Quantitative Methods I-Y(A/F)

Feb

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11/02/09

TIME : MARKS :

N.B. : 1) All questions are compulsory.
2) Each question carries equal marks.
3) Only simple Calculators are allowed.
4) Figures to the right indicate full marks.

Q.1 a) The following data give the coded price (x) and demand (y) of a commodity : 06

(3, 7) , (8, 15) , (9, 12) , (7, 15) , (8, 14) , (10, 12) , (9, 13) , (8, 16) , (10, 12) , (12, 12) , (15, 14) , (14, 15) , (4, 10) , (2, 15) , (3, 9) , (5, 12) , (6, 13) , (6, 17) , (10, 15) , (7, 11) , (8, 15) , (10, 14) , (15, 12) , (14, 10) , (16, 10)

Prepare a bivariate frequency table taking class intervals 0 - 4, 5 - 9, ... etc. for x and 5 - 8, 9 - 12 etc. for y. Construct the marginal frequency tables for x and y. Also construct the conditional frequency table for x given y > 12.

b) Define i) Median
ii) Mode.
iii) Weighted Mean 06

c) The mean of a certain number of observations is 40. If two more items with the values 50 & 64 are added to the data the mean rises to 42. Find the number of items in the original data. 03

OR

Q.1 a) Find the missing frequency given that the arithmethic mean of advertising expenditure is Rs. 5625. 03

Advt. expenditure in Rs.	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000	7000-8000
No. of companies	10	15	30	-	65	25

b) For the following data which gives the profit of 30 companies in the last year. Prepare frequency distributiion using Stug's formula. 06

(Profit (in '000 Rs))

42	74	40	60	75	41
53	110	76	84	56	78
68	69	104	80	59	54
66	49	77	90	69	42
72	50	78	52	78	51

Also plot histogram for this distribution.

c) Draw a pie-diagram. for the following data & answer the questioins given below. 06

	Private Sector. I th Plan	Investment (%) 8th Plan.
Agriculature & allied	20.2	22.2
Industry & minerals.	37.0	34.9
Others	42.8	42.9
Total	100.0	100.0

(i) Which plan shows higher investment in industry & minerals?
(ii) Which part of investment is almost the same in the last two years?

Q.2 a) Find merits & demerits of median. 04

b) Find the geometric mean of the following raw data. 05

b) From the following distribution, calculate Q_1 & Q_3. 06

Also calculate the number of persons who have their income between Rs.330 & Rs.560.

Income In Rs.	100-200	200-300	300-400	400-500	500-600	600-700
No. of persons	120	200	170	220	100	90

c) Find weighted mean for the following. 05

x i :	12.5	18.5	22.5	16.5	28.5
wi :	10	12	12	16	20.

Q.3 a) Define i) Standard deviation 04

ii) Factor reversal test of price index nomber

b) Calculate the standard deviation of the heights of 40 babies given below. 06

Height in cms.	10-12	12-14	14-16	16-18	18-20.
No. of babies.	9	12	10	8	1

c) Calculate the quartile deviation for the following data giving the wages of 200 workers. 05

Wages in Rs.	1000-1200	1200-1400	1400-1600	1600-1800	1800-2000	2000-2200
No.of Workers.	20	40	60	50	20	10

OR

Q.3 a) Define : i) Cost of living index number. 04

ii) Value index number. 04

b) Define : i) Marshall - Edgeworth Index Number 06

ii) Dorbish - Bowley Index Number.

c) Find derivative w.r.t. x using first principle where. 05

$$f(x) = \frac{1}{x^2 + 1}$$

Q.4 a) Find variance & s.d. of following data. 05

C.I.	10-12	12-14	14-16	16-18	18-20
f.	9	12	10	8	1

b) Calculate laspeyre's & Paasche's index numbers for the year 1998 with the base 1995 06

from the following data. Also find Marshal-Edgeworth & Dorbish - Bowleys index numbers.

Commodity	1995		1998	
	Price	Quantity	Price	Quantity
A	12	25	15	28
B	10	20	15	25
C	4	15	6	12
D	6	20	9	15

c) Fill in the blanks. 04

i) If $y = 3x + 4$ then $\frac{d^2y}{dx^2}$ = _____

ii) If $y = \log x + 5x + ex + x^5$ then $\frac{dy}{dx}$ = _____

iii) Derivative of a constant number is _____

iv) If $y = (2x + 3)\sqrt{x}$ then $\frac{d^3y}{dx^3}$ = _____

OR

Q.4 a) Find haspeyre's, Paasche's & Fisher's index numbers from the following data for the year 1995 with base 1990 06

Commodity	Price in Rs.		Quantity	
	1990	1995	1990	1995
A	10	12	20	22
B	13	13	23	24
C	16	18	20	18
D	20	18	5	6
E	18	20	7	8

b) From the following data fine the missing value given that the haspeyre's index number is 120. Hence fine Paasche's index number. 05

Commodity	A	B	C	D
Po	9	8	4	1
qo	5	5	9	4
P_1	10	8	-	1. 5
Q_1	4	6	8	4

c) Find derivative w.r.t. x, if i) $y = 5x^2 - 7x + \frac{2}{\sqrt{x}} - 2$ 04

ii) $y = 3\sqrt{x} + \frac{4}{\sqrt{x}} + \sqrt{5} - \sqrt{\frac{5}{x}}$