satisfy circular test. (U)
56. Name the index number which satisfies circular test. (K)
57. Which index number shows upward bias? (K)
58. Why Laspeyre's price index number shows upward bias? (K)
59. Which index number shows downward bias? (K)
60. Why Paasche's price index number shows downward bias? (K)
61. Is Marshall - Edgeworth's index number free from bias? (K)
62. Why Fisher's index number is free from bias? (K)
63. Define consumer price index number (cost of living index number). (U)
64. Write a use of consumer price index number. (K)
65. Which price of the commodities is used in the construction of cost of living index number? (K)
66. State a method used to compute consumer price index number. (K)
67. Write the formula for computing CPI by aggregative expenditure method. (U)
68. Write the formula for computing CPI by family budget method. (U)

Section-B

Two mark questions:

69. Define an index number. (U)
70. Why index numbers are known as 'economic barometers'? (K)
71. In index number what is meant by base year and current year? (K)
72. State two characteristics of index numbers. (K)
73. State two uses of index numbers. (K)
74. State two limitations of index numbers. (K)
75. If price relative is 140 and the price of a commodity in the base year is Rs. 60, then find the price in the current year. (U)
76. If quantity relative is 250 and the quantity produced in the current year is 120, then find the quantity produced in the base year. (K)
77. Mention four steps involved in the construction of general price index number. (K)
78. Which average is considered as the best average in the construction of index number? Why? (K)
79. State two norms (considerations) for the selection of base year. (K)
80. Calculate price Index number for the following data by using simple aggregative method. (A)

Commodity		Wheat per (kg.)	Rice per (kg.)	Pulses per (kg.)	Milk per (litres)	Clothing per (metre)	Total
Price (Rs.)	2010	20	31	40	14	20	125
	2012	23	33	44	20	30	150

81. Find price Index number for the following data by using simple aggregative method. (U)

Item	A	B	C	D	E	Total
Base year price	20	8	10	30	12	80
Current year price	25	8	12	40	15	100

82. The sum of price relatives of 5 different commodities is 200. Find a suitable un-weighted price index number. (K)
83. Given, $\Sigma p_1q_0 = 1980$ and $\Sigma p_0q_0 = 1800$. Calculate a suitable index number. (A)
84. Given, $\Sigma q_0p_0 = 750$ and $\Sigma q_0p_1 = 900$. Calculate a suitable price index number. (A)
85. Given, $\Sigma q_1p_1 = 2300$ and $\Sigma q_1p_0 = 2000$. Calculate a suitable price index number. (A)
86. Given, $\Sigma p_0q_1 = 300$ and $\Sigma p_1q_1 = 375$. Calculate a suitable index number. (A)
87. If $\Sigma p_1q = 450$ and $\Sigma p_0q = 400$, find Kelly's price index number. (U)
88. Given, $\Sigma p_1q = 672$ and $\Sigma p_0q = 600$. Calculate a suitable index number. (A)
89. If Laspeyre's price index number $\left(P_{01}^{L}\right) = 120$ and Paasche's price index number $\left(P_{01}^{P}\right) = 122$, find Dorbish – Bowley's price index number $\left(P_{01}^{DB}\right)$. (U)
90. Given, $P_{01}^{L} = 220$ and $P_{01}^{DB} = 228$, find P_{01}^{P}. (U)
91. If $P_{01}^{P} = 224$ and $P_{01}^{DB} = 226$, find P_{01}^{L}. (U)
92. Given, $P_{01}^{L} = 120$ and $P_{01}^{P} = 122$, find P_{01}^{F}. (U)
93. If $P_{01}^{L} = 101.6$ and $P_{01}^{F} = 99.6$, find P_{01}^{P}. (U)
94. Given, $P_{01}^{P} = 110$ and $P_{01}^{F} = 106.96$, find P_{01}^{L}. (U)
95. Given, $\Sigma p_0q_0 = 5000$ and $\Sigma p_0q_1 = 4000$. Calculate a suitable quantity index number. (A)
96. Given, $\Sigma q_1p_0 = 3920$ and $\Sigma q_0p_0 = 4000$. Calculate a suitable index number. (A)
97. Given, $\Sigma p_1q_0 = 2000$ and $\Sigma p_1q_1 = 1800$. Calculate a suitable quantity index number. (A)
98. Given, $\Sigma q_1p_1 = 14250$ and $\Sigma q_0p_1 = 1500$. Calculate a suitable index number. (A)
99. Given, Laspeyre's quantity index number $\left(Q_{01}^{L}\right) = 96$ and Paasche's quantity index number $\left(Q_{01}^{P}\right) = 98$, find Dorbish – Bowley's quantity index number $\left(Q_{01}^{DB}\right)$. (U)
100. If $Q_{01}^{P} = 100$ and $Q_{01}^{DB} = 98$, find Q_{01}^{L}. (U)
101. Given, $Q_{01}^{L} = 92$ and $Q_{01}^{DB} = 96$, find Q_{01}^{P}. (U)
102. If $Q_{01}^{L} = 98$ and $Q_{01}^{P} = 100$, find Q_{01}^{F}. (U)
103. Given, $Q_{01}^{L} = 92$ and $Q_{01}^{F} = 95$, find Q_{01}^{P}. (U)
104. If $Q_{01}^{P} = 95$ and $Q_{01}^{F} = 97$, find Q_{01}^{L}. (U)
105. Given, $\Sigma p_0q_0 = 4200$ and $\Sigma p_1q_1 = 5000$. Calculate a suitable index number. (A)
106. If the total value in the base year and current year are respectively 800 and 1000. Compute value index number. (A)
107. State the conditions required to satisfy TRT and FRT. (U)
108. Explain TRT. (U)
109. Explain FRT. (U)
110. Why Fisher's index number is called as an 'Ideal index number'? (K)
111. Write down the steps involved in the construction of consumer price index number. (K)
112. Write down two uses of consumer price index number. (K)

