ALL-RUSSIAN OLYMPIAD FOR STUDENTS AND GRADUATES

"MASTERS MAGIC. CONNECT SCIENCE AND PRACTICE!"

FIELD OF STUDY: "ECONOMY AND MANAGEMENT"

VARIANT 2

Task 1 (20 marks maximum)

Consider a closed economy with fixed prices and wages. Suppose the consumption function takes the form $C = 15 + 0.6(Y - T)$, where C is consumption, Y is income, and T is taxes. The investment function is $I = 65 - r$, where I is investment and r is the interest rate. The demand for money is given by $M / P = 4Y - 15r$, where M is the amount of money demanded and P is the price level. Assume that the price level is fixed at $P = 1$. Government spending is $G = 50$, and taxes are $T = 50$, and the money supply is $M = 850$.

Required:

(a) Derive the functions of IS and LM curve and find equilibrium Y^e and r^e. Find the levels of consumption C and investment I in equilibrium. (5 marks)

(b) Suppose that government spending increases by 50 to $G = 100$, with this extra spending financed by borrowing so there is no change in taxes or the money supply. Find new equilibrium level of output and interest rate. Find the new levels of consumption C and investment I in equilibrium. What is the deficit-financed government expenditure multiplier in this case? (5 marks)

(c) Now suppose that the same increase in government spending occurs, but this time it is financed by an increase in taxes so that the budget remains balanced. Compute the new equilibrium level of output and interest rate and hence the balanced-budget government expenditure multiplier. Find the levels of consumption C and investment I in equilibrium. (5 marks)

(d) Suppose instead that the extra spending is financed by the central bank printing money for the government (seigniorage). Compute the new equilibrium level of output and interest rate in this case and the associated government

expenditure multiplier. Find the levels of consumption C and investment I in equilibrium. (5 marks)

Task 2 (35 marks maximum)

The RLogic I-Tech corporation develops software for retailers. The corporation has two business divisions: development of the software for retailer logistics optimisation and IT consulting. Expected next year net profit equals $350 mln for the former and $280 mln for the latter. Yearly growth rates of the first division profits are assumed to be 7% while the second division profits remain constant. Free cash flow is discounted with rate of 12% for the first division and with 10% for the second. The corporation has $1300 mln of cash available and total debt is $1800 mln. There are 1500 mln shares in the free float.

Required:

(a) Find the price of the company shares (12 marks)

(b) The corporation decides to pay the retained profits to the shareholders and this is going to be made by shares buyout. The corporation plans to spend $1200 mln on shares buyout. How many shares will be bought out? What would the share price be after the buyout is made? (6 marks)

(c) How would the share price change if the corporation spends $800 mln on debt repayment and the remaining cash is distributed as dividends among shareholders? Find the share price before and after dividends are paid. (5 marks)

(d) The corporation is considering an opportunity of business expansion in a new direction – production of the self-service terminals. This requires $1200 mln of capital expenditure. The growth rate of the cash flow from the project is 9% per year and the first profit of $150 mln will be just next year. How would the share price change if the firm decides to invest cash in the project and leave the remaining cash on the firm's bank account? (7 marks)

(e) Which firm's choice described in (b)-(d) is the most beneficial for the shareholders? Justify.(5 marks)

Task 3 (45 marks maximum)

The professional football club is considering acquiring a highly successful international footballer. The transfer fee will be $50m, half of which is payable immediately and the other half payable in one year's time. His annual salary during his 5-year contract will be $15 million. At the end of his contract, the player will have no resale value to the club. The club's sponsor has agreed to increase the annual sponsorship fee from $4m to $17m, payable in advance. Annual income from gate money is expected to rise by $6m in year 1 and increase by 10% each year, thereafter. Merchandising income, from the sale of club shirts emblazoned with the player's name is expected to be $1m in year 1, rising by 5% each year.

The player has a poor injury record and the club will pay an initial insurance premium of 10% of the transfer fee, payable in advance to protect the club against the risk of his contract coming to an early end as a result of this problem. As a consequence of this transfer, the club will be able to loan two other players to an inferior team, thereby making annual salary savings of $9 million.

Assume that all transactions are in cash and arise at the end of the year concerned except where indicated above. The company's cost of capital is 12%.

Required:

(a) Calculate the Net Present Value (NPV) of this acquisition. (18 marks)

(b) Calculate the Accounting Rate of Return (ARR) using the average investment method and assuming the company uses the straight-line basis of depreciation. (9 marks)

(c) Advise the company's directors whether or not they should proceed with this acquisition, giving the reasons for your recommendation. (5 marks)

(d) What other facts should be taken into consideration in a decision of this nature? (5 marks)

(e) The company's financial advisor has suggested that instead of buying the player outright and in the two instalments referred to above, that instead, the player is acquired by the payment of 5 equal annual payments. At what annual cost payment would the club be indifferent between the original payment of $50 million in two instalments and

i. Four equal annual instalments, payable annually, the first instalment to be paid in one year? (4 marks)

ii. Four equal annual instalments, payable annually, the first instalment being paid immediately? (4 marks)