

Pune Vidyarthi Griha's
College of Science and Technology
FYBMS

Business Statistics

Q.P. CODE: UBMSFSI.3

(Time: 2½ hours)

N.B :-

Total Marks 75

Date: 03/11/2023

1. All questions are compulsory.
2. Make suitable assumptions wherever necessary and state the assumptions made.
3. Answers to the same question must be written together.
4. Numbers to the right indicate marks.
5. Draw neat labeled diagrams wherever necessary.
6. Use of Non-programmable calculators is allowed

Q.1 (a) Fill in the blanks with the correct alternative (any eight)

(8)

1. When the investigator collects the data by himself, that data is called as _____
 - a) qualitative data
 - b) Primary data
 - c) Secondary data
 - d) none of these
2. Which of the following is a measure of dispersion _____
 - a) mean
 - b) Mode
 - c) Median
 - d) Mean deviation
3. The difference between lower and upper limit of a class interval is _____
 - a) class mark
 - b) length of class interval
 - c) class limit
 - d) midpoint of class
4. The histogram can be used to locate graphically the value of _____
 - a) Mean
 - b) Median
 - c) Mode
 - d) none of these
5. _____ variations occur due to weather or customs.
 - a) Cyclical
 - b) Irregular
 - c) Seasonal
 - d) none of these
6. For any probability mass functions, sum of all the probabilities is equal to.....
 - a) -1
 - b) 0
 - c) 1

- d) 2
7. The method used to derive regression constants of a regression equation is known as _____
- Product moment
 - Least square
 - Moving average
 - none of these
8. There are _____ components in time series.
- 3
 - 4
 - 5
 - None of these
9. Least square method is used to compute _____
- Nonlinear trend
 - Linear trend
 - Seasonal trend
 - None of these
10. For a statistical experiment every possible outcome is called.....
- Sample
 - Sample point
 - Sample space
 - Event

Q.1 (b) State whether the following are True or false (any seven) (7)

- Quartiles are measures of central tendency.
- The suitable measure of dispersion to indicate extreme variations in the data is range.
- Variance is a square of standard deviation.
- Sample space is not an event.
- Mean deviation is a relative measure of dispersion
- Pie diagram is represented by circles.
- With respect to index number, the year for which comparisons are made or desired is called base year.
- Standard deviation is denoted by r .
- Variance is always nonnegative.
- There are four components of time series

Q.2 (a) Find mean and median for the following data (8)

Class interval	10-30	30-50	50-70	70-90	90-110	110-130
Frequency	4	10	14	12	8	6

Q.2 (b) Calculate the standard deviation for the following data giving the advertising expenditure of 50 companies. (7)

Exp.in 1000	2	3	4	5	6	7
Number of Companies	3	5	15	12	8	7

OR

Q.2 (p) Calculate Modal marks. (8)

Marks	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Number of students	1	10	20	8	6	3	1

Q.2 (q) Calculate Q_3 for the following data giving the fees of 52 play groups. (7)

Fees in RS.	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000
Number of groups	4	6	12	15	8	7

Q.3 (a) Calculate Karl Pearson co-efficient of Correlation from the data given below giving the number of officers on duty and the time customers spend in waiting to see the officer in a bank. (8)

Number of officers	3	5	4	6	4	2
Waiting time in minutes	12	6	6	4	14	18

Q.3 (b) Find mean and variance of the following distribution.

x_i	1	2	3	4	5	6
p_i	$1/6$	$1/6$	$1/6$	$1/6$	$1/6$	$1/6$

OR

Q.3 (p) Find the regression equation of yield on fertilizer (i.e. $y = ax + b$) from the following data. (8M)

Fertilizer(x)	0	2	4	6	8	10
Yield (y)	110	113	118	119	120	118

Q.3 (q) Find Spearman's rank Correlation coefficient of for the following data given the ranks:-
(7)

R_1	1	2	3	4	5	6	7	8
R_2	5	4	2	1	7	8	6	3

Q.4 (a) For the following data calculate (i) Laspeyre's Index no (ii) Paasche's index no (iii) Fisher's index no
(8)

Commodity	Base year		Current year	
	Price	Quantity	Price	Quantity
A	12	50	20	120
B	10	100	12	70
C	14	60	15	70
D	16	30	18	50
E	15	40	18	40

Q.4 (b) A card is drawn at random from a well shuffled pack of 52 cards. Events A and B are defined as follows.

A is the event that the card is spade and B is the event that card is a king. Find $P(A \cup B)$.

OR

Q.4 (p) Fit a straight line trend for the following data Estimate the trend values for the year 2002
(8)

Year	2001	2002	2003	2004	2005	2006	2007
Production	93	98	95	102	107	100	110

Q.4 (q) For the following data calculate index number using weighted average of relative method.

Commodity	Unit	Price		Quantity consumed in 1990
		1990	1995	
Rice	Quintal	5	7	16
Wheat	Quintal	8	10	5
Pulses	Quintal	3	5	10
Sugar	Quintal	10	15	5

Q.5 (a) Two dice are rolled. X denotes the sum of the numbers appearing on the uppermost faces. Find (i) $P(X > 5)$ (ii) $P(3 < X < 7)$ (iii) $P(X \leq 3)$ (iv) $E(X)$ (v) $V(X)$ (8)

Q.5 (b) Given the following pay off table, decide the best decision using the criterion Maximin (ii) Maximax (iii) Laplace (iv) Minimin (v) Minimax regret (7)

Course of Action	States of nature		
	S_1	S_2	S_3
A_1	35	100	38
A_2	58	95	105
A_3	45	30	91

OR

Q.5 (p) Write short notes on any three out of 5:- (15)

1. Write a note on measures of central tendency.
2. Write a short note on Skewness and Kurtosis.
3. Write a short note on Probability.
4. Give the method for plotting frequency curve
5. Write a short note on Components of Time series.