113. Given, $\Sigma p_1 q_0 = 3500$ and $\Sigma p_0 q_0 = 3250$. Calculate a suitable consumer price index number. (K)

114. Find consumer price index number from the following data. (U)

Group	A	B	C	D
Group Index	100	120	130	110
Weight	2	3	1	4

115. Calculate cost of living index number from the following data. (A)

Group	Food	Education	Rent	Fuel	Clothing
Group Index	110	120	112	108	105
Weight	3	8	4	6	9

116. Calculate cost of living index number from the following data. (A)

Group	Food	Clothing	Rent	Fuel	Misc.
Weight in %	40	25	15	5	15
Group Index	120	90	100	105	95

Section-C

Five mark questions:

117. What is an index number? Write its three uses. (K)

118. Write down three uses and two limitations of index numbers. (K)

119. What are the steps involved in the construction of index number? Explain any two. (K)

120. Explain briefly the steps involved in the construction of cost of living index number. (U)

121. Following are the prices (in Rs.) of items in 2010 and 2015. Calculate simple arithmetic mean price index number. Comment on the result. (A)

Item		A	B	C	D	E	F
Price (Rs.)	2010	50	60	20	50	80	125
	2015	55	75	30	75	90	130

122. The following are the prices (in Rs.) of items in 2010 and 2015. Find simple geometric mean price index number. (U)

Item		A	B	C	D	E	F
Price (Rs.)	2010	50	60	20	50	80	125
	2015	55	75	30	75	90	130

123. Calculate simple geometric mean price index number for the following data. (A)

Item		A	B	C	D	E
Price (Rs.)	Base year	24	40	20	16	50
	Current year	30	35	24	16	60

124. Find simple geometric mean price index number for the following data. (U)

Item		A	B	C	D
Price (Rs.)	Base year	20	30	50	150
	Current year	28	27	40	180

125. For the following data calculate the weighted arithmetic mean price index number. (A)

Commodity		Wheat	Gram	Rice	Pulses
Price (Rs.)	2005	50	60	20	50
	2010	55	75	30	75
Weight		4	2	3	1

126. Find the weighted A.M price index number from the following data. (U)

Item		A	B	C	D	E
Weight in %		25	10	20	15	30
Price (Rs.)	2000	120	30	50	25	40
	2005	100	30	40	20	50

