Part A: Choose the best answer for the following 28 questions. Make only one choice for each question. (56 marks)

1. One difference between a closed economy and an open economy is that:
   A) in the latter, foreign savings complement domestic savings in financing investment spending.
   B) in the latter, the government is more open to the idea of financing investment spending than in the former.
   C) in the former, foreign savings complement domestic savings in financing investment spending.
   D) in the former, foreign savings finance more investment spending than in the latter.

2. National savings in a closed economy is all of the following, EXCEPT:
   A) the sum of private savings plus the government budget balance.
   B) the total savings generated within the economy.
   C) GDP - C - G.
   D) government spending minus consumption.

3. In a closed economy government spending was $30 billion, consumption was $70 billion, taxes were $20 billion, and GDP was $110 billion this year. Investment spending was $10 billion. As a result:
   A) private savings were equal to $10 billion.
   B) the government's budget balance was equal to a surplus of $10 billion.
   C) net savings were equal to $0.
   D) private savings were equal to $20 billion.

Use the following to answer questions 4-8:

**Scenario: Open Economy**

In an open economy the GDP is $12 million this year. Consumption is $8 million, and government spending is $2 million. Taxes are $0.5 million. Exports are $1 million, and imports are $3 million.

4. How much is private saving?
   A) $4 million
   B) $2.5 million
   C) $3.5 million
   D) $1.5 million

5. What is the government budget balance?
   A) a surplus of $1.5 million
   B) a deficit of $1.5 million
   C) a deficit of $0.5 million
   D) a surplus of $3.5 million
6. How much is national saving?
   A) $4 million
   B) $3.5 million
   C) $2 million
   D) $5.5 million

   \[ S_{nat} = 3S + (\frac{G}{100}) = 2 \]

7. How much is the net capital inflow?
   A) $1 million
   B) $2 million
   C) $3 million
   D) $4 million

   \[ NFL = X - IM = 1 - 3 = -2 \]

8. How much is investment spending?
   A) $2 million
   B) $3 million
   C) $3.5 million
   D) $4 million

   \[ I = 2 - (3) = 4 \]

9. The correct relationship between taxes and private savings is given by:
   A) taxes equals government spending plus private savings.
   B) taxes equals total spending minus consumption minus investment minus private savings.
   C) taxes equals total income minus consumption minus private savings.
   D) taxes equals consumption plus private savings plus total income.

10. In an open economy where government spending was $30 billion, consumption was $70 billion, taxes were $20 billion, and GDP was $100 billion this year, investment spending was $10 billion. As a result, there was:
    A) a net capital inflow of $10 billion.
    B) capital inflows of $10 billion and capital outflows of $20 billion.
    C) a trade surplus of $20 billion and a financial deficit of $20 billion.
    D) a net capital outflow of $10 billion.

11. If private savings increase:
    A) the demand for loanable funds will increase, interest rates will increase, and the amount of borrowing will increase.
    B) the demand for loanable funds will decrease, interest rates will decrease, and the amount of borrowing will decrease.
    C) the supply of loanable funds will increase, interest rates will decrease, and the amount of borrowing will increase.
    D) the supply of loanable funds will decrease, interest rates will increase, and the amount of borrowing will decrease.
12. Crowding out means:
A) private savings decreases when the government borrows money.
B) private investment decreases when the government borrows money.
C) there are too many players in the financial markets.
D) some bondholders will be squeezed out of the market.

13. Your textbook costs $90, and you can resell it in one year's time for $45. If the annual interest rate is 10%, then the present value of the textbook's resale value (to the nearest dollar) is:
A) $90.
B) $41.
C) $45.
D) $37.

14. You are the CEO of a company. You have an opportunity to undertake the following project: pay $1000 today and receive $1200 a year from now. If the annual interest rate is 20%, the difference between the present value of the benefits and the cost of the project is:
A) $400.
B) $200.
C) $166.
D) $0.

15. You are given the choice of receiving $100 today or $115 one year from today. What annual interest rate will make you indifferent between these two choices?
A) 5%
B) 10%
C) 15%
D) 20%

16. If you are paid $5500 in one year on a $5000 loan made today, then your annual interest rate is:
A) 0%.
B) 10%.
C) 15%.
D) 20%.

17. A household's wealth is:
A) what a household earns each period.
B) what a household saves each period.
C) the value of a household's accumulated savings.
D) the value of a household's financial assets.

