

# INSTITUTE AND FACULTY OF ACTUARIES



## EXAMINATION

20 April 2018 (am)

### Subject CT7 – Business Economics Core Technical

*Time allowed: Three hours*

#### **INSTRUCTIONS TO THE CANDIDATE**

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all 37 questions. Answers to questions 1–26 should be indicated on the Multiple Choice Answer Sheet included in your booklet. From question 27 onwards begin your answer to each question on a new page.*
6. *Candidates should show calculations where this is appropriate.*

***Graph paper is NOT required for this paper.***

#### **AT THE END OF THE EXAMINATION**

*Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.*

*In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.*

- 1** Which of the following statements below is always TRUE?
- A Opportunity cost is equal to total revenue minus total variable cost.
  - B Opportunity cost is constant.
  - C Opportunity cost is the cost in terms of the best foregone alternative.
  - D Opportunity cost is the addition to total cost of producing one extra unit of a good.
- [1½]
- 2** Which one of the following will shift the supply curve for Good X to the left?
- A a decrease in labour productivity in industry X
  - B a fall in the price of raw materials used to produce Good X
  - C a decrease in wages in industry X
  - D a government subsidy on the production of Good X
- [1½]
- 3** Good X is an inferior good. A fall in consumer income when the supply curve for Good X is positively sloped will cause which one of the following?
- A the demand for Good X to fall and price of Good X to fall
  - B the demand for Good X to fall and price of Good X to rise
  - C the demand for Good X to rise and price of Good X to fall
  - D the demand for Good X to rise and price of Good X to rise
- [1½]
- 4** In relation to insurance, the term moral hazard suggests:
- A people who know they are a bad risk are more inclined to take out insurance.
  - B people who know they are a bad risk are less inclined to take out insurance.
  - C a policyholder may act in a way which makes an insured event less likely to occur.
  - D a policyholder may act in a way which makes an insured event more likely to occur.
- [1½]

- 5** Assuming that the marginal and average cost curves are unchanged then, following a shift in the demand curve to the right, firms in a perfectly competitive industry will:
- A raise their price in the short run but restore the price back to its original level in the long run.
  - B keep their price constant in both the short run and the long run.
  - C raise their price in both the short run and the long run.
  - D keep their price constant in the short run but raise their price in the long run.
- [1½]
- 6** The profit maximising output for a monopoly is at the point where the:
- A marginal cost curve cuts the demand curve.
  - B marginal cost curve cuts the marginal revenue curve.
  - C average cost curve cuts the marginal revenue curve.
  - D average cost curve cuts the demand curve.
- [1½]
- 7** Which one of the following is NOT a barrier to entry into a monopoly market?
- A significant economies of scale
  - B heavy potential advertising costs
  - C large capital requirements
  - D constant returns to scale
- [1½]
- 8** A firm is selling 1,000 units of output at a price of £20, with a marginal cost of £5 and average variable cost of £8 at that level of output. What is the supernormal profit that the monopoly firm is making?
- A £15,000
  - B £12,000
  - C £7,000
  - D not possible to calculate from the information given
- [1½]

- 9** Which one of the following statements about market structures is FALSE?
- A Under perfect competition, in the long run all firms produce where marginal costs equal average revenue.
  - B Under monopolistic competition firms produce differentiated products.
  - C Under oligopoly, firms make decisions taking into account the possible reactions of their competitors.
  - D Under monopoly, a profit maximising firm with positive marginal costs always produces in the region of price inelastic demand.
- [1½]

- 10** Under the Cournot model of duopoly, a firm:
- A attempts to maximise sales after assuming that the other firm will attempt to maximise sales.
  - B assumes the other firm will produce a given output and then chooses its profit maximising output.
  - C assumes the other firm's price is given and then chooses its profit maximising price.
  - D will attempt to collude with the other firm so as to set a price and output level which will maximise industry level profits.
- [1½]

- 11** Which one of the following is NOT one of the four phases associated with the product life cycle theory?
- A The launch phase
  - B The growth phase
  - C The innovation phase
  - D The decline phase
- [1½]

**12** Which one of the following definitions is most compatible with the Basel III definition of capital adequacy?

- A Tier 1 plus Tier 2 capital divided by total assets
- B Tier 1 plus Tier 2 capital divided by risk weighted assets
- C Tier 1 capital divided by total assets
- D Tier 1 capital divided by risk weighted assets

[1½]

**13** Which of the following will result in a deterioration in the domestic country's terms of trade?

- A a rise in the average price of exports relative to the average price of imports
- B a rise in the average price of imports relative to the average price of exports
- C an appreciation of the domestic currency
- D a rise in the domestic country's terms of trade index from 100 to 120

[1½]

**14** Which one of the following is most likely to be the best method of reducing long term structural unemployment?

- A expansionary fiscal policy
- B expansionary monetary policy
- C better education and training
- D a reduction in trade union powers

[1½]

**15** If a country has a current account surplus then:

- A Gross Domestic Product is greater than Gross National Income.
- B Gross Domestic Product is less than Gross National Income.
- C Gross Domestic Product is the same as Gross National Income.
- D we cannot say whether Gross Domestic Product differs from Gross National Income from this information.