127. Calculate the weighted A.M price index number from the following data. (A)

Item		A	B	C	D
Weight		5	4	8	3
Price (Rs.)	2005	6	15	8	12
	2010	18	27	12	24

128. Find weighted G.M. price index number from the following data. (U)

Item		A	B	C	D	E
Weight in %		30	15	20	10	25
Price (Rs.)	Base year	100	20	70	20	40
	Current year	90	20	60	15	55

129. Calculate the weighted geometric mean price index number for the following data. (A)

Item		Stereo	Television	Radio
Price Rs/ Unit	Base year	20,000	15,000	500
	Current year	25,000	20,000	800
Weight		30	50	20

130. Find the weighted G.M price index number from the following data. (U)

Item	Weight	p_0	p_1
A	25	120	222
B	10	40	80
C	15	100	300
D	10	100	200
E	50	300	500

131. By using the following data compute suitable index number and comment on the result. (A)

Item	Base year Quantity	Price (Rs.)	
		Base year	Current year
A	20	8	4
B	40	12	10
C	40	20	15
D	50	40	25
E	50	50	10

132. Calculate Laspeyre's price index number for the following data and give your conclusion. (A)

Item	Price in 2004	Price in 2006	Expenditure in 2004
A	5	7	30
B	4	3	16
C	6	8	48
D	8	10	72
E	2	1	4

133. Compute suitable index number from the following data and comment on the result. (A)

Item	p_0	p_1	q_1
I	5	6	30
II	3	4	15
III	4	5	18
IV	2	2	10

134. For the following data compute Paasche's price index number and comment on the result. (A)

Item	Base year price	Current year quantity	Current year expenditure
A	10	6	72
B	15	10	160
C	20	4	68
D	25	5	150

135. Compute Kelly's price index numbers for 2005 from the following data. Comment on the result. (A)

Item	Price (Rs.)		Quantity
	2000	2005	
A	15	22	15.5
B	20	27	12.5
C	4	7	7.5
D	10	20	7.5

136. Calculate Kelly's price index number from the following data. Comment on the result. (A)

Item	No. of units sold	Price (Rs.)	
		Base year	Current year
A	22	25	30
B	40	60	75
C	35	100	110
D	45	70	90

137. Compute Kelly's price index number for the following data. Comment on the result. (A)

Item	Price (Rs.)		Quantity of consumption
	2010	2012	
A	10	12	20
B	16	18	15
C	9	10	10
D	11	14	25

138. Compute Kelly's price index number for the following data. Comment on the result. (A)

Item	A	B	C	D
p_0	14	22	10	8
p_1	15	24	12	10
q	5	4	10	12

139. Compute suitable index number from the following data. Comment on the result. (A)

Item	Unit	Quantity		Price in 1990
		1990	1995	
A	kg	150	160	10
B	kg	90	100	12
C	meter	60	60	15
D	packets	50	40	9

140. Compute suitable index number from the following data. Comment on the result. (A)

Item	p_0	q_0	q_1
I	30	6	5
II	15	4	3
III	18	5	4
IV	10	2	2

141. Calculate suitable index number from the following data. Comment on the result. (A)

Item	Current year price	Quantity	
		Base year	Current year
A	30	8	10
B	45	10	15
C	100	7	10
D	22	20	25

142. For the following data verify whether Laspeyre's price index number satisfies TRT. (S)

Item	Price		Quantity	
	2010	2011	2010	2011
A	9	8	3	4
B	20	21	9	10
C	10	15	6	5

143. For the following data verify whether Paasche's index number satisfies FRT. (S)

Item	Base year		Current year	
	Price (Rs.)	Expenditure (Rs.)	Price (Rs.)	Expenditure (Rs.)
A	4	16	6	12
B	6	24	4	32
C	8	40	10	30

144. For the following data show that Marshall-Edgeworth's price index number satisfies TRT. (S)

Item	Base year		Current year	
	Price	Quantity	Price	Quantity
A	4	4	6	2
B	6	4	4	8
C	8	5	10	3

145. From the following data compute value index number for the year 2010 on the basis of 2008. Comment on the result. (A)

Item	2008		2010	
	Price (in Rs.)	Quantity	Price (in Rs.)	Quantity
A	9	10	10	11
B	10	9	11	10
C	7	8	8	10
D	15	8	15	9

