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Module 3 – Business Economics

This examination is divided into TWO sections.

- Section A (20%). This consists of TWENTY compulsory multiple choice questions. You should allocate approximately 36 minutes in total for Section A.
- Section B (80%). This consists of FIVE compulsory written questions. You should allocate approximately 2 hours and 24 minutes in total for Section B.

Suggested time allocation (by marks):

Marks	Approximate time in minutes
1	2
2	3
3	5
4	7
5	9
6	11
7	12
8	14
9	16
10	18
11	20
12	21
13	23
14	25
15	27
16	29
17	30
18	32
19	34
20	36

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SECTION A – MULTIPLE CHOICE QUESTIONS (Total 20 marks)

Answer **ALL** questions in this section. Choose the best answer for each question. Together they are worth 20% of the total marks for this examination.

Questions 1 to 20 carry 1 mark each. (20 marks – approximately 36 minutes)

1. Identify which of the following statements is NOT correct.
 - A Economics is a social science.
 - B Economics is essentially the study of how people make choices.
 - C If poverty were eliminated, there would be no need to study economics.
 - D The concept of trade-offs would become irrelevant if dealing with a one-person economy.

2. Identify the correct phrases to complete the following statement.

"In a business cycle, a trough refers to the _____ and a peak represents the _____."

 - A beginning of a recession; end of an expansion
 - B beginning of an expansion; end of a recession
 - C end of a recession; end of an expansion
 - D end of an expansion; end of a recession

3. Identify which of the following statements is correct.
 - A The problem of scarcity is a problem for poor countries only.
 - B The opportunity cost of a choice is the dollar amount paid to obtain it.
 - C Scarcity implies that people will always be poor.
 - D If a resource is unlimited in supply, it is not scarce.

4. Identify the best terms to complete the following statement.

"Government policymakers generally would like to have low _____ and high _____."

- A inflation; output growth and unemployment
 - B inflation and output growth; unemployment
 - C output growth and unemployment; inflation
 - D unemployment and inflation; output growth
5. State which of the following measures of central tendency is (are) most affected by including rare but very large positive/negative values.
- A Mean.
 - B Median.
 - C Mode.
 - D All of the above are correct.

6. Identify the best phrase to complete the following statement.

"In the short run, _____."

- A firms that suffer a loss will shut down
 - B firms act to minimise losses or maximise profits
 - C if existing firms are earning a profit, new firms will enter the industry
 - D All of the above are correct
7. Identify the best phrase to complete the following statement.

"In an imperfectly competitive industry, _____."

- A a firm has some control over the price of its output
- B a firm has no control over the price of its output
- C a firm can sell all of its output at whatever price it wants to charge
- D the government always need to regulate the output price

Answer Questions 8 to 9 with the information provided in the following scenario.

Below are the percentage returns of stocks (in descending order) of eight local banks for the past year:

25%, 18%, 16%, 13%, 8%, -2%, -5%, -10%

8. Calculate the median of the above set of stock returns.

- A 8%.
- B 13%.
- C 10.5%.
- D 15.25%.

9. Calculate the upper quartile of the above set of stock returns.

- A 18%.
- B 17%.
- C -3.5%.
- D -5%.

10. Identify the best phrase to complete the following statement.

"A simple random sample is a sample selected in such a way that each member of the population has _____."

- A a 1% chance of being included in the sample
- B a more than 50% chance of being included in the sample
- C some chance of being selected in the sample
- D an equal chance of being included in the sample

11. Outline a unique characteristic of oligopolistic market structure.

- A Low barriers to entry.
- B Mutual interdependence among firms.
- C Non-price competition.
- D Product differentiation.

12. Identify which of the following statements is NOT correct.
- A Marginal revenue is smaller than price at any positive output level in a monopoly.
 - B Diminishing marginal product suggests that the marginal product of an extra worker is less than the previous worker's marginal product.
 - C The two traditional branches of statistics are descriptive statistics and statistical inference.
 - D The two most commonly used protectionist methods by governments are subsidies and price control.
13. When the economy is operating at the full-employment output level, state what will be most likely to occur.
- A Cyclical unemployment is present.
 - B Frictional unemployment is absent.
 - C Natural rate of unemployment is zero.
 - D Structural unemployment is present.
14. Suppose a sample containing 49 monthly returns of Stability Fund has a mean return and standard deviation of 2.8% and 14%, respectively. Compute the standard error of the (sample) mean.
- A 2.8%.
 - B 2%.
 - C 0.4%.
 - D 0.2857%.
15. In a recent survey of 500 teenagers, 40% are found to be overweight. Determine the intervals that represents a 95% confidence interval of overweight teenagers.
- A 35.71% to 44.29%.
 - B 44.29% to 35.71%.
 - C 55.71% to 64.29%.
 - D 64.29% to 55.71%.

