MUEO

MOI UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR, ACADEMIC AFFAIRS, RESEARCH & EXTENSION

UNIVERSITY EXAMINATIONS

2013/2014 ACADEMIC YEAR

THIRD YEAR END OF SEMESTER I EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF BUSINESS MANAGEMENT

EXAM CODE:- **BBM 350**

COURSE TITLE:- **MANAGERIAL STATISTICS**

DATE:-3RD DECEMBER, 2014 **TIME:- 9.00A.M. – 12.00NOON.**

INSTRUCTION TO CANDIDATES

- SEE INSIDE.

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BBM 350 MANAGERIAL STATISTICS

Answer any four questions.

1. a) Why is sampling necessary? (5marks)

b) Identify and discuss any five types of sampling methods. (20 marks)

2. a) Examine the properties of a normal probability distribution. (10marks)

b) If the wages paid by a company are known to be normally distributed with a mean of Sh 64 per hour and a standard deviation of Sh 12. What is the probability that a randomly selected worker from this company will earn:

i. Less than Sh 70
ii. More than Sh 76
iii. Between Sh 60 and Sh 74 (5 marks)

3. a) Discuss the four desirable properties of good estimators. (8marks)

b) A company produces products that have a standard deviation in length of 1.4 cm. If a random sample of 100 products have a mean length of 80 cm, what is the 98% confidence interval for the true mean length of products produced by this company. (8marks)

c) A random sample of 25 patients are given treatment in Kericho. 60% are cured. Calculate the 95% confidence interval for the proportion of all patients who will be cured by this treatment. (9marks)

4. a) Easy coach bus company says that its coaches take 5 hours from Nairobi to Kericho. In September this year, a consumer group wanted to verify this assertion and therefore timed 30 journeys from Nairobi to Kericho. They found out that the mean time for 30 journeys were 5 hours and 10 minutes with a standard deviation of 20 minutes.

What report can a consumer group make at the 7% level of significance? (15marks)

b) A tea processing factory in Kericho specifies the mean weight of tea packets as 200g. A random sample of 20 packets has a mean weight of 195g with a standard deviation of 15g. Does this evidence suggest that the mean weight of tea is too low at the 95% level? (10marks)

5. A banking and finance student at Moi University wants to determine whether there is any relationship or association between the size of a loan and the organization giving it. The table below shows the data collected. Do this data give sufficient evidence to indicate at the 5% level that there is a relationship between the two variables.

Source of loan	Size of loan				
	Less than Shs 100,000	Sh 100,000 to 500,000	Over Sh 500,000	Total	
Sacco	30	55	40	125	
Micro-finance	23	29	3	55	
Bank	12	6	2	20	
Total	65	90	45	200	

(25 marks)

6. a) State and explain the central limit theorem. (5marks)

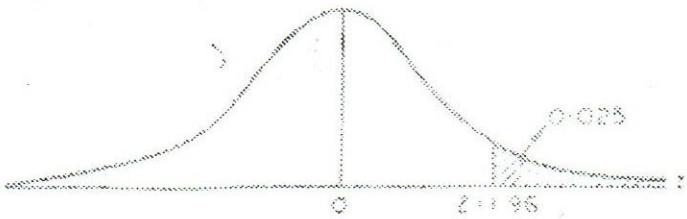
b) Company records show that the weekly distance travelled by their salesmen is approximately normally distributed with a mean of 800 Km and a standard deviation of 90 Km. The sales manager considers that the salesmen who travels less than 600Km in one week are performing poorly.

i. If the company employs 800 salesmen, how many would be expected to perform poorly in a particular week?

ii. The sales manager wishes to identify the number of Km travelled in one week above which only 1% of salesmen are expected. What weekly distance is this in Km? (10 marks each)

