



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2017/2018
DIGITAL SCHOOL OF VIRTUAL AND OPEN LEARNING
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF COMMERCE
BMS 200: BUSINESS STATISTICS

DATE: Tuesday, 19th December 2017

TIME: 11.00 a.m. - 1.00 p.m.

INSTRUCTIONS:

- Answer Question One (Compulsory) and any other Two Questions
- Show all your workings
- Statistical tables are provided

QUESTION ONE (COMPULSORY)(30 Marks)

- a) Differentiate between the following terms as used in statistics
- (i) Nominal and Ordinal data (2 Marks)
 - (ii) Parameter and Statistic (2 Marks)
 - (iii) Continuous variable and Discrete Variable (2 Marks)
- b) The daily wages of 1000 workers are normally distributed with mean wage of ksh.600 and a standard deviation of ksh.20. Estimate the number of workers whose weekly wages are:-
- i) Between 590 and 640 (3 Marks)
 - ii) Less than 540 (3 Marks)
- c) The following table shows the distribution of 105 families according to their expenditure per week. Number of families corresponding to the expenditures groups' sh. (10 – 20) and sh. (30 – 40) are missing from the table. The Median and Mode for the distribution are sh.25 and sh. 24 respectively.

Expenditure (in sh.)	No of families
0-10	14
10-20	?
20-30	27
30-40	?
40-50	15

Using the data calculate the missing frequencies and arithmetic mean

(10 Marks)

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- d) A courier service advertises that its average delivery time is less than six hours for local deliveries. A random sample of the amount of time this courier takes to deliver packages to an address across town produced the following times (rounded to the nearest hour).

7, 3, 4, 6, 10, 5, 6, 4, 3, 8

- Find the 95% confidence interval estimate of the mean delivery time. (4Marks)
- Outline **four** properties of a normal distribution (4 Marks)

QUESTION TWO (20 Marks)

- Differentiate between correlation analysis and Regression analysis (4 Marks)
- You are provided with the following relationship about rent expense and the level of income earned

Rent expense Sh'000'	Level of income Sh '000'
20	50
25	60
40	80
45	130
15	30

Required:

- Establish the regression equation using the least squares method (8 Marks)
 - Predict the value of dependent variable if Sh 140,000 of the independent variable was considered (2 Marks)
- |
- Determine the correlation co-efficient between the two variables (4 Marks)
 - Determine the co-efficient of determination and interpret it (2 Marks)

QUESTION THREE (20 MARKS)

- Outline the properties of a good estimator (4 Marks)
- The probability distribution of a random variable X is shown in the table below

X	1	2	3	4	5
P(X=x)	0.3	0.15	y	0.25	0.1

- Find the value of y (3 Marks)
 - Find E(X) (3 Marks)
- c) The Choco Company makes two types chocolate eggs. 40% of the total production is milk chocolate and the rest are plain chocolates. The eggs are mixed before being

put into identical foil wrappings and randomly placed in boxes, each containing 12 eggs.

- i) A box is chosen at random. Find the probability that it contains exactly 6 milk chocolate eggs. (5 Marks)
- ii) The manager takes a random sample of 10 boxes of eggs from the production line. Find the probability that at least two of these boxes contain exactly 6 milk chocolate eggs. (5Marks)

QUESTION FOUR (20 MARKS)

- a) You are provided with the following information regarding the Kenyan economy for the years 2014, 2015 and 2016

Commodity	Maize (Kg)	Maize (Sh.)	Rice(Kg)	Rice (Sh)	Cooking Oil (Litre)	Oil (Sh)	Onions (Kg)	Onions (Sh)
2014	50	40	85	120	150	220	90	80
2015	52	42	80	110	160	195	75	70
2016	51	45	82	115	170	230	85	65

Required: From the above information, compute Paasches' and Laspeyeres' price Indices. Use year 2014 as the base year (10 Marks)

- b) Outline the four scales in measurement (4 Marks)
- c) A survey of 30 adults found that the mean age of a person's primary vehicle is 6 years. Assuming the standard deviation of the population is 0.8 years; find the 95% and 99% confidence interval of the population mean. (6Marks)

Z-DISTRIBUTION TABLE
(AREA OF STANDARD NORMAL DISTRIBUTION)

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1369	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.0736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.264	.2673	.2703	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4990	.4990	.4990

STUDENT-T DISTRIBUTION

P/V	.10	.05	.025	.02	.05
1	3.078	6.314	12.706	31.812	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.49
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.592	2.797
25	1.316	1.708	2.060	2.585	2.287
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
40	1.303	1.684	2.021	2.423	2.704
60	1.296	1.671	2.000	2.390	2.660
120	1.289	1.658	1.980	2.358	2.617
	1.282	1.645	1.960	2.326	2.576

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CHI-SQUARE DISTRIBUTION

Degree of Freedom	.20	.10	.05	.02	.01	.001
1	1.642	2.706	3.841	5.412	6.635	10.827
2	3.29	4.605	5.991	7.824	9.210	13.815
3	4.642	6.251	7.815	9.837	11.345	16.268
4	4.989	7.779	9.488	11.668	13.277	18.465
5	7.289	9.236	11.070	13.388	15.086	20.517
6	8.558	10.645	12.592	15.033	16.812	22.457
7	9.083	12.017	14.067	16.622	18.475	24.322
8	11.030	13.362	15.507	18.168	20.090	26.125
9	12.242	14.648	16.919	19.679	21.666	27.877
10	13.442	15.987	17.307	21.161	23.209	29.588
11	14.631	17.275	19.675	22.618	24.725	31.264
12	15.812	18.549	21.026	24.054	26.217	32.909
13	16.985	19.812	22.362	25.472	27.688	34.528
14	18.151	21.064	23.685	26.873	29.141	36.123
15	19.311	22.307	24.996	28.259	30.578	37.697
16	20.465	23.054	26.296	29.633	32.000	39.252
17	21.615	24.769	27.587	30.995	33.409	40.790
18	22.760	25.989	28.869	32.346	34.805	42.312
19	23.900	27.204	30.144	33.687	36.191	43.820
20	25.038	28.412	31.410	35.020	37.566	45.315
21	26.171	29.615	32.671	36.343	38.932	46.797
22	27.301	30.813	33.924	37.659	40.289	48.268
23	28.429	32.007	35.172	38.968	41.638	49.728
24	29.553	33.196	36.415	40.270	42.980	51.179
25	30.675	34.382	37.652	41.566	44.314	52.620
26	31.795	35.563	38.885	42.856	45.642	54.052
27	32.912	36.741	40.113	44.140	46.963	55.476
28	34.027	37.916	41.337	45.419	48.278	56.893
29	35.139	39.087	42.557	46.693	49.588	58.302
30	36.250	40.256	43.773	47.962	50.892	59.703