



Hong Kong Institute of
Accredited Accounting Technicians
香港財務會計協會

Accredited Accounting Technician Examination

Pilot Examination Paper

Paper 4 Business Economics and Financial Mathematics

Questions & Answers Booklet

The Suggested Answers given in this booklet are purposely made to give more details for educational purpose.

© Hong Kong Institute of Accredited Accounting Technicians Limited 2008

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, and/or otherwise, without the prior written permission of the copyright owner.

Published in June 2008



Hong Kong Institute of
Accredited Accounting Technicians
香港財務會計協會

Accredited Accounting Technician Examination

Pilot Examination Paper

Paper 4 Business Economics and Financial Mathematics

Time allowed – 3 hours

Section A: Multiple-choice Questions – Attempt all 15 Questions

Section B: Compulsory Questions – Attempt all 2 Questions

Section C: Optional Questions – Attempt any 2 out of 3 Questions

**DO NOT OPEN THIS QUESTION PAPER UNTIL
INSTRUCTED TO DO SO BY THE SUPERVISOR**

SECTION A (MULTIPLE-CHOICE QUESTIONS) (20 marks)

Answer **ALL** questions in this section. Choose the best answer for each question.
Marks will not be deducted for incorrect answers.

(Questions A1 to A10 carry 1 mark each. Total: 10 marks)

- A1.** The ticket to a concert is \$200. The price of a book is \$300. John decides to go for the concert and not to buy the book and saves \$100.
- A The opportunity cost of going for the concert is \$200.
 - B The opportunity cost of buying the book is \$300.
 - C The opportunity cost of going for the concert is \$100 savings.
 - D The opportunity cost of going for the concert is not to buy the book.
- A2.** Which of the following statements is **INCORRECT** for the law of diminishing returns?
- A The law is applicable to a situation when all inputs are variable.
 - B Variable inputs are added to some fixed inputs in a fixed time period.
 - C The additional output produced by an extra unit of variable input will diminish.
 - D The law of diminishing returns is able to explain short run average cost.
- A3.** Which of the following market structures **BEST DESCRIBES** the banking industry in the Hong Kong Special Administrative Region?
- A Perfect competition
 - B Monopolistic competition
 - C Oligopoly
 - D Monopoly
- A4.** Which of the following statements about market failure is **INCORRECT**?
- A Due to free-rider problems, public goods should be provided by the government rather than produced by the market.
 - B Market failure means the market does not exist.
 - C Government intervention in the securities industries is to correct market failure.
 - D Pollution taxes are possible remedies for market failure in environmental protection.
- A5.** Which of the following statements do you find **MOST RELEVANT** to describe a government macroeconomic policy?
- A A government aims to achieve even distribution of income in a free market economy.
 - B A government needs to invest in human capital formation to improve productivity.
 - C A government intervenes to avoid market failure.
 - D A government aims to achieve mild inflation, full employment and steady economic growth.

- A6.** Suppose all the banks offer the same interest rate to savings deposits accounts per annum. In order to maximise your return, you would put your savings in a bank which compounds interest:
- A yearly.
 - B semi-annually.
 - C quarterly.
 - D daily.
- A7.** Which of the following statements in a statistical survey is **VALID**?
- A Primary data is more important than secondary data.
 - B Inferential statistics is to describe data for the future.
 - C Systematic random sampling has a problem of bias if the data in the population has a repetitive structure.
 - D Simple random sampling is most useful as every item in the population has an unequal probability of being selected.
- A8.** A government has just released statistics for a city which has 3 million people with full time employment and there are 150,000 people registered as unemployed. What is the rate of unemployment from the information?
- A 5.26%
 - B 5.0%
 - C 4.76%
 - D 4.26%
- A9.** Which of the following descriptions is **NOT** a method of diagrammatic representation of data?
- A A pictogram is to use a symbol or picture to represent the value of a variable.
 - B A bar chart is the use of bars of unequal width to represent the value of a variable.
 - C A pie chart is to divide the sectors of a circle in proportion to the size of the data collected.
 - D A histogram is used to represent data collected in the form of a grouped frequency distribution.
- A10.** Which of the following statements is **INAPPROPRIATE** in the classification of data?
- A The data should be rounded before classification.
 - B The number of classes should be relatively few.
 - C The class intervals should be equal if possible.
 - D There should not be overlap in the class limits for continuous data.

