1. Which panel in Figure 1 is most likely to depict the response to a significant increase in life expectancy?
   (a) i
   (b) ii
   (c) iii
2. Which panel in Figure 1 is most likely to depict the response of country experiencing a fall in the marginal productivity of capital?

(a) i
(b) ii
(c) iii
(d) iv

The next figure (Figure 2) depicts current account schedules for the US and the rest of the world (ROW). In the figure, the vertical axis measures the world interest rate. The current account surplus in the US is measured horizontally in the usual way. The current account surplus in ROW is measured horizontally also but, as done in class, with positive values in the westward direction and negative values eastward. The four panels of the figure, labeled (i) to (iv), represent how one of these schedules (dashed lines) may shift in response to shocks.

![Figure 2](image)

3. One often hears that the U.S. current account problem is due to a fall in the U.S. national savings rate. Which panel in Figure 2 depicts this case?

(a) i
(b) ii
(c) iii
(d) iv
4. If the argument described in the preceding question were correct, the fall in the U.S. savings rate would have led to:
   (a) An increase in the US current account surplus
   (b) An increase in the US current account deficit
   (c) An increase in ROW current account surplus
   (d) Both b and c.

5. If the argument discussed in the preceding two questions were correct, the world interest rate would have:
   (a) Increased
   (b) Fallen
   (c) Stayed the same
   (d) It would be impossible to tell on the basis of the theory.

The next figure (Figure 3) depicts possible configurations of a two period pure exchange small open economy (without production). In the figure, $r^*$ denotes the world interest rate. Assume that the representative household has no initial wealth.

![Figure 3](image)

6. Suppose that the representative household has an endowment of $Q_1$ in the first period and $Q_2$ in the second period. In Figure 3, the point B is the optimal consumption choice. The first period current account:
   (a) is a deficit equal to minus $Q_1$
   (b) is a deficit equal to $C_1$
   (c) is a surplus equal to $Q_1$
   (d) is a surplus equal to $Q_1$ minus $C_1$
7. In the setting of the previous question, what would not be an implication of the imposition of capital controls, in the form of a prohibition of international borrowing?
   (a) Domestic consumption would remain at B.
   (b) The current account would remain the same as without the controls
   (c) The interest rate would be given by the slope of the indifference curve going through A
   (d) Household welfare would be the same as without capital controls.

8. Consider Figure 3 again, but now assume that the typical household's endowment is given by A'. Which one of the following statements is true?
   (a) In the first period, the current account would be in surplus
   (b) Access to international capital markets reduces household welfare
   (c) With capital controls, in the form of a prohibition of international borrowing, household consumption would be given by A'
   (d) All of the above are false.

Figure 4, above, represents the equilibrium of a two period, small open economy with production and investment. In the figure, $Y(1)$ is the economy's endowment of goods in the first period. $K^*$ is the optimal amount of investment. There is one hundred percent depreciation of capital (i.e. $\delta = 1$). The thick solid line is the production possibility frontier. The slope of the dashed line (which goes through B) is $- (1+r^*)$, where $r^*$ is the world interest rate. Refer to this Figure for questions 9-11.
9. Which one of the following statements is false?
   (a) If the economy were closed to the rest of the world, production and consumption
       would be at P.
   (b) The slope of the PPF at B is equal to \(-(1+r^*)\).
   (c) In the last period, the economy produces more than it consumes.
   (d) In the first period the economy is a net lender to the rest of the world.

10. In Figure 4, the current account balance in period 1 is given by
    (a) \(C^*(1)\)
    (b) \(Y(1) - K^*\)
    (c) \(Y(1) - C^*(1) - K^*\)
    (d) \(C^*(1) + K^*\)

11. In Figure 4, a small increase in the world interest rate will lead to:
    (a) Higher investment
    (b) A larger CA deficit in the first period
    (c) Lower utility levels
    (d) All of the above

Questions 12-21 refer to the following two period model of a small open economy with a
single good each period. There is a representative household whose preferences are given
by the utility function:

\[ U(C(1),C(2)) = \log C(1) + \beta \log C(2) \]

where \(C(t)\) denotes consumption in period \(t = 1,2\), and \(\beta = 1/1.1\)

In period 1 the household receives an endowment of goods equal to \(Q(1) = 10\). In
period 2 the household receives profits, denoted by \(\Pi(2)\), from the firms it owns.
Households and firms have access to international financial markets where they can
borrow or lend at the constant interest rate of \(r^* = 0.1\) (ten percent) per period.

Both domestic households and firms have zero initial wealth in period 1. In period
2, firms can produce output (denoted by \(Q(2)\)) via the production function:

\[ Q(2) = F(K(2)) = 4.4 \sqrt{K(2)} \]

where \(K(2) = \) capital in period 2 = \(I(1) = \) investment in period 1.