END

Table 1 Areas under the Normal Curve



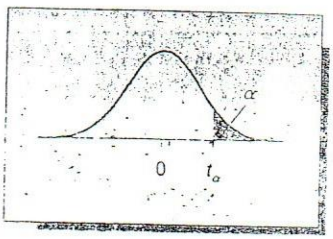
Example

$$z = \frac{x - \mu}{\sigma}$$

$P(Z > 1{\cdot}96) = 0{\cdot}0250$

z	00	01	02	03	04	05	06	07	08	09
0·0	·5000	·4960	·4920	·4880	·4840	·4801	·4761	·4721	·4681	·4641
0·1	·4602	·4562	·4522	·4483	·4443	·4404	·4364	·4325	·4286	·4247
0·2	·4207	·4168	·4129	·4090	·4052	·4013	·3974	·3936	·3897	·3859
0·3	·3821	·3783	·3745	·3707	·3669	·3632	·3594	·3557	·3520	·3483
0·4	·3446	·3409	·3372	·3336	·3300	·3264	·3228	·3192	·3156	·3121
0·5	·3085	·3050	·3015	·2981	·2946	·2912	·2877	·2843	·2810	·2776
0·6	·2743	·2709	·2676	·2643	·2611	·2578	·2546	·2514	·2483	·2451
0·7	·2420	·2389	·2358	·2327	·2296	·2266	·2236	·2206	·2177	·2148
0·8	·2119	·2090	·2061	·2033	·2005	·1977	·1949	·1922	·1894	·1867
0·9	·1841	·1814	·1788	·1762	·1736	·1711	·1685	·1660	·1635	·1611
1·0	·1587	·1562	·1539	·1515	·1492	·1469	·1446	·1423	·1401	·1379
1·1	·1357	·1335	·1314	·1292	·1271	·1251	·1230	·1210	·1190	·1170
1·2	·1151	·1131	·1112	·1093	·1075	·1056	·1038	·1020	·1003	·0985
1·3	·0968	·0951	·0934	·0918	·0901	·0885	·0869	·0853	·0838	·0823
1·4	·0808	·0793	·0778	·0764	·0749	·0735	·0721	·0708	·0694	·0681
1·5	·0668	·0655	·0643	·0630	·0618	·0606	·0594	·0582	·0571	·0559
1·6	·0548	·0537	·0526	·0516	·0505	·0495	·0485	·0475	·0465	·0455
1·7	·0446	·0436	·0427	·0418	·0409	·0401	·0392	·0384	·0375	·0367
1·8	·0359	·0351	·0344	·0336	·0329	·0322	·0314	·0307	·0301	·0294
1·9	·0287	·0281	·0274	·0268	·0262	·0256	·0250	·0244	·0239	·0233
2·0	·0228	·0222	·0217	·0212	·0207	·0202	·0197	·0192	·0188	·0183
2·1	·0179	·0174	·0170	·0166	·0162	·0158	·0154	·0150	·0146	·0143
2·2	·0139	·0136	·0132	·0129	·0125	·0122	·0119	·0116	·0113	·0110
2·3	·0107	·0104	·0102	·0099	·0096	·0094	·0091	·0089	·0087	·0084
2·4	·0082	·0080	·0078	·0075	·0073	·0071	·0069	·0068	·0066	·0064
2·5	·0062	·0060	·0059	·0057	·0055	·0054	·0052	·0051	·0049	·0048
2·6	·0047	·0045	·0044	·0043	·0041	·0040	·0039	·0038	·0037	·0036
2·7	·0035	·0034	·0033	·0032	·0031	·0030	·0029	·0028	·0027	·0026
2·8	·0026	·0025	·0024	·0023	·0023	·0022	·0021	·0021	·0020	·0019
2·9	·0019	·0018	·0018	·0017	·0016	·0016	·0015	·0015	·0014	·0014
3·0	·0013	·0013	·0013	·0012	·0012	·0011	·0011	·0011	·0010	·0010

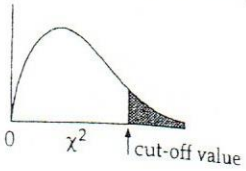
A t Table: Values of t_α



df	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$	$t_{.001}$	$t_{.0005}$
1	3.078	6.314	12.706	31.821	63.657	318.31	636.62
2	1.886	2.920	4.303	6.965	9.925	22.326	31.598
3	1.638	2.353	3.182	4.541	5.841	10.213	12.924
4	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.500	2.807	3.485	3.767
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	1.296	1.671	2.000	2.390	2.660	3.232	3.460
120	1.289	1.658	1.980	2.358	2.617	3.160	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.090	3.291

Table IV

The χ^2 distribution.



Degrees of freedom	Level of significance	
	5%	1%
$\nu = 1$	3.841	6.635
2	5.991	9.210
3	7.815	11.345
4	9.488	13.277
5	11.070	15.086
6	12.592	16.812
7	14.067	18.475
8	15.507	20.090
9	16.919	21.666
10	18.307	23.209
11	19.675	24.725
12	21.026	26.217
13	22.362	27.688
14	23.685	29.141
15	24.996	30.578
16	26.296	31.999
17	27.587	33.409
18	28.869	34.805
19	30.144	36.191
20	31.410	37.566
21	32.671	38.932
22	33.924	40.289
23	35.172	41.638
24	36.415	42.979
25	37.652	44.314