(Questions A11 to A15 carry 2 marks each. Total: 10 marks)

- A11.** The toll for crossing a tunnel is increased from \$40 to \$45. The number of cars crossing the tunnel falls from 40,000 to 30,000 per day. Which of the following statements is **CORRECT**?
- A The price elasticity of demand is 2 and the increase in toll will increase the total revenue for the tunnel.
 - B The price elasticity of demand is 2.43 and the increase in toll will decrease the total revenue for the tunnel.
 - C The price elasticity of demand is 3 and the increase in toll will decrease the total revenue for the tunnel.
 - D The price elasticity of demand is 2.43 and the increase in toll will increase the total revenue for the tunnel.
- A12.** In a hypothetical economy, the marginal propensity to consume is 0.8. Suppose the government increases \$10 billion on public infrastructures, what would be the projected effects on the economy?
- A The national income will increase by \$8 billion and savings by \$2 billion.
 - B The national income will increase by \$10 billion.
 - C The national income will increase by \$18 billion.
 - D The national income will increase by \$50 billion.
- A13.** You are offered two plans to invest your \$200,000. Plan A offers you the perpetuity of \$10,000 a year. Plan B offers you the cash inflow \$17,000 a year for 20 years. You like to earn a rate of return of 5% per annum on your savings. Which plan would you choose to invest in?
- A Either plan A or B as they offer the same rate of return at 5% per annum.
 - B Plan A as it offers the perpetual cash inflow.
 - C Plan B as its fair market value is higher than plan A.
 - D Plan B as its cash inflow is higher than plan A.
- A14.** In a sample questionnaire survey on 200 people, the mean score of the respondents is 60 with a standard deviation of 10. If the confidence level is 95%, in what range of values does the population mean lie?
- A The population mean lies between 59.5 to 60.5.
 - B The population mean lies between 59.95 to 60.05.
 - C The population mean lies between 59.56 to 60.44.
 - D The population mean lies between 58.61 to 61.39.

- A15.** The following hypothetical table indicates the quantity and price of goods X and Y in the year 2006 and 2007.

Year	Goods X (Quantity in units)	Goods X (\$ per unit)	Goods Y (Quantity in units)	Goods Y (\$ per unit)
2006	10,000	10	5,000	6
2007	12,000	11	7,000	8

Calculate the Laspeyres index in year 2007 with 2006 as base year at 100.

- A 115.38
- B 116.05
- C 121.83
- D 122.72

(Total: 20 marks)

[END OF SECTION A]

SECTION B (COMPULSORY QUESTIONS) (30 marks)

Answer **ALL** questions in this section. Marks are indicated at the end of each question.

- B1.** (a) Define inflation and distinguish **FOUR** possible sources of inflation from one another in an economy. (5 marks)
- (b) Define unemployment and explain briefly **FOUR** possible causes of unemployment in an economy. (5 marks)
- (c) Explain briefly the remedies for structural unemployment undertaken by the Government of the Hong Kong Special Administrative Region? (5 marks)
- (Total: 15 marks)

B2. The following data were the returns from a share investment in the last five years.

8%, 9%, 10%, 11%, 14%

REQUIRED:

As an investment analyst,

- (a) Identify the median and comment on **ANY THREE** of its advantages and **ANY THREE** of its disadvantages as a statistical measure. (7 marks)
- (b) Calculate the mean and comment on **ANY FOUR** of its advantages and **ANY THREE** of its disadvantages as a statistical measure. (8 marks)
- (Total: 15 marks)

[END OF SECTION B]

SECTION C (OPTIONAL QUESTIONS) (50 marks)

Answer any **TWO** questions only in this section. Each question carries 25 marks.

- C1.** The following hypothetical table summarises the demand and supply conditions in the commercial rental properties market.

