

FY BIZ

CODE : FLUORIDE

oct 2008

Time : 2 Hrs.

G.M.D.

Marks : 60

- Instructions :
- 1] All questions are compulsory .
 - 2] Each question carries equal marks.
 - 3] Only simple calculators are allowed.
 - 4] Log tables will be supplied on request.

Q.1 a) Define (i) Arithmetic mean for grouped data

ii) Mode for grouped data

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b) Following data gives income distribution of some families

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Income (in '000 Rs.)	No. of families
30 - 34	5
34 - 38	8
38 - 42	14
42 - 46	10
46 - 50	3

Find median for the above data. Also find median graphically.

c) Find the missing frequency in the following distribution given that arithmetic mean is 96

weekly Expenditure	No. of families
50 - 70	20
70 - 90	60
90 - 110	70
110 - 130	-
130 - 150	10

05

OR

Q.1 a) Give merits and demerits of mode.

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b) The data given below is age distribution of school teachers.

Age in years	No. of teachers
22 - 26	5
26 - 30	8
30 - 34	14
34 - 38	16
38 - 42	10
42 - 46	6

Find Q1 and Q3. also find coefficient of quartile deviation.

06

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c) Following data gives salaries of government employees in a certain department. (in '000)

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121	133	123	125	129
125	138	126	126	134
128	142	128	130	136
140	129	140	138	141
132	125	141	136	143

Prepare frequency distribution for the above data taking class - intervals as 120-125, 125-130, Also plot frequency Polygon.

Q.2 a) Prices of a certain commodity for 6 years in two cities are given below

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Price in A :	20	12	15	16	18	22
Price in B :	10	30	12	18	15	25

which city shows more variability?

b) Define weighted average. What are its applications. Following data gives observations and their weightages in the data.

x_i :	150	152	170	185	162	190
w_i :	3	4	6	8	3	1

Find weighted average.

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c) Calculate correlation coefficient for the following data

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$$\Sigma (x - \bar{x})(y - \bar{y}) = 2940$$

$$\Sigma (x - \bar{x})^2 = 10080$$

$$\Sigma (y - \bar{y})^2 = 2520$$

$$n = 30$$

OR

Q.2 a) Following data gives marks of 25 students in Mathematics and Physics.

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x : Marks in Mathematics

y : marks in Physics

Then (x, y) values are

(11, 14),	(24, 20)	(25, 23)	(18, 20)	(25, 17)
(14, 16)	(21, 12)	(26, 14)	(17, 24)	(17, 18)
(20, 25)	(12, 14)	(15, 16)	(25, 12)	(18, 20)
(21, 20)	(13, 15)	(15, 25)	(28, 22)	(22, 23)
(15, 16)	(23, 26)	(15, 24)	(23, 15)	(25, 28)

Prepare bivariate frequency distribution taking class-intervals as 10-14, 14-18, 18-22, ... for both the variables.

Write marginal distribution of X.

Write conditional distribution of y when $x < 22$.

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b) Find geometric means for the following data 04

X_i : 426 430 448 452 531 600

c) Given the following information regarding profits of some companies calculate variance and standard deviation 05

profit (in '000 Rs.)	No. of companies
10 - 14	4
14 - 18	6
18 - 22	10
22 - 26	7
26 - 30	5

Q.3 a) Define multiplication theorem of probability. 05

A Committee of 4 is to be formed from 3 engineers, 6 supervisors and 4 managers. Find the probability that the committee contains

- i) 2 engineers and 2 supervisors
- ii) No supervisors.

b) Find equation of regression lines of Y on X and X on Y for the following data 06

X :	4	6	8	10	15	16	20
y :	12	10	4	8	7	12	14

c) Two groups contains 30 and 50 observations respectively. The arithmetic mean and standard deviation of the first group are 15 and 3 respectively. The combined mean and standard deviation at 80 observations taken together are 12 and $\sqrt{12}$ respectively. Find mean and standard deviation of the 2nd group. 04

OR

Q.3 a) A box contains 4 black, 3 white and 5 blue balls. 5 balls are selected randomly from the box. Find the probability that

- i) All the 4 balls are blue
- ii) At least 2 blue balls are selected
- iii) No black ball is selected

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b) Given the following data, find regression equation of y on x.

$$n = 12, \Sigma x = 120, \Sigma y = 180$$

$$\Sigma (x - \bar{x})(y - \bar{y}) = 134.4$$

$$\Sigma (x - \bar{x})^2 = 96$$

Estimate y when x = 12

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c) Given the following 2 regression lines, find \bar{x} , \bar{y} & r

$$4y - x - 700 = 0$$

$$9y - 25x + 5250 = 0$$

04

Q.4 a) Find $\frac{dy}{dx}$ of the following -

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i) $y = (3x^5 + 8)(e^x + 2)$

ii) $y = 5\sqrt{x} + 7x^{-4} + 4 \log x$

iii) $y = 6x^5 + 7x^7 + 4 \log x - 6\sqrt{x}$

b) Below are given demand curve and supply curve X : price, y : quantity.

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Find equilibrium price and quantity.

i) Demand Curve : $3x + 5y = 15$

Supply curve : $2x - 4y = 18$

ii) Demand curve : $2x + y = 12$

supply curve : $x - y = 100$

c) A panel of 2 judges ranked 8 participants in a beauty contest as follows-

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Participants	Rank I	Rank II
A	1	6
B	5	5
C	4	1
D	3	7
E	2	4
F	7	3
G	8	8
H	6	2

Find rank correlation coefficient

OR

Q.4 a) Fill in the blanks

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i) The median of 10, 15, 7, 9, is _____

ii) _____ is used to find average percentage.

iii) If $b_{yx} = -0.8$ and $b_{xy} = -0.4$, then $r =$ _____

iv) If A and B are, independent events, then $P(A \cap B) =$ _____

v) 4 persona can be arranged for a photograph in _____ ways.

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b) Find $\frac{dy}{dx}$ - 06

i) $y = x^3 \log x - 10x$

ii) $y = (2x + 4) \log x$

iii) $y = (x + 1) (2x + 2) (3x + 3)$

c) 2 cards are drawn from a pack of 52 cards. Find the probability that- 04

i) both the cards are ace

ii) One card is queen and the other is king

iii) both the cards are black
