PENINSULA COLLEGE GEORGETOWN DK266-03(P)

FINAL EXAMINATION

Semester	:	**JANUARY 2026 SEMESTER**
Programme Name	:	**DIPLOMA OF ACCOUNTANCY** **MICRO-AWARD IN BA (HONS) ACCOUNTING AND FINANCE (ACCOUNTING)**
Course Code & Name	:	**DBMT3033 QUANTITATIVE METHODS** **DBMT3033 MICRO-CREDENTIAL IN QUANTITATIVE METHODS**
Duration	:	**3 HOURS**

INSTRUCTIONS TO CANDIDATES:

1. Please read the instructions given in the question paper **CAREFULLY.**
2. The question paper consists of **FOUR (4)** questions.
3. Answer **ALL** questions in the question paper.
4. Answers to the questions are to be written into the examination booklet.
5. Electronic dictionaries, lecture notes, files or any unauthorised materials except writing equipment are strictly prohibited.

This question paper must be submitted along with all used and/or unused rough papers and/ or graph papers (if any). Candidates are **NOT ALLOWED** to take any examination paper(s) used or unused out of the examination hall.

WARNING:

The Examination Board of Peninsula College Georgetown regards cheating as a very serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from Peninsula College Georgetown.

(*This booklet contains 8 printed pages including this page*)

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ALLOWED TO DO SO

Answer **ALL** the questions on the separate sheet provided. **[100 marks]**

1. a) For each statement below, state the null hypothesis H_0) and the alternative hypothesis (H_1).

   i) A researcher believes that students using an AI tutoring app score differently on their finals than the national average of 72%. (2 marks)

   ii) A pizza chain guarantees that its mean delivery time is at most 30 minutes. A consumer watchdog group claims the mean time is longer. (2 marks)

   iii) A nutritionist claims that the average daily calorie intake of adults is less than 2,500 calories. (2 marks)

   iv) A university administrator claims that the average GPA of diploma of Accountancy students is not equal to 3.0. (2 marks)

   b) A food delivery company claims that the average delivery time for customer orders is less than 40 minutes. The standard deviation of the delivery time is known to be 8 minutes. A random sample of 64 orders shows that the average delivery time is 42 minutes.

   Test whether there is sufficient evidence to reject the company's claim at a significance level of $\alpha = 0.05$. (9 marks)

   c) A marketing consultant claims that more than 60% of small retail businesses use social media to promote their products. A random sample of 150 small retail businesses shows that 54.7% businesses use social media for promotion.

   Test the consultant's claim at a significance level of $\alpha = 0.01$. (8 marks)

   Total: [25 marks]

2. a) A study was conducted to investigate the relationship between the number of hours spent on social media (X) and the number of hours spent sleeping (Y) for five students.

Student	A	B	C	D	E
Social media hours, X	1	3	4	6	8
Sleep hours, Y	8	7	5	4	3

   Sketch a scatter plot for the above data and describe the relationship of the two variables. (9 marks)

2. b) A human resource consultant is comparing the relationship between work experience (X) and job performance (Y) in two different industries: Retail and Software Engineering. The following summary data was collected from 10 employees in each sector.

Sector	ΣX	ΣY	ΣXY	ΣX²	ΣY²	n
Retail	20	150	640	100	4600	5
Software Engineering	25	200	1020	135	8500	5

i) Calculate the Pearson Correlation Coefficient (r) for both the Retail and Software Engineering sectors. (10 marks)

ii) Calculate the Coefficient of Determination (r^2) for both the Retail and Software Engineering sectors. (4 marks)

iii) Based on your calculation of r^2 in Q2(b)(ii), briefly explain which sector's job performance is more strongly explained by work experience. (2 marks)

Total: [25 marks]

3. a) A marketing manager wants to determine the relationship between Advertising Expenditure and Monthly Sales Revenue. Data from the past 6 months was collected and summarized as follows.

Advertising Expenditure (X) in RM '000	2	3	5	6	8	10
Monthly Sales Revenue (Y) in RM '000	10	15	20	22	30	35

i) Construct the regression equation $y' = a + bx$ for the above data. (15 marks)

ii) Predict the monthly sales revenue if the company spends RM 7,000 and RM 11,000 on advertising Expenditure (4 marks)

b. A logistics company is analysing the relationship between distance travelled (X) and fuel consumption (Y) for two different types of delivery vehicles. The following data were summarized from their regression models.

Vehicle Type	Regression Sum of Squares (SSR)	Sum of Squares Error (SSE)
Light Van	4,200	800
Heavy Truck	7,500	2,500

i) Calculate the Total Sum of Squares (SST) for the Light Van and Heavy Truck. (4 marks)

3. b. ii) Based on your SST calculations in Q3(b)(i), briefly explain which vehicle type shows a larger total variation in fuel consumption values around the mean.
(2 marks)
Total: [25 marks]

4. a) A retail company recorded its quarterly sales (in RM'000) over the past six quarters as shown in the table below.