16. Identify which of the following statements is correct regarding a distribution that has a median less than its mean.
- A It has positive kurtosis.
 - B It is a symmetric distribution.
 - C It is positively skewed.
 - D None of the above.
17. Identify the correct terms to complete the following statement.
- "If Mr Huba received a salary increase and his marginal propensity to consume ("MPC") is positive but less than one, his consumption and savings can be expected to _____ and _____, respectively."
- A rise; rise
 - B rise; fall
 - C fall; fall
 - D fall; rise
18. Determine a correct phrase to complete the following statement.
- "Suppose nominal gross domestic product ("GDP") rose from \$200 billion to \$220 billion while the GDP deflator increased from 100 to 110. The real GDP _____."
- A remains constant
 - B increases
 - C decreases
 - D cannot be calculated from these figures
19. Calculate the coefficient of variation of an investment with a variance of 0.16 and expected return of 20%.
- A 0.8.
 - B 2.
 - C 8.
 - D Cannot be calculated from these figures.

20. Identify the correct terms to complete the following statement.

"If the cross-price elasticity of demand between chicken and pork is 1.2, then a 10% increase in the price of pork will result in a(n) _____ in the demand for chicken because they are _____."

- A decrease; substitutes
- B decrease; complements
- C increase; substitutes
- D increase; complements

* * * END OF SECTION A * * *

SECTION B – WRITTEN QUESTIONS (Total 80 marks)

Answer **ALL** questions in this section. Marks are indicated at the end of each question. Together they are worth 80% of the total marks for this examination.

Question 1 (14 marks – approximately 25 minutes)

- (a) Consider a hypothetical economy that produces and consumes only two items: Rice and Automobiles. The table below shows the data for two years.

	Year 2010	Year 2016
Price per metric ton of rice	HK\$400	HK\$400
Price of automobiles	HK\$5,000	HK\$6,000
Number of metric tons of rice produced	10,000	8,000
Number of automobiles produced	300	300

Required:

- (i) Using Year 2010 as the base year, calculate the percentage change of real GDP between the two years. Support your answer with workings. (5 marks)
- (ii) Based on the result in part (i), explain whether it can be concluded that the standard of living has changed between 2010 and 2016. (2 marks)
- (b) (i) Describe what an aggregate demand ("AD") curve is. (2 marks)
- (ii) Define fiscal policy and monetary policy. (3 marks)
- (iii) Explain how fiscal and monetary policies would affect the aggregate demand curve when it comes to stimulating economic activities in the short run. (2 marks)

Question 2 (9 marks – approximately 16 minutes)

Your friend plans to conduct a coin-toss experiment to test whether his coin is fair (i.e., not tampered with). As an economics student, you have been asked to advise on the following issues.

Required:

- (a) Describe hypothesis testing.** **(2 marks)**
- (b) Given the purpose of the experiment, state the null and alternative hypotheses.** **(2 marks)**
- (c) Contrast Type I and Type II errors. Determine how both types of error could be reduced at the same time.** **(3 marks)**
- (d) The coin-toss experiment has produced the following result: "100 tosses yielded 62 heads". Based on the result, determine a conclusion that could be drawn in respect of the hypothesis.** **(2 marks)**

Question 3 (10 marks – approximately 18 minutes)

- (a) Different countries (and territories) have different objectives when they design their own monetary policy. In the case of Hong Kong, the overriding objective of its monetary policy is currency stability.

Required:

- (i) Explain the TWO primary types of exchange rate regimes. (3 marks)
- (ii) Describe Hong Kong's exchange rate regime and state ONE reason that supports the continuing adoption of the system. (3 marks)
- (b) The term "Impossible Trinity" in international economics refers to the phenomenon that an economy will only be able to achieve at most two of the following three conditions simultaneously: (i) fixed exchange rate, (ii) free international capital movement, and (iii) independent monetary policy.

Required:

State the TWO conditions being fulfilled in Hong Kong and the TWO conditions in China.

(4 marks)

Question 4 (24 marks – approximately 43 minutes)

- (a) Explain the difference between market economy and planned economy in terms of their resource allocation mechanisms. (4 marks)

- (b) Consider the following market supply and demand functions for gasoline (in million gallons):

$$Q_s = 20 + 2P$$

$$Q_d = 170 - P$$

where Q_s = Quantity supplied

Q_d = Quantity demanded

P = Market price

Required:

- (i) Illustrate the theories of the "Law of Demand" and "Law of Supply" based on the supply and demand functions above. (4 marks)

- (ii) Solve for the market equilibrium. (4 marks)

- (iii) If the government sets the price ceiling of gasoline at HK\$40 per gallon, determine the quantity of excess demand / supply at HK\$40. (4 marks)

- (iv) Suppose the price of renewable energy has gone down significantly as a result of a more favourable government policy. Specifically, the demand for gasoline has decreased by 30 million gallons. Determine how this change would affect the equilibrium. Support your answer with calculations. (4 marks)

- (v) "A decrease in the supply of gasoline resulting from a change in a non-price factor will cause a shortage in the market."

