

**UNIVERSITY OF ZAMBIA**  
**SCHOOL OF PUBLIC HEALTH**  
**DEPARTMENT OF HEALTH POLICY AND MANAGEMENT**  
**HEALTH ECONOMICS (HPM 4235) TEST 1**  
**DATE: 8<sup>th</sup> OCTOBER, 2024**  
**TIME ALLOWED – 2 HOURS**

**INSTRUCTIONS**

1. Answer **ALL** questions in **SECTION A** and **THREE QUESTIONS** in **SECTION B**
2. **SECTION A** has True or False and explain questions. For **EACH** question indicate whether the statement is true or false and briefly **EXPLAIN WHY in not more than 3 sentences.**
3. **SECTION B** has 4 short answer questions. **Answer any THREE QUESTION of your choice.**

**SECTION A : ANSWER ALL QUESTIONS IN THIS SECTION**

**State whether the following are true or false and provide a brief explanation. Each Question carries 2 marks.**

1. Insurance works best when the losses that are incurred are indefinite or unknown.
2. Moral hazard occurs when individuals become more careless or take advantage of insurance coverage because they are insulated from the full costs
3. Competitive insurance markets may drive premiums down to the point where no insurer makes a profit
4. Inelastic demand for medical care means that a price increase will significantly reduce the quantity demanded and thus increase moral hazard
5. Moral hazard only occurs when there is insurance coverage that fully eliminates the out-of-pocket costs for services
6. If a treatment is both more cost-effective and more effective in delivering health benefits than another, the latter is said to dominate the former
7. The Cost effectiveness frontier shows the subset of treatment strategies which are not dominated by any other treatment
8. If a treatment is deemed cost effective from the social planner's perspective then it is also cost effective from the patients' perspective
9. A quality adjusted life year measures the expected years a person will live, weighted by the discounted quality of life for each of those years

10. When the National Health Insurance Scheme declines coverage for non-cost-effective treatment this can be considered as an example of rationing
11. When the elasticity of substitution between two inputs of production (such as doctors and nurses) is equal to 0, it means that there is perfect substitutability of inputs (i.e., doctors and nurses are interchangeable)
12. If marginal cost is greater than average cost, then the cost of one additional unit of output must cause the average to rise.
13. The average cost curve is 'U' shaped because of increasing returns to scale followed by decreasing returns to scale.
14. If a pharmaceutical company can produce two drugs at a lower cost than the sum of the cost of producing two drugs separately then the company has achieved economies of scope.
15. Government failure occurs when an economic policy or the inactivity of the government worsens the market allocation of resources reducing economic welfare

**SECTION B; THERE ARE 4 QUESTIONS IN THIS SECTION ANSWER ANY THREE (3) QUESTIONS; Each Question carries 10 marks.**

1. A Laboratory Technician from Health First Laboratory takes 20 minutes to complete a blood draw. The supplies for each draw cost K5, and the Laboratory Technician earns K40 per hour. The laboratory is designed to accommodate 30,000 draws per year. Its rent that also covers utilities is K120,000 per year. The table below presents different amounts of blood draws for each year.

**Table 1: Number of Blood Draws at Health First Laboratory**

<b>Volume/Quantity of Blood Draws</b>	<b>Total Cost</b>	<b>Average Cost</b>	<b>Marginal Cost</b>
0			
10,000			
20,000			
30,000			
45,000			

- a) What are the average and marginal costs of a blood draw when the volume is as described in Table 1?
  - b) What principle does your calculation illustrate?
2. Tisauke has the following health insurance information
- Deductible – K150
  - Coinsurance rate – 10%
  - Maximum Amount Covered – K20,000

Suppose Tisauke falls ill and incurs medical expenses equal to K15,000

- a) How much will she pay out-of-pocket?
  - b) What percentage of her expenses will this be?
  - c) If Tisauke’s probability of getting sick is 0.1 (10%) per year, her annual premium is K2400 and the maximum payout per year is K20,000 is the premium that she is paying actuarially fair?
3. Suppose Mr. Sikota faces a probability of prostate cancer illness of 15% and sought insurance of K80,000. LiveWell Insurance charge him a 20% premium per annum and it costs them K950 annually to process each policy and potentially write a claim check.
- a) Calculate the profits per policy that LiveWell insurance will earn from this per annum.
  - b) Suppose LiveWell insurance is in a perfectly competitive market, what would the competitive premium price be?
4. Suppose the government is trying to determine the cost effectiveness for different treatments for an outbreak of a new disease called Novelpox. The table shows different treatments and their effects.

**Table 2: Treatments, Costs and QALYs associated with Novelpox**

<b>Treatment</b>	<b>Cost (ZMW)</b>	<b>Effectiveness (QALYS)</b>
Do Nothing	0	0
Treatment A	500	20
Treatment B	700	25

Treatment C	1000	45
-------------	------	----

- a) Plot these four treatments on cost (X AXIS) QALY's (Y AXIS) axes. Create a cost-effectiveness frontier by connecting potentially cost-effective treatments.
- b) Calculate the ICER between Treatment A and Treatment B
- c) Calculate the ICER between Treatment C and Treatment B.