146. For the following data compute value index number for the current year. Comment on the result. (A)

Item	Base year		Current year	
	Price	Quantity	Price	Quantity
A	5	25	6	30
B	10	5	15	4
C	3	40	2	50
D	6	30	8	35

147. For the following data find the consumer price index number for the year 2012 with respect to the base year 2005 by aggregative expenditure method. (U)

Commodity	Unit	No. of units (quantities) in 2005	Price (in Rs. per unit)	
			2005	2012
Rice	quintal	2	1600	3800
Dhal	quintal	0.2	2100	6400
Sugar	kg	30	15	32
Tea	kg	3	60	100
Miscellaneous	monthly	12	2000	3000

148. Calculate the cost of living index number by aggregative expenditure method. (A)

Commodity	Base year		Current year price (in Rs.)
	Price (in Rs.)	Quantity	
Wheat	26	40	30
Pulses	48	5	60
Salt	2	4	2.5
Oil	150	15	170
Others	1000	6	1400

149. For the following data find consumer price index number by aggregative expenditure method. (U)

Item	No. of units (quantities) in 2010	Price per unit in Rs.	
		2010	2015
A	100	8	12
B	25	6	7
C	10	5	5
D	20	48	52
E	25	15	16
F	30	9	27

150. For the following data calculate the cost of living index number by aggregative expenditure method. (S)

Commodity	Base year		Current year price (in Rs.)
	Price (in Rs.)	Expenditure (in Rs.)	
Rice	12	960	17
Sugar	24	360	30
Tea	200	400	300
Pulses	40	200	50
Fuel	500	4000	600
Others	1000	20000	2500

151. For the following data calculate the cost of living index number by family budget method. (A)

Group	Weight	Price (in Rs.)	
		Base year	Current year
Food	10	2000	2500
Housing	5	800	1200
Clothing	3	400	500
Fuel	7	500	700
Miscellaneous	5	800	1000

152. For the following data calculate the cost of living index number by family budget method. (A)

Group	Price (in Rs.)		Weight
	Base year	Current year	
Food	130	170	30
Clothing	50	60	12
Fuel	90	110	8
Entertainment	30	50	15
Medicine and Education	40	70	10
Others	50	90	15

153. For the following data calculate the cost of living index number. (A)

Group	Price (in Rs.)		Weight
	Base year	Current year	
Food	2000	2500	10
Clothing	800	1200	4
Housing	2500	3000	12
Fuel	500	400	8
Miscellaneous	800	1000	6

154. For the following data calculate the cost of living index number. (A)

Group	Price (in Rs.)		Weight
	2010	2014	
Food	2000	3000	30
Clothing	1200	900	8

Housing	4000	5000	12
Fuel	1000	800	15
Miscellaneous	1500	1800	25

155. For the following data calculate the consumer price index number by family budget method. (A)

Group	Price (in Rs.)		Weight
	2005	2010	
Food	3000	3600	10
Housing	4000	5000	12
Clothing	2000	1600	5
Fuel	1000	1400	15
Miscellaneous	1200	1500	5

156. For the following data calculate the cost of living index number for 2012 with base 2010 by family budget method. (A)

Group	Price (in Rs.)		Weight
	2010	2012	
Food	2500	2600	30
Clothing	800	1000	13
Housing	2000	2500	12
Fuel	800	1100	15
Misc.	1400	1750	10

157. Family budget enquiry revealed that the average expenditure of the families on food, clothing, house rent, fuel and misc. are 30%, 10%, 20%, 20%, and 20% respectively. If the respective group indices are 130, 170, 160, 200 and 180. Find the consumer price index number. Comment on the result. (U)

158. A family budget enquiry revealed that the average expenditure on various items are 35%, 10%, 15%, 10% and 30% on food, cloth, house rent, fuel and miscellaneous respectively. If the respective group indices for 2010 with base 2005 are 150, 130, 190, 200 and 160. Find the consumer price index for 2010 with base 2005. Comment on the result. (U)

159. Family budget enquiry revealed that the average expenditure of the families on food, clothing, house rent, fuel and misc. are 30%, 10%, 20%, 15%, and 25% respectively. If the respective group indices are 160, 170, 150, 220 and 200. Find the consumer price index number. Comment on the result. (U)