Justify whether this statement is true or false.

(4 marks)

Question 5 (23 marks – approximately 42 minutes)

- (a) Explain the difference between a population and a sample. (2 marks)
- (b) Explain sampling error. State the formula that shows the relationship amongst sampling error, population parameter and sample statistic. (4 marks)
- (c) An international fund house is conducting a performance evaluation of its in-house fund managers. As part of the initial process, you (a junior analyst) are asked to prepare some dispersion measures on fund returns. The table below shows the 3-year annualised total returns for four out of ten fund managers of the company (referred to as A, B, C and D).

<i>Manager</i>	A	B	C	D
<i>Return</i>	30%	18%	4%	20%

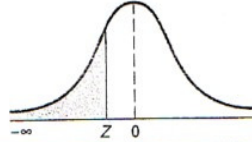
Required:

- (i) Outline the difference between time-series and cross-section data. Identify what type of data in the data set of the table belongs to. (3 marks)
- (ii) Compute the range and the mean absolute deviation ("MAD") of the investment returns of the four fund managers. Interpret the two values. (6 marks)
- (iii) Compute the standard deviation of returns. (3 marks)
- (iv) Standard deviation, as a risk measure, is different from the typical idea of risk being viewed as "unexpectedly bad outcome". Justify whether this statement is true or false. (3 marks)
- (v) Explain why there is a difference in value between the MAD and standard deviation in parts (ii) and (iii) above. (2 marks)

* * * END OF EXAMINATION PAPER * * *

APPENDIX

The Cumulative Standardised Normal Distribution



Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z .

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
-3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
-3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
-3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00103	0.00100
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2388	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2482	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

Module 3

Business Economics



Answers



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SECTION A – MULTIPLE CHOICE QUESTIONS (Total: 20 marks)

Questions	Answers	Marks allocation
1.	C	1
2.	C	1
3.	D	1
4.	D	1
5.	A	1
6.	B	1
7.	A	1
8.	C	1
9.	B	1
10.	D	1
11.	B	1
12.	D	1
13.	D	1
14.	B	1
15.	A	1
16.	C	1
17.	A	1
18.	A	1
19.	B	1
20.	C	1

* * * END OF SECTION A * * *

SECTION B – WRITTEN QUESTIONS (Total: 80 marks)

Answer 1(a)(i)

$$\begin{aligned}\text{Real GDP}_{2010} &= (P_{\text{Rice}}^{2010} \times Q_{\text{Rice}}^{2010}) + (P_{\text{Automobile}}^{2010} \times Q_{\text{Automobile}}^{2010}) \\ &= (\text{HK\$}400 \times 10,000) + (\text{HK\$}5,000 \times 300) = \text{HK\$}5,500,000\end{aligned}$$

$$\begin{aligned}\text{Real GDP}_{(2016)} &= (P_{\text{Rice}}^{2010} \times Q_{\text{Rice}}^{2016}) + (P_{\text{Automobile}}^{2010} \times Q_{\text{Automobile}}^{2016}) \\ &= (\text{HK\$}400 \times 8,000) + (\text{HK\$}5,000 \times 300) = \text{HK\$}4,700,000\end{aligned}$$

Percentage change between 2010 and 2016 in

$$\text{Real GDP} = \frac{\text{HK\$}4.7\text{m} - \text{HK\$}5.5\text{m}}{\text{HK\$}5.5\text{m}} = -14.55\%$$

Answer 1(a)(ii)

Standard of living is generally measured by real GDP per capita (i.e. real GDP divided by the size of population). Without population data being provided, the decrease in real GDP itself, as calculated in part (i), cannot be concluded as a decrease in the standard of living.

Answer 1(b)(i)

The aggregate demand curve shows graphically the total amount of all (final) goods and services demanded by households, firms, the government and the rest of the world at various price levels.

Answer 1(b)(ii)

Fiscal policy refers to a government's use of spending and taxation to influence a nation's economy.

Monetary policy refers to a central bank's use of changes in interest rates or in money supply to influence a nation's economy.

Answer 1(b)(iii)

The government (monetary authority such as central bank included) uses fiscal and / or monetary policy to shift the aggregate demand curve to the right so as to stimulate economic activities in the short run.

Answer 2(a)

Hypothesis testing is a statistical procedure for assessing two mutually exclusive statements regarding a given population to determine which statement is best supported by the sample data.

