UGANDA MARTYRS UNIVERSITY

FACULTY OF BUSINESS ADMINISTRATION AND MANAGEMENT

UNIVERSITY EXAMINATION

FINAL EXAMINATION FOR BUSINESS ADMINISTRATION AND MANAGEMENT

YEAR ONE (LUBAGA, EVENING)

BUSINESS STATISTICS
2018/2019

DATE: 7/08/2019
TIME: 9:30am - 12:30pm
DURATION: 3 HOURS

Instructions:

*i. Attempt question any **FIVE** questions (Each question carries equal marks)*

*ii. Carefully read through **ALL** questions before attempting*

iii. Do not write anything on the question paper

iii. Show all workings and they have to be clear and tidy. Untidy work shall penalized

iv. No names should be written anywhere on the examination book.

*v. Ensure your that your **REG** number is indicated on all pages of the examination answer booklet.*

vi. Any type of examination Malpractice will lead to automatic disqualification

QUESTION ONE

a). Define Business Statistics **(Use relevant examples where necessary)** **[3 marks]**

b). State and explain the Branches of Business Statistics **(Use relevant examples where necessary)** **[5 marks]**

c). State the areas of application of Business Statistics **(Use relevant examples where necessary)** **[6 marks]**

d). State the Importance of Business Statistics **(Use relevant examples where necessary) [6 marks]**

QUESTION TWO

The following is a random sample of the number of tuberculosis infected people in 31 districts in Uganda.

47	95	54	33	64	4	8	57
8	90	3	49	4	44	79	80
68	7	15	21	52	6	78	109
29	80	16	50	9	48	40	

(a). Determine the:-

i. Mean ii) Median iii) Mode iv) Variance vi) Standard deviation vii) MAD viii) Quartile deviation **[2 marks each]**

(b). Plot a Cummulative Frequency Curve **[2 marks]**

(c). Plot a Histogram and estimate the modal class **[2 marks]**

(d). Comment on your answers **[2 marks]**

QUESTION THREE

a). Define the following concepts giving appropriate examples **[2 marks each]**

i). Conditional Probability
ii). Classical Probability
iii). Mutually Exclusive Events
iv). Independent Events
v). Binomial Distribution

b). If A and B are mutually exclusive events, P(A) = 0.46 and P(B) = 0.17, **[2 marks each]**

Required to find;

i). P(A U B)

ii). P(A'U B')

iii). P(A')

iv). P(A'n B')

v). P(An B)'

QUESTION FOUR

A product is tested in batches of 25 as it comes off a production line. It is estimated that 0.08 of the products are defective.

a). Required is to determine the probability that in a batch;

i). None is defective **[2 marks]**

ii). Exactly three are defective **[2 marks]**

iii). At most three are defective **[3 marks]**

iv). At least 20 are not defective **[3 marks]**

b). The income business firms in Masaka follow a normal distribution with a mean of 150.3 Million and standard deviation of 5 Million. **[2 marks each]**

Find the probability that a business picked at random from Masaka has income;

(i). Less than 147 Million (ii). More than 160 Million (iii). Between 150 and 158 Million

c). State the characteristics of a normal curve **[2 marks]**

d). State the importance of the normal distribution **[2 marks]**

QUESTION FIVE

A firm is working independently on two projects. There is a 0.7 chance of finishing project on A on time while that of finishing project B on time is 0.6.

(a). Required is to find the probability that: **[1 mark each]**

i). Both projects will be finished on time

ii). None of the projects will be finished on time

iii). Exactly one project will be finished on time

iv). At least one project will be finished on time

v). At most one project will be finished on time

(b). A company manufactures and sells a single product in shillings. Estimated sales, costs and selling prices for the coming year are as follows.

Sales Units	Probability	Selling Price Per Unit	Probability
20,000	0.4	900	0.3
25,000	0.4	850	0.6
30,000	0.2	800	0.1
Variable Cost Per Unit	Probability	Fixed Costs for the Year	Probability
600	0.1	1,200,000	0.4
650	0.2	1,500,000	0.6
680	0.5		
700	0.2		

Determine

i. The expected annual profit **[10 marks]**

ii. The worst possible scenario for the coming year **[05 marks]**

QUESTION SIX

(a). You are a marketing consultant employed by MTN to determine the size of their market size and elicit views and opinions on their service of mobile money.

i). State the steps you would use to compile the information **[5 marks]**

ii). State the different methods for data collection **[3 marks]**

(b). Using appropriate examples write short notes on the following

i). Simple Random Sampling **[3 marks]**

ii). Stratified Random Sampling **[3 marks]**

iii). Systematic Random Sampling **[3 marks]**

iv). Multi stage Random Sampling **[3 marks]**

QUESTION SEVEN

(a). Differiante between Correlation and Regression **[3 marks]**

(b). Define and list co-efficients of determination **[4 marks]**

(c). Below is a table with marks awarded by two judges from contestants after a fashion show runway **[13 marks]**

Judge A (X)	5.8	5.5	5.9	4.9	5.9	5.6	5.0
Judge B (Y)	5.5	5.4	5.8	6.3	5.7	7.7	8.9

(i). Plot a Scatter Diagram

(ii). Using Karl Pearson compute the Correlation Co-efficient

(iii). Comment on your result

Standard Normal Probabilities

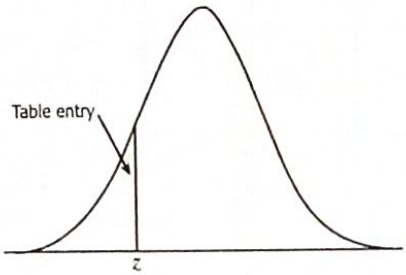

Table entry for z is the area under the standard normal curve to the left of z.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
−3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
−2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
−2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
−2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
−2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
−2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
−2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
−2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
−2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
−2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
−2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
−1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
−1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
−1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
−1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
−1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
−1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
−1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
−1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
−1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
−1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
−0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
−0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
−0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
−0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
−0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
−0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
−0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
−0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
−0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
−0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

Standard Normal Probabilities

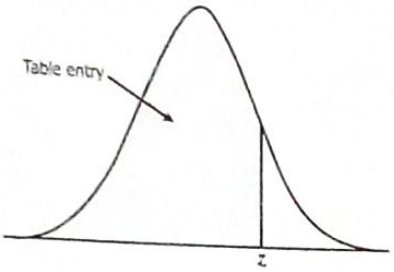

Table entry for z is the area under the standard normal curve to the left of z.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

STATISTICAL FORMULAE

$$Estimated\ \ mean = \frac{\sum f * x}{\sum f}.$$

$$Estimated\,median = L_M + \frac{\frac{N}{2} - F_B}{f_M} * w$$

$$Estimated\ \mathrm{mod}\,e = L_M + \frac{f_M - f_B}{(f_M - f_B) + (f_M - f_A)} * w$$

$$Sample\ \mathrm{var}\,iance = s^2 = \frac{\sum f(x-\mu)^2}{N-1}$$

$$Q_1 = L_{Q_1} + \frac{\frac{N}{4} - F_B}{f_{Q_1}} * w$$

$$Q_3 = L_{Q_3} + \frac{\frac{3N}{4} - F_B}{f_{Q_3}} * w$$

$$Quartile\ Deviation = \frac{Q_3 - Q_1}{2}$$

$$Pearson\ Correlation\ (r) = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left[n\sum x^2 - \left(\sum x\right)^2\right]\left[n\sum y^2 - \left(\sum y\right)^2\right]}}$$

END