ARYAN COLLEGE
5 YEARS SCANNER BBA-II BUSINESS STATISTICS

Unit-I- Index number,Times Series,Business Forecasting

1. Write explanatory notes on the following: **(2016 – S)**
   a) Time Reversal Test
   b) Splicing of Index Numbers
   c) Base Shifting
   d) Price Relatives
   e) Chain Base Index Numbers
2. Compute the trend value by the method of least squares from the following data: **(2016 – S)**

Year	No. of Sheeps (in lakh)
2006	56
2007	55
2008	51
2009	47
2010	42
2011	38
2012	35
2013	32

   Also find the number of Sheeps for the year 2014.

3. What do you understand by 'Forecasting'? Explain the various methods used for forecasting in brief. **(2016 – S)**
4. Construct Fisher's ideal. Index number from the following data and show that it satisfies the Time Reversal Test and Factor Reversal Test. **(2016)**

Item	**2011**		**2012**	
	Quantity	**Total Expenditure**	**Price**	**Total Expenditure**
A	8	16	4	24
B	10	50	6	30
C	14	56	5	50
D	19	38	2	26

5. Following data relate to production of a factory in ('000) tonnes: **(2016)**

Year	**Production(in thousands)**
2006	77
2007	88
2008	94
2009	85
2010	91
2011	98
2012	90

   (a) Fit a straight line trend by method to least square. (b)What is monthly Increase in production? (c) Convert your annual trend equation into a monthly trend equation.
6. Short Notes: **(2016)**
   (a) Base shifting (b) Splicing of index number (c) Theories of business forecasting (d) Objects of business forecasting.

7. Construct the consumer price index number for 2012 from the following data by using: (a) Aggregate Expenditure Method (b) Family budget Method **(2015)**

Articles	**Qty Consumed in 2011**	**Unit**	**Price (2011)Rs.**	**Price (2012)Rs.**
Wheat	5 Qtls.	Per Qtl.	100	125
Rice	5 Qtls.	Per Qtl.	200	250
Gram	1 Qtls.	Per Qtl.	80	100
Arhar	3 Qtls.	Per Qtl.	120	180
Ghee	5Kg.	Per Kg.	8	10
Sugar	80 Kg	Per Kg.	2	3

8. You are given the following data. Compute the Trend Values by Least Square Method.Also find out the profits for the year 2014. **(2015)**

Financial Yr Ending	**Profit(In Lac of Rs.)**

31st March 2006	32
31st March 2007	35
31st March 2008	38
31st March 2009	42
31st March 2010	47
31st March 2011	51
31st March 2012	55
31st March 2013	56

9. What is meant by Business Forecasting? Explain the various methods of forecasting. **(2015)**
10. Prepare fixed base indices(Chain Based Indices chained to 2000) from the chain base index numbers given below. **(2014)**

Year	**Price**
2001	120
2002	104
2003	108
2004	154
2005	164
2006	168

11. What is a time series? What are its main components? Explain the importance of time series analysis. **(2014)**
12. What is business forecasting? Explain those statistical methods that help in business forecasting. **(2014)**
13. From the data given below ,Calculate weighted index number by: **(2013)**
    (a) Aggregative Expenditure method (b) Average of price relative method**.**

Articles	**Price in Base Yr**	**Price in Current Yr**	**Expenditure in Current Yr with Base Yr**
A	20	25	50
B	40	60	240
C	50	70	420
D	30	45	200

14. The following table shows the annual sales of a Company in Lakh Rupees, along with their calculated trend values: **(2013)**

Years	**Actual sales**	**Trend Values**
2003	170	228
2004	231	239
2005	261	251
2006	267	263
2007	278	275
2008	302	287
2009	299	299
2010	298	311
2011	340	323
2012	364	334

Compute the short term fluctuations based on Additive and Multiplicative model.

15. What is business forecasting? What are the assumptions on which business forecast are made? **(2013)**

Unit-II- Theory of Probability

1. Explain and illustrate the following theories of probability: **(2016 – S)**
   a) Addition theorem
   b) Multiplication theorem
   c) Mathematical expression
2. **(2016 – S)**
   a) The dice are tossed, what is the probability that the sum shown will be 07 or 11?
   b) A bag contains 4 white and 6 red balls. Two draws of 3 balls are made.

      Find the probability that first draw will give all the three white balls and the second will give all the three red balls, if the balls and the second will give all the three red balls, if the balls are replaced before the draw.
   c) *A* speaks the truth in 80% of cases and *B* in 90% of the cases. In what percentage of cases are they likely to contradict each other in stating the same fact?
3. **(2016)**

(a) A doctor is to visit a patient once in a month of November. Find the probability that he visit on a date which is a multiple of 6 or 5.

