NC-131

December-2015

F.Y. M.B.A. Integrated

Basic Statistics

Time : 3 Hours]   **[Max. Marks : 100**

Instructions : (1)   Graph papers and log tables shall be provided on demand.

                  (2)   Non-programmable scientific calculators are allowed.

                  (3)   Answer the questions neatly in sequence.

1.   Attempt any **two** :   **20**

    (a)   What are the various methods of collecting statistical data ? Which of these is most reliable and why ?   **10**

    (b)   Present the following information in a tabular form :

        In 2001, out of a total of 4000 workers in a factory, 3300 were members of a trade union. The number of women workers employed was 500 out of which 400 did not belong to the union. In 2000, the number of workers in the union was 3450 of which 3200 were men. The number of non-union workers was 760 of which 330 were women.   **10**

    (c)   Represent the data relating to consolidated budgetary position of states in India as given below, on a graph paper :

Year	Revenue	Expenditure
1955-56	560.1	626.4
1956-57	577.0	654.3
1957-58	750.6	677.3
1958-59	782.1	786.6
1959-60	833.9	829.9

        Also depict graphically, the net balance of trade.   **10**

2.   Attempt any **two** :   **20**

    (a)   (i)   The mean of the following frequency distribution is 50. But the frequencies f_1 and f_2 in classes 20-40 and 60-80 are missing. Find the missing frequencies.

Class :	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency :	17	f_1	32	f_2	19

           Total Frequency = 120   **5**

(ii)   B.Com III year has three sections A, B and C with 50, 40, 60 students respectively. The mean marks of the three sections were determined as 85, 60 and 65 respectively. However marks of a student of section A were wrongly recorded as 50 instead of zero. Determine the mean marks of all the three sections put together.   **5**

(b)   The following table gives the frequency distribution of the marks of 800 candidates in an examination :

Marks	No. of Candidates
0 – 10	10
10 – 20	40
20 – 30	80
30 – 40	140
40 – 50	170
50 – 60	130
60 – 70	100
70 – 80	70
80 – 90	40
90 – 100	20

(i)   If the minimum marks required for passing are 35, what percentage of the candidates pass the examination ?

(ii)   Find the median of the distribution.   **10**

(c)   (i)   A railway train runs for 30 minutes at a speed of 40 miles an hour and then, because of repairs of the track runs for 10 minutes at a speed of 8 miles an hour, after which it resumes its previous speed and runs for 20 minutes except for a period of 2 minutes when it had to run over a bridge with a speed of 30 miles per hour. What is the average speed ?   **5**

(ii)   The weighted geometric mean of the four numbers 9, 25, 17 and 30 is 15.3. If the weights of the first three numbers are 5, 3 and 4 respectively, find the weight of the fourth number.   **5**

3.   Attempt any **two** :   **20**

(a)   The following distribution gives the difference in age between husband and wife in a particular community :

Difference in years :	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency :	449	705	507	281	109	52	16	4

Calculate mean deviation about median from these data.   **10**

(b) Two brands of plastic bags are tested for their strength. A sample of 100 bags of each brand is taken and the pressure at which they burst is recorded. The results are presented in the following table :

Pressure (in lbs)	Number of Bags	
	Brand A	Brand B
40 – 50	4	3
50 – 60	12	15
60 – 70	28	20
70 – 80	32	30
80 – 90	14	18
90 – 100	8	10
100 – 110	2	4

Which brand of bags appears to have greater uniformity in the bursting pressure ?　　**10**

(c) A survey of sales made by 230 firms in light engineering goods industry during the year 2012 revealed the following information :

Sales (in lakhs of ₹)	No. of Firms
70 – 80	12
80 – 90	18
90 – 100	35
100 – 110	42
110 – 120	50
120 – 130	45
130 – 140	20
140 – 150	8

Calculate moments about 115. Obtain central moments, Beta coefficients and comment on the nature of the distribution.　　**10**

4. Attempt any **four** :　　**20**

(a) Why Fisher's Index Number is called Ideal Index Number ?　　**5**

(b) The price quotations of four different commodities for 1990 and 1995 are given below. Calculate the index number of 1995 with 1990 as base by using weighted average of price relatives.　　**5**

Commodity	Weight	Price in Rupees	
		1995	1990
A	5	4.50	2.00
B	7	3.20	2.50
C	6	4.50	3.00
D	2	1.80	1.00

(c) Prepare a spliced series of index numbers with 2005 as base from the following series : **5**

Year	:	2000	2001	2002	2003	2004	2005	2006
Index A	:	100	115	109.25				
Index B	:			100	125	131.25	139.125	
Index C	:						100	135

(d) Calculate the chain base index number chained to 1999 from the average price of following three commodities : **5**

Commodity	1999	2000	2001	2002	2003
Wheat	4	6	8	10	12
Rice	16	20	24	30	36
Sugar	8	10	16	20	24

(e) (i) The price index number for 2012 with 2005 as the base year is calculated to be 133.333. How much change in purchasing power of rupee has taken place during this period ?

(ii) The sales made by a retailer in 2008 were ₹ 8,50,000 when the retail price index stood at 120. During 2012, the sales were recorded as ₹ 14,80,000 while the index increased to 192. How much change has taken place in the sales of the retailer in real terms. **5**

5. Attempt any **two** : **20**

(a) Find the area of the triangle region bounded by the lines whose equations are $x - y + 2 = 0$, $4x + 3y + 8 = 0$ and $9x - 2y - 17 = 0$. **10**

(b) Find the equation of the straight line passing through the point (4, 5) and the sum of its intercepts on the axes is 18. **10**

(c) Find the orthocentre of the triangle formed by the straight lines $x - y = 5$, $2x - y = 8$ and $3x - y = 9$. **10**

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