Rental (\$ per square foot)	Quantity demanded (square foot in million)	Quantity supplied (square foot in million)
60	10,000	5,000
70	9,000	6,500
80	8,000	8,000
90	7,000	9,500
100	6,000	11,000

REQUIRED:

- (a) Analyse the economic nature of demand for commercial rental properties, identify and explain the equilibrium in the commercial rental properties market. (7 marks)
- (b) Calculate the price elasticity of demand for commercial rental properties between the rental \$70 to \$80 and comment on the meaning of the calculated value. Explain ANY THREE factors that may influence the price elasticity of demand for commercial rental properties. (10 marks)
- (c) Evaluate the possible impact on the market if the government imposes a rental ceiling at \$70 per square foot. What are the major arguments against the imposition of a rental ceiling in a free market economy? (8 marks)

(Total: 25 marks)

- C2.** Your company is considering a capital expenditure to purchase a new machine at a cost of \$200,000. An engineering study was undertaken by consultants at a cost of \$20,000 and has proved the technical competence of the machine to increase output and quality. It is estimated that the machine would have a useful life of four years. The machine would be sold at a scrap value of \$30,000. It would generate annual profit of \$12,000, after deducting an annual depreciation of \$50,000 and absorption of \$15,000 fixed costs that will be incurred anyway. The company's required rate of return is 10%.

REQUIRED:

(Ignore the tax effect in your answer.)

As the company's financial analyst, you are required to

- (a) **State the assumptions on the timing of cash flows.** (3 marks)
- (b) **Explain briefly the principle of incremental cash flow and identify the relevant cash flows and sunk costs of the machine investment.** (7 marks)
- (c) **State the three possible scenarios of net present value from a project in relation to the project's required rate of return.** (3 marks)
- (d) **Calculate the net present value and decide on the purchase of the new machine.** (12 marks)

(Total: 25 marks)

- C3.** When attending an interview for the position of an accountant in a property investment company, the interviewer showed you some data and discussed with you property price variations in a city. He provided you with the following property prices in two localities, X and Y.

Locality X Property price (\$ per square foot)	Locality Y Property price (\$ per square foot)
4,000	3,800
4,300	4,400
4,700	4,800
5,300	5,200
6,000	5,800

REQUIRED:

- (a) Describe briefly the process of statistical analysis in a business context with reference to the above discussion of property price variations. (9 marks)
- (b) Explain briefly the principles of data construction for easy comprehension with reference to the above business discussion. (6 marks)
- (c) Calculate the standard deviation on property price with reference to the above table of data in localities X and Y. (4 marks)
- (d) Calculate the coefficient of variation of property price with reference to the above table of data in localities X and Y and explain its uses as a statistical measure. (6 marks)

(Total: 25 marks)

[END OF EXAMINATION PAPER]

APPENDIX

Present Value Factors

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Present Value Factors - Cumulative

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

[END OF APPENDIX]

Suggested Answers

Pilot Examination Paper

Paper 4

Business Economics and Financial Mathematics

SECTION A (MULTIPLE-CHOICE QUESTIONS) (20 marks)

(Questions A1 to A10 carry 1 mark each. Total: 10 marks)

- A1. D
- A2. A
- A3. C
- A4. B
- A5. D
- A6. D
- A7. C
- A8. C
- A9. B
- A10. A

(Questions A11 to A15 carry 2 marks each. Total: 10 marks)

- A11. B
- A12. D
- A13. C
- A14. D
- A15. A

(Total: 20 marks)

SECTION B (COMPULSORY QUESTIONS) (30 marks)

B1. (a) Inflation is the persistent increase in the general price level. **[1 mark]**

To distinguish the possible sources of inflation from one another,

- Demand-pull inflation is the increase in aggregate demand leading to a rise in general price level. **[1 mark]**
- Cost-push inflation is the shortage of factors of production leading to an increase in costs. **[1 mark]**
- Imported inflation is the depreciation of home currency leading to a rise in price of imports. **[1 mark]**
- Monetary inflation is the expansion of money supply leading to a rise in general price level. **[1 mark]**

(Other valid explanations are acceptable.)