(b) There are 30 students in MCom Final and 50 students in MCom Previous in an university. 3 representative of commerce association are to be selected one by one. Find the probability that they are alternatively of different classes.

(c) A bag contains 5 white balls and 3 red balls. Second bag contains 3 white and 4 red balls and the third bag contains 2 white and 8 red balls. 1 red ball was drawn. What is the probability that it was drawn from the third bag.

4. What do you understand by the term probability? State the addition and multiplication theorems of probability giving suitable examples. **(2016)**
5. Explain and illustrate the following: **(2015)**
(a) Addition Theorem of Probability (b) Multiplication Theorem of Probability (c) Mathematical Expectation
6. **(2015)**
(a) The probability of a cricket team winning match at Kanpur is 2/5 and loosing match at Delhi is 1/7. What is the probability of the team winning at least one match.
(b) Two dice are thrown 3 times. What is the probability that total of the pair is 10 for the first throw, 11 in 2nd throw and 12 in the 3rd throw?
(c) What is the probability of having 53 Mondays in a leap year
7. **(2014)**
(a) The probability of the profits of a company are as follows:

Profit(Rs.)	**Probability**
10,000	0.3
20,000	0.2
25,000	0.4
40,000	0.1

What will be the mathematical expectation of the profit of the company?

(b) Define probability and explain the Addition Theorem of probability giving suitable examples
8. **(2014)**
i) Explain: (a) Conditional Probability (b) Mutually Exclusive Events
(ii) In a factory manufacturing fountain pens, Machine A,B & C manufacture 30%,30% & 40% of the total production of fountain pens respectively.Of their output 4%,5% & 10% of the fountain pens are found to be defective.If one fountain pen is selected at random,and it is found to be defective find the probability that it is manufactured by Machine C using Baye's Theorem Method.
9. **(2013)**
(a) What is the probability of getting a total of 2 or 8 or 12 on throwing a pair of dice?
(b) If two dice are thrown, what is the probability that total is obtained at least 7 from the pair?
10. Explain the difference: **(2013)**
(a) Simple and Compound Events (b) Independent and Dependent Events (c) Mutual Exclusive and Independent Events

Unit-III- Probability Distribution & Sampling Distribution

1. **(2016 – S)**
a) The number of defects per unit in a sample of 330 units of manufactured product was found as follows:

No. of Defects	No. of Units
0	214
1	92
2	20
3	03
4	01

Fit a Poisson Distribution to the data. (Given $e^{-0.439} = 0.6447$)

b) Narrate the salient features of Normal Probability Distribution.

2. Comment briefly on the term 'Parameter and Statistics used in a Sampling Theory'. What is meant by Sampling Distribution of a Statistics? Define Standard Error of a Statistic. **(2016 – S)**
3. **(2016)**
(a) Mean of a random sample of 100 units is 64cms, if the standard deviation of sample is 3 cms. Set probable limits of the mean height of the population at 95% and 99% level of confidence.
(b) In a multiple choice quiz, each question have 5 alternatives, out of them only one answer is correct. What is the probability of 6 correct answers out of 10 questions?
(c) The average number of customers, who appear at the counter of a certain bank per minute is 2. Find the probability that during a given minute, 3 or more customers will appear. (Given $e^{-2} = 0.1353$).
4. Short notes: **(2016)**
(a) Random Sampling (b) Poisson Distribution (c) Features of normal distribution.
5. **(2015)**
(a) In a binomial distribution if the mean is 3 and variants is 2, find the remaining constants.

(b) A factory manufacturing refills for ball pen, find on an average one defective out of 25. Refills are packed in a packet of 100 using the Poisson distribution; calculate all the constants of the distribution.

6. Short notes: **(2015)**
   (a) Random Sampling (b) Law of inertia of large numbers (c) Null Hypothesis (d) Characteristics of normal distribution.
7. Describe: (a) Binomial Distribution (b) Poisson Distribution **(2014)**
8. List the chief properties of Normal Distribution. **(2014)**
9. The following table shows the distribution of 128 samples: **(2013)**

No.of Defective Items	**No.of Samples**
7	1
6	7
5	23
4	30
3	35
2	19
1	6
0	7

   Fit a binomial distribution to the above data, and find the expected frequencies, if the chance of the machine being defective is ½, Find also means and variance of the fitted distribution.
10. What are the assumptions of Poisson Distribution? Explain the distribution and state its mean and variance. Show that its mean and variance are identical. **(2013)**