160. By using the following group indices and group weights compute consumer price index number for the years 2008 and 2012 with base 2001. And compare them. (A)

Group	Group index with base 2001		Group weights
	2008	2012	
Food	140	210	32
Clothing	220	300	10
Fuel and lighting	125	140	5
Housing	150	200	12
Miscellaneous	135	160	11

161. The group indices and the corresponding weights for the working class in an industrial town for the years 2010 and 2015 with base 2005 are given below. Calculate consumer price index numbers and compare them. (A)

Group	Group weights	Group Index with base 2005	
		2010	2015
Food	60	370	380
Clothing	8	420	500
Fuel	10	470	340
House Rent	12	110	120
Misc.	10	280	282

Section-D

Ten mark questions:

162. Find Laspeyre's, Paasche's and Fisher's price index numbers for 2000 from the following data. (U)

Item	1995		2000	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

163. From the following data compute Marshall-Edgeworth's and Dorbish-Bowley's price Index numbers. (A)

Item	Price (in Rs.)		Quantity	
	Base year	Current year	Base year	Current year
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	30	24
E	8	12	40	36

164. Find Laspeyre's, Paasche's and Dorbish-Bowley's price index numbers for the following data. (U)

Item	2004		2008	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	10	5	12	4
B	15	8	18	7
C	6	3	4	5
D	3	4	3	5

165. From the following data compute Marshall-Edgeworth's and Fisher's price Index numbers. (A)

Item	Price (in Rs.)		Quantity	
	Base year	Current year	Base year	Current year
A	10	12	60	60

B	4	5	100	90
C	5	6	70	80
D	6	6	60	40

166. From the following data find Laspeyre's, Paasche's and Marshall-Edgeworth's price Index numbers. (U)

Item	Base year		Current year	
	Price (Rs.)	Expenditure (Rs.)	Price (Rs.)	Expenditure (Rs.)
A	5	25	10	60
B	1	10	2	24
C	4	14	8	40
D	2	40	5	75

167. From the following data compute Dorbish-Bowley's and Fisher's price Index numbers. (A)

Item	Price (Rs.)		Expenditure (Rs.)	
	Base year	Current year	Base year	Current year
1	2	5	50	60
2	4	8	20	48
3	1	2	8	20
4	5	10	30	70

168. Find Laspeyre's, Paasche's and Fisher's quantity index numbers from the following data. (U)

Item	Base year		Current year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	4	15	6	10
B	3	20	4	25
C	6	10	5	20
D	5	30	5	25

169. Compute Marshall-Edgeworth's and Dorbish – Bowley's quantity index numbers from the following data. (A)

Item	Base year		Current year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	2	40	6	50
B	4	50	8	40
C	6	20	9	30
D	8	10	6	20
E	10	10	6	20

170. For the following data, find a) Laspeyre's price index number b) Paasche's quantity index number and c) Value index number. (U)

Item	2009		2010	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	10	7	11	11
B	5	9	10	5
C	6	5	5	9

171. Prices paid and quantities consumed during two time periods are

Item	Period - I		Period - II	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	10	2	15	1
B	15	3	10	3
C	20	4	15	4

Compute

a. Price index number by considering quantity of period-I as weight.

b. Quantity index number by considering the price of period-II as weight.

c. Value index number. (A)

172. For the following data show that Fisher's index number satisfies both time reversal and factor reversal tests. (S)

Item	2004		2006	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	8	15	9	15
B	7	12	8	13
C	10	10	10	10
D	12	14	15	16

173. For the following data verify whether Fisher's index number satisfies TRT and FRT. (S)

Item	Price (Rs.)		Quantity	
	Base year	Current year	Base year	Current year
A	4	6	4	2
B	6	4	4	8
C	8	10	5	3

174. For the following data verify whether Marshall-Edgewroth's index number satisfies TRT and FRT. (S)

Item	Base year		Current year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	4	4	6	2
B	6	4	4	8
C	8	5	10	3

175. Using the following data verify whether

a. Lespeyre's index number satisfies FRT

b. Marshall-Edgewroth's price index number satisfies TRT. (S)

Commodity	Base year		Current year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
Rice	40	20	45	22
Wheat	25	16	30	15
Oil	95	8	95	9
Fish	110	10	120	10
Milk	20	6	30	7