(5 marks)

(b) Unemployment is the phenomenon when people who are willing and able to work cannot find jobs. **[1 mark]**

The possible causes of unemployment include:

- Structural unemployment as a result of the decline of particular industries in an economy. **[1 mark]**
- Cyclical unemployment as a result of the variations in business cycle. **[1 mark]**
- Frictional unemployment as a result of people leaving jobs and looking for new ones. **[1 mark]**
- Natural rate of unemployment as determined by the underlying structures in an economy. **[1 mark]**

(Other valid explanations are acceptable.)

(5 marks)

(c) The Hong Kong Special Administrative Region has changed from an industrial economy to a knowledge based economy. **[1 mark]**

To relieve structural unemployment, the Government should:

- increase the provision of tertiary education for the young. **[1 mark]**
- provide financial support for adults to enhance knowledge based skills. **[1 mark]**
- offer retraining programmes to the unskilled workers. **[1 mark]**
- promote the growth of service industries to create more job opportunities for the unemployed. **[1 mark]**

(Other valid remedies are acceptable.)

(5 marks)

(Total: 15 marks)

B2. (a) The median is 10%. **[1 mark]**

The advantages of median are:

- It is easy to understand. **[1 mark]**
- It is not affected by extreme data. **[1 mark]**
- It is an actual data in the distribution. **[1 mark]**

The disadvantages are:

- It may not be representative if there are only a few data. **[1 mark]**
- It may be a tedious job to arrange the data in order of size. **[1 mark]**
- It is unsuitable for use in mathematical statistics. **[1 mark]**

(Other valid explanations are acceptable.)

(7 marks)

(b) The mean is 10.4%. **[1 mark]**

The advantages of mean are:

- It is easy to understand. **[1 mark]**
- It is representative of the whole set of data. **[1 mark]**
- It can be used in more advanced mathematical statistics. **[1 mark]**
- It is easy to calculate when total value of items and number of items are known. **[1 mark]**

The disadvantages are:

- It may be influenced by extreme values. **[1 mark]**
- It may not be an actual data in the distribution. **[1 mark]**
- If the data is split into “clusters”, the arithmetic mean is not suitable. **[1 mark]**

(Other valid explanations are acceptable.)

(8 marks)

(Total: 15 marks)

SECTION C (OPTIONAL QUESTIONS) (50 marks)

- C1. (a)** The economic nature of demand explains:
- Commercial rental properties could be considered as land. **[1 mark]**
 - Being a factor of production, the demand is a derived one. **[1 mark]**
 - The properties are to conduct profit maximising activities. **[1 mark]**

The meaning of market equilibrium suggests:

- Equilibrium is a price equaling quantity demanded and supplied. **[1 mark]**
- Equilibrium has no tendency for changes in price and quantity. **[1 mark]**
- Equilibrium price is \$80 per square foot. **[1 mark]**
- Equilibrium quantity is 8,000 million square foot. **[1 mark]**

(7 marks)

- (b)** Price elasticity of demand
 $= (1,000 / 8,500) \times (\$75 / \$10)$
 $= 0.88$ **[2 marks]**

The value suggests:

The demand for commercial rental properties is fairly inelastic. **[1 mark]**
Quantity demanded is less responsive to changes in rental. **[1 mark]**

The factors influencing the price elasticity of demand may include:

- Few substitutes to commercial rental properties make it inelastic. **[2 marks]**
- Land is a necessary factor of production and its demand is inelastic. **[2 marks]**
- The proportion of rental in costs make the demand inelastic. **[2 marks]**

(Other valid factors are acceptable.)