18. If the MPS = 0.1, then the value of the multiplier equals:
A) 5.
B) 10.
C) 9.
D) 10.

19. If the multiplier equals 4, then the marginal propensity to save must be equal to:
A) 1/4.
B) 1/2.
C) 3/4.
D) the marginal propensity to consume.

\[
MPC = \frac{1}{4} = 0.25
\]

\[
MPS = 0.25
\]
\[ \Delta Y = \frac{1}{1 - MPC} \quad \Delta I = \frac{1}{1 - \epsilon} (100) = 500 \]

20. Suppose that the marginal propensity to consume is 0.8, and investment spending increases by $100 billion. The increase in aggregate demand is:
   A) $100 billion, the same amount as investment spending.
   B) $125 billion, composed of $100 billion in investment spending and $25 billion in consumption.
   C) $80 billion, composed of $100 billion in investment spending and a decrease in consumption of $20 billion.
   D) $500 billion, composed of $100 billion in investment spending and $400 billion in consumption.

21. If disposable income increases by $5 billion and consumer spending increases by $4 billion, the marginal propensity to consume is equal to:
   A) 20.
   B) 0.8.
   C) 1.25.
   D) 9.

22. If your disposable income increases from $10 000 to $15 000 and your consumption increases from $9000 to $12 000, your \( MPC \) is:
   A) 0.2.
   B) 0.4.
   C) 0.6.
   D) 0.8.

23. The ______ the ______, the ______ the multiplier.
   A) smaller; level of wealth; bigger
   B) bigger; MPS; bigger
   C) bigger; MPC; smaller
   D) bigger; MPC; bigger

24. If \( MPS \) is small, it will:
   A) make the multiplier smaller.
   B) make the multiplier larger.
   C) not affect the value of the multiplier.
   D) increase the interest rate.
Use the following to answer questions 25 - 28:

Figure: Consumption and Real GDP

25. The slope of the consumption function is called the:
   A) marginal propensity to save.
   B) average propensity to consume.
   C) marginal propensity to consume.
   D) marginal consumption increment.
   
   **C**

26. The marginal propensity to consume in this example is:
   A) 0.
   B) 0.5.
   C) 1.0.
   D) 2.0.

   **B**

   \[ MPC = \frac{z - 1}{z - c} = 0.5 \]

27. If real GDP is $4 million, consumption is _______ million.
   A) $0.75
   B) $1
   C) $3
   D) $4

   **C**

28. Which of the following represents the aggregate consumption function?
   A) \( C = 1 + 0.7YD \).
   B) \( C = 2 + 0.7YD \).
   C) \( C = 1 + 0.5YD \).
   D) \( C = 2 + 0.5YD \).

   **C**
Part B: ANSWER ALL QUESTIONS. Must show your work clearly on the space provided, otherwise, no mark will be given. (59 marks)

1. GDP. A certain economy with only three simple goods produced: (33 marks)

<table>
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<th>YEAR</th>
<th>GOOD A</th>
<th>GOOD B</th>
<th>GOOD C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Price</td>
<td>Quantity</td>
</tr>
<tr>
<td>YEAR 1</td>
<td>10</td>
<td>5.0</td>
<td>7</td>
</tr>
<tr>
<td>YEAR 2</td>
<td>11</td>
<td>4.5</td>
<td>9</td>
</tr>
<tr>
<td>YEAR 3</td>
<td>9</td>
<td>5.0</td>
<td>8</td>
</tr>
</tbody>
</table>

Year 2 is the base year.

(a). Calculate the Nominal GDP for all three years. (3 marks)

\[ \text{GDP}_1 = 5 \times (10) + 2 \times (7) + 5 \times (3) = \$79 \]

\[ \text{GDP}_2 = 4.5 \times (11) + 3 \times (9) + 4.5 \times (5) = \$99 \]

\[ \text{GDP}_3 = 5 \times (9) + 4 \times (8) + 4.5 \times (9) = \$117.5 \]

(b). Calculate the Real GDP for all three years. (3 marks)

\[ \text{Real GDP}_1 = 4.5 \times (10) + 3 \times (7) + 4.5 \times (3) = \$79.5 \]

\[ \text{Real GDP}_2 = \$99 = \text{Nominal GDP}_2 \]

\[ \text{Real GDP}_3 = 4.5 \times (9) + 3 \times (8) + 4.5 \times (9) = \$105 \]