Capital depreciates completely in production (i.e. \(\delta = 1\)). Since the typical firm
has zero initial wealth, it will borrow the funds it needs to finance investment. Hence
profits in period 2 must be:

\[ \Pi(2) = Q(2) - (1+r^*) I(1) \]

12. The firm optimal level of investment, \(I(1)\), must equal:
    (a) 4
(b) 5
(c) 6
(d) 7

(Hint: What is the condition for optimal investment? Also, note that the derivative of a square root is one half the inverse of the square root, i.e. if \( f(x) = \sqrt{x} \), \( f'(x) = 1/(2 \sqrt{x}) \). )

13. Second period profits, \( \Pi(2) \), must then equal:
   (a) 4.4
   (b) 8.8
   (c) 4
   (d) 2.2

14. The representative household's present value budget constraint can be written as:
   (a) \( C(1) + C(2) = 10 + \Pi(2) \)
   (b) \( C(1) + C(2) = 10 \)
   (c) \( C(1) + C(2) = \Pi(2) \)
   (d) \( C(1) + C(2)/(1.1) = 10 + \Pi(2)/1.1 \)

15. The representative household's optimal consumption choice satisfies:
   (a) \( C(1) = C(2) \)
   (b) \( C(1) = 2 C(2) \)
   (c) \( 2 C(1) = C(2) \)
   (d) \( C(1) = Q(1) \)

(Hint: What is the condition for optimal consumption? Also, recall that if \( f(x) = \log x \), then \( f'(x) = 1/x \).)

16. The representative household's consumption in period 1 approximately equals:
   (a) 14
   (b) 3.5
   (c) 7.3
   (d) 11.2

17. The trade balance in period 1 must then approximately equal:
   (a) A deficit of 1.3 units
   (b) A deficit of 8 units
   (c) A surplus of 2.5 units
   (d) A deficit of 5.2 units

(Hint: To answer the next four questions, 18-21, it is not necessary to solve questions 12-17. An increase in \( \beta \) means that households become more patient.)

18. If \( \beta \) increases, which of the following will occur? (Assume that the economy is small, so \( r^* \) is not affected by this change.)
   (a) Profits (\( \Pi(2) \)) will fall.
   (b) Investment (\( I(1) \)) will increase.
   (c) The household will increase savings in period 1
19. If $\beta$ increases, the trade balance in period 1 will
   (a) Increase
   (b) Decrease
   (c) Remain the same
   (d) One cannot tell with the information given

20. If $Q(1)$ increases, which of the following will occur? (Assume that the economy is small, so $r^*$ is not affected by this change.)
   (a) Profits ($\Pi(2)$) will fall.
   (b) Investment ($I(1))$ will increase.
   (c) The household will increase consumption and savings in period 1
   (d) All of the above

21. Which of the following statements is illustrated by the preceding three questions?
   (a) In a small open economy, the amount of investment does not depend on the preferences of domestic households.
   (b) In a small open economy, savings and investment depend on the same fundamental factors
   (c) In a small open economy, investment and profits depend on domestic savings
   (d) All of the above

22. The main difference between the current account balance and the trade balance is equal to:
   (a) Exports minus imports
   (b) Increases in foreign exchange reserves
   (c) Net income on foreign assets
   (d) There is no difference

23. In an open economy, private saving is equal to:
   (a) $I - CA + (G - T)$
   (b) $I + CA - (G - T)$
   (c) $I + CA + (G - T)$
   (d) $I - CA - (G - T)$

24. Every international transaction automatically enters the balance of payments:
   (a) Once, either as a debit or as a credit
   (b) Twice, once as a debit and once as a credit
   (c) Twice, both times as a debit
   (d) Once, as a credit

25. In 2006, the United States:
   (a) lent more than 5 percent of its GDP to the rest of the world, leading to a current account surplus
(b) borrowed between 5 percent and 10 percent of its GDP from the rest of the world, leading to a current account deficit
  (c) borrowed almost as much as it lent to the rest of the world, leading to current account balance
  (d) borrowed more than 10 percent of its GDP from the rest of the world

26. An American buys a car from Japan, paying with a check on an account with a New York bank. How does this transaction affect the U.S. balance of payments?
  (a) It only affects the current account, as an asset import
  (b) It only affects the current account, as an import from Japan
  (c) It affects both the current account and the financial account, as a goods import and an asset export
  (d) None of the above.

27. What is false of the components of the balance of payments?
  (a) The current account balance, the financial account balance, and the capital account balance add up to zero.
  (b) The current account balance is a measure of the change of net foreign wealth
  (c) Transactions that arise from exports and imports of goods and services are recorded in the trade account
  (d) The current account balance and the trade balance are always equal

Part II. (35%) The 2006 Economic Report of the President argued that one cause of the U.S. current account deficit is "rising crude oil prices (which) caused many oil-producing countries to become large net capital exporters. Middle Eastern countries had net capital inflows of $1 billion in 1995 and $103 billion of net outflows in 2004." Write a short essay discussing this argument using the tools you have learned in class. To get credit, you should draw appropriate investment, savings and current account schedules (similar to the ones in Figures 1 and 2) and describe how rising oil prices may have affected those schedules. Then you should derive the implications for world equilibrium. Are rising oil prices consistent with a wider U.S. current account deficit? What would higher oil prices imply for world interest rates? Is the Report's argument persuasive? Why or why not? What would be the implications for investment and savings, both in the U.S. and the rest of the world? Be as thorough as you can and justify your answers.

Please write your essay in the blue book provided.