[1½]

- 16** A country with a population of 20 million has 15 million in employment and 1 million unemployed. What is the unemployment rate?
- A 4.76%
  - B 5.0%
  - C 6.25%
  - D 6.67%
- [1½]

- 17** Which of the following could explain why a country's aggregate demand curve might shift outwards to the right?
- A an increase in interest rates
  - B a depreciation in its exchange rate
  - C a fall in government expenditure
  - D a decrease in business confidence
- [1½]

- 18** The business cycle is defined as:
- A the annual cycle of output.
  - B the long run trend path of output after removing short run variations.
  - C the periodic fluctuations of output around the long run trend.
  - D none of the above.
- [1½]

**19** If the rate of inflation is higher than the anticipated rate used for negotiating interest rates and wages:

- A lenders will gain at the expense of borrowers and employers will gain at the expense of workers.
- B lenders will gain at the expense of borrowers and workers will gain at the expense of employers.
- C borrowers will gain at the expense of lenders and employers will gain at the expense of workers.
- D borrowers will gain at the expense of lenders and workers will gain at the expense of employers.

[1½]

**20** Other things being equal, an increase in the level of real output in an economy will result in:

- A a rise in the value of the fiscal multiplier.
- B a decrease in the transactions demand for money.
- C a rise in the rate of interest.
- D an increase in the speculative demand for money.

[1½]

**21** An unexpected fall in the price level which causes a temporary rise in the real wage rate may:

- A give an actual rate of unemployment which is temporarily greater than the natural rate.
- B give an actual rate of unemployment which is temporarily lower than the natural rate.
- C increase the natural rate of unemployment.
- D decrease the natural rate of unemployment.

[1½]

- 22** The accelerator theory implies that:
- A investment is determined by the rate of change of national income.
  - B national income is determined by the rate of change of investment.
  - C investment is increased when interest rates fall.
  - D national income is increased when interest rates fall.
- [1½]
- 23** As a result of a change in economic policy, interest rates and consumption rise but investment falls. The new policy is most likely to have been:
- A an expansionary fiscal policy.
  - B an expansionary monetary policy.
  - C a contractionary fiscal policy.
  - D a contractionary monetary policy.
- [1½]
- 24** The introduction of an expansionary monetary policy in an open economy operating with a flexible exchange rate would most likely lead to:
- A higher domestic interest rates and an appreciation of the domestic currency.
  - B higher domestic interest rates and a depreciation of the domestic currency.
  - C lower domestic interest rates and an appreciation of the domestic currency.
  - D lower domestic interest rates and a depreciation of the domestic currency.
- [1½]
- 25** Which of the following is a supply side economic policy aimed at promoting economic growth?
- A increases in social security benefits designed to increase expenditures of unemployed workers
  - B measures designed to increase trade union powers so that real wage rises can increase expenditures of employed workers
  - C increases in Tariffs designed to increase production of domestic goods
  - D reduction in corporate taxation
- [1½]



- 26** Which one of the following will NOT happen following a devaluation of the domestic currency on the foreign exchange market?
- A Exports become cheaper when measured in the foreign currency.
  - B Imports become more expensive when measured in the domestic currency.
  - C Export volumes will decrease.
  - D Import volumes will decrease.
- [1½]

- 27** Draw a diagram for each of (i) to (iv), to illustrate the impact of the change on the quantity of a Good X demanded and supplied. Good X is a normal good. Each change should be considered in isolation.

- (i) a fall in the price of a complementary good [1]
- (ii) a government tax on the production of Good X [1]
- (iii) a fall in consumers' incomes [1]
- (iv) a rise in labour productivity in the industry that produces Good X [1]

You should label the demand curve as D1, the supply curve as S1 and price and quantity as P1 and Q1 respectively, when illustrating the position before the introduction of the change. You should label any new supply and demand curves as S2 and D2 respectively and the new price and quantity as P2 and Q2.

[Total 4]

- 28** Draw a diagram for each of (i) and (ii) illustrating the profit maximising price and output of a firm operating under conditions of monopolistic competition to show the firm making:

- (i) excess profits, clearly indicating the total excess profits. [2]
- (ii) a loss, clearly indicating the total loss. [2]

You should label the curves on each diagram as: MR for Marginal Revenue, AR for Average Revenue, MC for Marginal Cost, AC for Average Cost. Price and Quantity should be labelled P1 and Q1 respectively and the average cost per unit as C1.