Quarter	Sales (RM'000)
Q1	120
Q2	135
Q3	150
Q4	165
Q5	180
Q6	195

i) Using the data above, calculate the 3-quarter moving averages for the time series. (8 marks)

ii) Based on the moving averages data obtained in Q4(a)(i), briefly explain the trend of the company's sales over the six quarters. (2 marks)

b) List **FIVE (5)** key elements of Six Sigma in quality improvement. (5 marks)

c) Many organizations adopt Total Quality Management (TQM) to improve efficiency, reduce errors, and enhance customer satisfaction.

Discuss **FIVE (5)** important themes of Total Quality Management (TQM) that organizations should implement to achieve continuous quality improvement.
(10 marks)
Total: [25 marks]

- END OF QUESTIONS -

FORMULAE LIST

SAMPLING DISTRIBUTION

$$\mu = \bar{X} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$\mu = \bar{X} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}$$

$$\pi = p \pm Z_{\alpha/2} \sqrt{\frac{p(1-p)}{n}}$$

HYPOTHESIS TESTING

$$z = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

CORRELATION

$$r = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{n(\Sigma x^2) - (\Sigma x)^2}\sqrt{n(\Sigma y^2) - (\Sigma y)^2}}$$

$$r = 1 - \frac{6\sum d^2}{n^3 - n}$$

REGRESSION

$$a = \frac{\sum Y}{n} - b\frac{\sum X}{n}$$

$$b = \frac{n(\sum XY) - (\sum X)(\sum Y)}{n(\sum X^2) - (\sum X)^2}$$

$$SST = \sum_{i=1}^{n} (y_i - \bar{y})^2$$

$$SST = SSR + SSE$$

TIME SERIES

$$F_{t+1} = \text{average of } n \text{ most recent observations}$$

$$= \frac{\text{latest demand} + \text{next latest} + \ldots + n\text{th latest}}{n}$$

$$= \frac{y_t + y_{t-1} + \ldots + y_{t-n+1}}{n}$$

$$b = \frac{\sum tY - (\sum Y)\left(\frac{\sum t}{n}\right)}{\sum t^2 - \frac{(\sum t)^2}{n}}$$

$$a = \frac{\sum Y}{n} - b\left(\frac{\sum t}{n}\right)$$

TABLE E The Standard Normal Distribution

Cumulative Standard Normal Distribution

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

For z values less than −3.49, use 0.0001.



TABLE E *(continued)*

Cumulative Standard Normal Distribution

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

For z values greater than 3.49, use 0.9999.

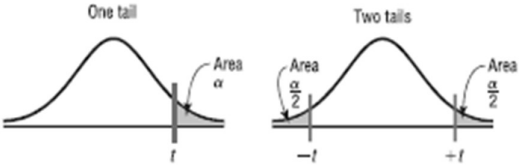


TABLE F The *t* Distribution

	Confidence intervals	80%	90%	95%	98%	99%
	One tail, α	0.10	0.05	0.025	0.01	0.005
d.f.	Two tails, α	0.20	0.10	0.05	0.02	0.01
1		3.078	6.314	12.706	31.821	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	3.499
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	2.492	2.797
25		1.316	1.708	2.060	2.485	2.787
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
32		1.309	1.694	2.037	2.449	2.738
34		1.307	1.691	2.032	2.441	2.728
36		1.306	1.688	2.028	2.434	2.719
38		1.304	1.686	2.024	2.429	2.712
40		1.303	1.684	2.021	2.423	2.704
45		1.301	1.679	2.014	2.412	2.690
50		1.299	1.676	2.009	2.403	2.678
55		1.297	1.673	2.004	2.396	2.668
60		1.296	1.671	2.000	2.390	2.660
65		1.295	1.669	1.997	2.385	2.654
70		1.294	1.667	1.994	2.381	2.648
75		1.293	1.665	1.992	2.377	2.643
80		1.292	1.664	1.990	2.374	2.639
90		1.291	1.662	1.987	2.368	2.632
100		1.290	1.660	1.984	2.364	2.626
500		1.283	1.648	1.965	2.334	2.586
1000		1.282	1.646	1.962	2.330	2.581
(z) ∞		1.282[a]	1.645[b]	1.960	2.326[c]	2.576[d]

[a] This value has been rounded to 1.28 in the textbook.
[b] This value has been rounded to 1.65 in the textbook.
[c] This value has been rounded to 2.33 in the textbook.
[d] This value has been rounded to 2.58 in the textbook.

Source: Adapted from W. H. Beyer, *Handbook of Tables for Probability and Statistics*, 2nd ed., CRC Press, Boca Raton, Fla., 1986. Reprinted with permission.



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