(c). Calculate 2 nominal and 2 real growth rates. (4 marks)

\[ n.g.r._1 = \left( \frac{\text{GDP}_2 - \text{GDP}_1}{\text{GDP}_1} \right) \times 100\% = 25.32\% \]

\[ n.g.r._2 = \left( \frac{\text{GDP}_3 - \text{GDP}_2}{\text{GDP}_2} \right) \times 100\% = 16.69\% \]

\[ r.g.r._1 = \left( \frac{\text{Real GDP}_2 - \text{Real GDP}_1}{\text{Real GDP}_1} \right) \times 100\% = 24.52\% \]

\[ r.g.r._2 = \left( \frac{\text{Real GDP}_3 - \text{Real GDP}_2}{\text{Real GDP}_2} \right) \times 100\% = 6.06\% \]
(d). Calculate the GDP Deflators for all three years. (3 marks)

\[ \text{Deflator}_1 = \frac{\$ 74}{\$ 79.5} \times 100 = 93.7 \]

\[ \text{Deflator}_{3} = \frac{\$ 117.5}{\$ 105} \times 100 = 111.9 \]

(e). Calculate the CPI for all three years. (6 marks)

CPI basket includes: 11 A, 9 B, 5 C

\[ \text{CPI}_1 = \frac{5 \times (11) + 3 \times (9) + 4 \times (5)}{4.5 \times (11) + 3 \times (9) + 4.5 \times (5)} \times 100 = 98.99 \]

\[ \text{CPI}_2 = 100 \]

\[ \text{CPI}_{3} = \frac{5 \times (11) + 4 \times (9) + 4.5 \times (5)}{4.5 \times (11) + 3 \times (9) + 4.5 \times (5)} \times 100 = 114.65 \]

(e). For Year 2, calculate two inflation rates using the GDP deflator and the CPI. (4 marks)

\[ \pi_2 = \frac{100 - 99.37}{99.37} \times 100 \% = 0.63 \% \]

\[ \pi_{2} = \frac{100 - 98.99}{98.99} \times 100 \% = 1.02 \% \]
(g) Suppose Year 3 becomes the new base year. Recalculate the Real GDP and Deflators for all three years.

(6 marks)

\[
\begin{align*}
R\, GDP_1 &= 5(10) + 4(7) + 4.5(3) = \$71.5 \\
R\, GDP_2 &= 5(11) + 4(9) + 4.5(5) = \$113.5 \\
R\, GDP_3 &= N\, GDP_3 = \$117.5
\end{align*}
\]

\[
\begin{align*}
\text{Deflator}_1 &= \frac{\$779}{\$91.5} \times 100 = 86.34 \\
\text{Deflator}_2 &= \frac{\$99}{\$113.5} \times 100 = 87.22 \\
\text{Deflator}_3 &= 100
\end{align*}
\]

(h) After changing the base year, what happen to the values of the Real GDP and Deflators? What causes these values to be different? (4 marks)

(i) \(R\, GDP\) ↑; \(P_e\) in Yr 3 > \(P_e\) in Yr

due to Inflation

(ii) Deflator ↓; \(\xi\) denominators are bigger
due to (i) above
2. Loanable Funds Market: (26 marks)

(a). Find the demand equation \((Q_D = f(i))\). (4 marks)

\[
Q_D = a + \frac{\Delta Q_D}{\Delta i} i = a + \frac{i - 2}{6 - 8} i = a - 0.5 i
\]

\[
3 = a - 0.5(6) \implies a = 6
\]

\[
\therefore Q_D = 6 - 0.5 i
\]

(b). Find the supply equation \((Q_S = f(i))\). (4 marks)

\[
Q_S = c + \frac{\Delta Q_S}{\Delta i} i = c + \frac{3 - 2}{6 - 4} i = c + 0.5 i
\]

\[
3 = c + 0.5(6) \implies c = 0
\]

\[
\therefore Q_S = 0.5 i
\]
(c). Calculate the equilibrium interest rate and quantity of loanable fund. Must show your calculations. (4 marks)

\[ 6 - 0.5 \bar{c} = 0.5 \bar{c} \]

\[ \bar{c} = 6 \]

\[ Q = 3 \]

(d). Suppose the government wants to borrow $2 million to build a bridge. Calculate the new equilibrium interest rate and quantity of loanable fund. (6 marks)

\[ Q' = 8 - 0.5 \bar{c} \]

New \( Q_{\text{new}} \) : \[ 8 - 0.5 \bar{c} = 0.5 \bar{c} \]

\[ \bar{c} = 8 \]

\[ Q' = 4 \]

(e). Show the crowding out effect that results from the government's action in (d) in a diagram. Calculate the size of this effect? (8 marks)

![Diagram showing crowding out effect with labeled axes and arrows indicating changes in interest rate and quantity of loanable fund.](image)