- (iii) Explain whether the firm under monopolistic competition will make excess profits in the long run. [1]
- [Total 5]

- 29** The table below shows two points on the demand curve for Good X.

	<i>Point 1</i>	<i>Point 2</i>
Quantity demanded of Good X	250	300
Price of Good X	50	45

- (i) Calculate the own price elasticity of demand to two decimal places using the average formula. [1]

The table below shows two points on the supply curve for Good X.

	<i>Point 3</i>	<i>Point 4</i>
Quantity supplied of Good X	100	110
Price of Good X	60	65

- (ii) Calculate the own price elasticity of supply to two decimal places using the average formula. [1]

The table below shows how demand for Good X changes in response to a rise in consumers' income.

	<i>Point 5</i>	<i>Point 6</i>
Quantity demanded of Good X	250	280
Consumers' income	50	70

- (iii) (a) Calculate the income elasticity of demand to two decimal places using the average formula.
- (b) State if the good is a normal or inferior good. [1]

The table below shows how demand for Good X changes in response to a change in the price of Good Y.

	<i>Point 7</i>	<i>Point 8</i>
Quantity demanded of Good X	250	220
Price of Good Y	60	65

- (iv) (a) Calculate the cross price elasticity of demand for Good X with respect to the price of Good Y to two decimal places using the average formula.
- (b) State if Good X and Good Y are substitutes or complements. [1]
- [Total 4]

- 30** (i) Describe the difference between risk-neutral economic agents and risk-averse economic agents in terms of risk and return. [2]

The payment an insurance company will have to make in the case of an adverse event is €500 and the probability of an adverse event occurring is 0.3. The utility for any level of capital of a particular insurer is given by:

$$U = 5,000 + 0.8C$$

where  $U$  is utility and  $C$  is capital.

The insurer's initial level of capital is €3,000.

- (ii) Calculate the minimum insurance premium the insurer will require in order to take on the risk of the adverse event occurring. [3]  
[Total 5]

- 31** (i) Define the external cost of consumption, including an example. [2]
- (ii) Draw a diagram showing the marginal social benefit curve and marginal private benefit curve when a negative externality in consumption exists. You should show on your diagram, the quantity that would be consumed at the market price  $P_1$  by the private sector as  $Q_1$  and the socially optimal level of consumption as  $Q_2$ . [2]  
[Total 4]

- 32** (i) Describe what is meant by a floating exchange rate. [1]
- (ii) Describe what a movement in the exchange rate of US dollars to UK pounds from \$1.50/£1 to \$1.30/£1 would imply for the cost of UK imports from the United States. [1]
- (iii) Explain FOUR advantages of a floating exchange rate for a country. [4]  
[Total 6]

**33** Labour is the only factor of production in countries A and B.

In Country A, production of 1 unit of Good X requires 5 hours of labour input and 1 unit of Good Y requires 10 hours of labour input.

In Country B, production of 1 unit of Good X requires 4 hours of labour input and 1 unit of Good Y requires 5 hours of labour input.

- (i) State which country has a comparative advantage in producing Good X. [1]
- (ii) Calculate the opportunity cost of producing a unit of Good Y in Country A. [1]
- (iii) State which good Country B will export to Country A according to the principle of comparative advantage. [1]
- (iv) State which ONE of the following is a valid terms of trade between the two countries at which they will both benefit from trade:
  - A 2.5 units of Good X for 1 unit of Good Y
  - B 1.5 units of Good X for 1 unit of Good Y
  - C 1 unit of Good X for 1 unit of Good Y
  - D 0.5 units of Good X for 1 unit of Good Y

[1]

[Total 4]

- 34**
- (i) Draw the aggregate supply curve. [1]
  - (ii) Explain why the aggregate supply curve for a closed economy slopes upward from left to right. [1]
  - (iii) Give TWO factors that may shift the aggregate supply curve to the left in a closed economy. [2]
  - (iv) Outline how a fall in the price of oil is likely to affect the aggregate supply curve in an oil importing country. [1]
- [Total 5]

- 35**
- (i) Describe equilibrium (voluntary) unemployment and disequilibrium (involuntary) unemployment. [2]
  - (ii) Outline TWO reasons which are likely to raise the level of voluntary unemployment in the economy in the long run. [2]
- [Total 4]

- 36** Discuss the advantages, disadvantages and potential problems associated with using fiscal policy and monetary policy to boost economic activity in an open economy. [10]
- 37**
- (i) Discuss methods by which a supermarket chain can differentiate its product offerings from those of its competitors. [3]
  - (ii) Assess the factors which have increased the sale of supermarkets' own brands in the past decade. [3]
  - (iii) Analyse, with reference to appropriate diagrams, the short-run and the long-run effects of advertising on a supermarket's sales and profitability. [4]
- [Total 10]

**END OF PAPER**