(10 marks)

- (c)** The impact on the market may be:
- The rental ceiling becomes a form of maximum price control. **[1 mark]**
 - Quantity demanded exceeds quantity supplied at rental ceiling. **[1 mark]**
 - Shortage of 2,500 million sq. ft. rental properties develops. **[1 mark]**
 - Black market between landlords and tenants develop. **[1 mark]**
 - The actual rental paid is above the imposed ceiling. **[1 mark]**

The major arguments against the imposition includes:

- Free market economy relies on price to allocate resources. **[1 mark]**
- Maximum price control distorts the market mechanism. **[1 mark]**
- Quantity transacted is not dependent on price. **[1 mark]**

(8 marks)

(Total: 25 marks)

- C2. (a)** The assumptions on the timing of cash flows for the project are:
- Capital expenditure on the machine occurs in year 0. **[1 mark]**
 - Cash flows occurring during the year are assumed at year end. **[1 mark]**
 - Cash flows occurring at the start of the year are assumed at last year end. **[1 mark]**

(3 marks)

- (b)** The principle of incremental cash flow is:
- Explicit cash outflows and inflows arise as direct consequences of the project. **[2 marks]**
 - Cash flows include implicit opportunity costs as well, if any. **[1 mark]**
 - The machine cost is a relevant cash flow. **[1 mark]**
 - The engineering study is a sunk cost. **[1 mark]**
 - The scrap value of the machine is a relevant cash flow. **[1 mark]**
 - After adjustments for depreciation and fixed costs, annual profit becomes a relevant cash flow. **[1 mark]**

(7 marks)

- (c)** The net present value for a project may be:
- Positive which indicates a return above the required rate of return. **[1 mark]**
 - Zero which indicates a return equalling the required rate of return. **[1 mark]**
 - Negative which indicates a return below the required rate of return. **[1 mark]**

(3 marks)

- (d)** Net cash flow from operation:
= Annual profit + annual depreciation + fixed costs
= \$12,000 + \$50,000 + \$15,000
= \$77,000 **[2 marks]**

Year	Cash flow \$	Discount factor 10%	Present value \$	
0	(200,000)	1	(200,000)	[1.5 marks]
1	77,000	0.909	69,993	[1.5 marks]
2	77,000	0.826	63,602	[1.5 marks]
3	77,000	0.751	57,827	[1.5 marks]
4	107,000	0.683	73,081	[1.5 marks]
		Net present value	64,503	[1.5 marks]

The company should purchase the machine as its net present value is positive. **[1 mark]**

(12 marks)

(Total: 25 marks)

- C3. (a)** The process of statistical analysis in a business context requires you to:
- Define the problem and the population for study, for example, the property prices in the two localities. **[1.5 marks]**
 - Develop the hypothesis for testing, for example, there are no differences in the property prices in the two localities. **[1.5 marks]**
 - Determine the sampling method and size of sample, for example, the choice of simple random sampling method. **[1.5 marks]**
 - Collect and tabulate the data for the sample chosen, for example, the presentation of the data in a bar chart. **[1.5 marks]**
 - Analyse and interpret the data for relevant information, for example, the dispersion of property prices in the two localities. **[1.5 mark]**
 - Write the possible conclusions from the analysis, for example, there are no differences in the property prices in the two localities. **[1.5 marks]**

(9 marks)

- (b)** The principles of data construction for easy comprehension may include:
- Simplicity in classification keeps details of data to the minimum, for example, bar charts on intervals of property prices to represent the data. **[1.5 marks]**
 - The table has a self-explanatory title and states the unit of measurement, for example, the property price per square foot in the two localities. **[1.5 marks]**
 - The headings should be concise and unambiguous with total and subtotals tallied, for example, frequencies on intervals of property prices are tallied. **[1.5 marks]**
 - The sources of the data must be stated, usually in a footnote, for examples, the data are from government statistics. **[1.5 marks]**

(6 marks)

- (c)** The standard deviation for locality X is
 $= \sqrt{514,400}$
 $= \$717$ **[2 marks]**

The standard deviation for locality Y is
 $= \sqrt{464,400}$
 $= \$681$ **[2 marks]**

(4 marks)

- (d)** The coefficient of variation for locality X is
 $= (\$717 / \$4,860) \times 100\%$
 $= 14.75 \%$ **[2 marks]**

The coefficient of variation for locality Y is
 $= (\$681 / \$4,800) \times 100\%$
 $= 14.18\%$ **[2 marks]**

Coefficient of variation presents standard deviation as a percentage of the mean. **[1 mark]** It provides a measure to compare variability between data sets. **[1 mark]**

(6 marks)

(Total: 25 marks)

[END OF SUGGESTED ANSWERS]