Answer 2(b)

The null hypothesis (H_0): The coin is fair / unbiased

The alternative hypothesis (H_a): The coin is biased

Answer 2(c)

Type I error refers to the probability of incorrectly rejecting the null hypothesis when it happens to be true.

Type II error refers to the probability of incorrectly retaining the null hypothesis when it should be rejected.

The only way to reduce both types of error at the same time is to increase the sample size.

Answer 2(d)

The researcher would be inclined to reject the null hypothesis that the coin is fair (as the outcome is much higher than the expected outcome of 50), although it is possible / conceivable that the conclusion might be wrong.

Answer 3(a)(i)

Floating (or flexible) exchange rate: The external value of the domestic currency is basically determined by market supply and demand for the currency, rather than by the government.

Fixed (or pegged) exchange rate: The external value of the domestic currency is set at a certain level by the government with persistent interventions in the foreign exchange market.

Answer 3(a)(ii)

Hong Kong's exchange rate system is a specific form of fixed rate system, known as currency board, that keeps the Hong Kong dollar pegged to the US dollar at a rate of 7.8 (HK dollars for every one US dollar).

Being a highly externally-oriented economy, Hong Kong's exchange rate stability is critically important to Hong Kong's major economic growth driver (exports and imports).

Answer 3(b)

Hong Kong: Fixed exchange rate and free capital movement

China: Managed exchange rate and independent monetary policy

Answer 4(a)

A market economy (also called capitalist economy) is an economic system that relies on the market force (i.e., interaction of demand and supply) and price to allocate resources.

A planned economy (also called socialist / command economy) is an economic system that relies on government commands / directives to allocate resources.

Answer 4(b)(i)

The negative sign in front of the price variable in the demand function implies that price and quantity demanded are inversely related, as stated by the Law of Demand.

The positive sign in front of the price variable in the supply function implies that price and quantity supplied are positively related, as stated by the Law of Supply.

Answer 4(b)(ii)

At equilibrium,

$$20 + 2P^* = 170 - P^*$$

$$P^* = \text{HK\$}50$$

$$Q^* = 120 \text{ (using either demand or supply function)}$$

Answer 4(b)(iii)

$$\text{At HK\$}40, Q_S = 20 + 2(40) = 100$$

$$Q_D = 170 - 40 = 130$$

Create shortage (excess demand) of 30 million gallons at the price of HK\$40.

Answer 4(b)(iv)

With the demand curve shift to the left (downward), the new equilibrium is:

$$20 + 2P^* = (170 - 30) - P^*$$

$$P^* = 40$$

$$Q^* = 100 \text{ (using either new demand function or supply function)}$$

Answer 4(b)(v)

False. A decrease in supply will not cause a shortage as long as prices of gasoline are allowed to adjust freely (i.e., rise when supply decreases). The market for gasoline will clear at a higher equilibrium price and lower quantity.

Answer 5(a)

A population refers to a collection of data of interest for a given question or experiment. A sample is a subset of data drawn from that population.

Answer 5(b)

Sampling error refers to the difference between a sample statistic (e.g. the mean or the standard deviation of the sample) and the parameter of the population (the true mean or standard deviation of the population) from which the sample is drawn.

Sampling error = Sample statistic – Population parameter

Answer 5(c)(i)

Time series data is a set of data points in successive order, usually collected at discrete and equally-spaced intervals of time.

Cross-sectional data are data on some characteristic of the subjects of interest at a single point in time.

The data in the table is cross-sectional (as it is the 3-year annualised return for four fund managers).

Answer 5(c)(ii)

Range = 30% – 4% = 26%

Mean return = (30 + 18 + 4 + 20) / 4 = 18%

Mean Absolute Deviation (MAD)

$$= \frac{[(|30 - 18|) + (|18 - 18|) + (|4 - 18|) + (|20 - 18|)]}{4} = 7\%$$

Interpretation of range: The average yearly performance between the best and worst fund managers is 26% over the 3-year period of study.

Interpretation of MAD: On average, an individual fund manager's return performance will deviate ±7% from the group's mean return of 18%.

Answer 5(c)(iii)

$$\sigma = \left\{ \frac{\left[(30 - 18)^2 + (18 - 18)^2 + (4 - 18)^2 + (20 - 18)^2 \right]}{4 - 1} \right\}^{1/2} = 10.71\%$$

Answer 5(c)(iv)

True. Standard deviation treats any (positive and negative) deviations from the mean return equally as risk. As a result, both unexpectedly good and bad investment outcomes will render the statistic's value larger and the investment will be concluded to be more risky.

Answer 5(c)(v)

The mean absolute deviation (MAD) will always be less than or equal to the standard deviation because large deviations from the mean are weighted more heavily in standard deviation calculations than in the MAD.

* * * END OF EXAMINATION PAPER * * *