VARIANT 1.

TASK 1. (Approximately 20 -25 minutes)

(Total: 20 marks)

Consider a closed economy with fixed prices and wages. Suppose consumption function takes the form $C=150+0,8Yd$, Investments are $I=200$, Government purchases are $G = 350$, tax rate $t = 0,1$. There are no lump-sum taxes.

(a)   *Calculate equilibrium output and Budget Deficit. Plot the planned aggregate spending line and show the equilibrium output.* (**4 marks**)

(b)   *If the Government decides to balance the Budget by changing the tax rate, what new tax rate the Government need to implement?* (**4 marks**)

(c)   *Calculate the new equilibrium output after the change in the tax rate. Show how changes in the tax rate affect the planned aggregate spending line and new equilibrium output.* (**4 marks**)

(d)   *Compute the government spending multiplier before and after changes in tax rate. Explain why multiplier is changed?* (**4 marks**)

(e)   *If the potential output is 3000 and economy is in initial equilibrium (a) what changes in government purchases the Government need to implement in order to achieve potential output? Show how changes in government purchases affect the planned aggregate spending line and new equilibrium output.* (**4 marks**)

TASK 2. (Approximately 45 minutes)

(Total: 20 marks)

The Hotel is run by Alex and Kate. Alex is a trained landscape gardener who could earn $25,000 per annum if he worked part time but he prefers to help Kate run the hotel.
The profits from the hotel are shared equally between them.
The hotel has 40 rooms which are currently let at a daily rate of $60. The hotel is open for 7 days a week for 52 weeks a year. The business is very seasonal; the forecasts for the year ended 31 March 2023 are as follows:
Rooms occupied at full daily rate
April – September (26 weeks)   6500 rooms
October – March (26 weeks) 4500 rooms
The forecast costs for the year are:
Variable costs at $16 per room per day throughout the year
Fixed costs are the following

	April-September	October-March
	$	$
Reception and office staff	65,000	50,000
Maintenance	39,000	30,000

Depreciation	75,000	75,000
General running costs	23,600	18,600

Alex and Kate are concerned about what they think will be a weak economic climate and are considering a number of mutually exclusive options.

Option 1 - To reduce the room rate for the October-March period to $55 per day. This is expected to increase room occupancy by 10%.

Option 2 - To close the hotel in November and February. In these months no reception or office staff would be needed, maintenance and general running costs would be reduced by 50% but depreciation would remain unchanged. Assume occupancy is the same for each month in the six-month period.

Option 3 - Alex to work part time as a landscape gardener and in the hotel only at weekends. A full time hotel manager to be employed for $40,000 per annum. It is estimated that this manager would introduce efficiencies which would reduce variable costs by 10% and reception and office costs by 20%. The share of profits would be changed to Alex 30% and Kate 70%.

Required
(a) Calculate the room occupancy in days required to break even in each of the six-month periods based on original forecasts. **(3 marks)**
(b) Calculate and briefly comment on the profit for the year based on: **(11 marks)**
i. original forecasts
ii. option 1
iii. option 2
(c) Calculate and briefly comment on the income of Alex and Kate if Option 3 is implemented. **(6 marks)**

TASK 3 (IPO and issuance costs). (Approximately 40 minutes)

(Total: 25 marks)

The firm called "ATR Technologies" is considering an option of going public i.e. sell its shares through IPO. The value of assets in place is $45 bln and firm has no debt. Total number of shares is 900 mln and all these shares are held by the original owners. The firm has an investment project with NPV estimated as $25 bln and it requires initial investment of $30 bln.

(a) What is the fair share price of the firm before decision of investing in the project is made and prior to the IPO? How much wealth belongs to each of the original owners? **(3 marks)**

(b) The owners decided to issue new shares and sell them through IPO. The raised sum of money is expected to be spent on investment in the new project. Assume that there are no costs of IPO. **(8 marks)**

   i.   Denote the offering price by p^*. How many new shares should the ATR Technologies issue depending on the offering price? Give your answer as a function of p^*.

   ii.   What would be the equilibrium market price of the ATR Technologies shares after the offering? Give your answer as a function of p^*. Is this function decreasing or increasing?

(c) Now assume that there are costs of IPO which are 10% of the value of the shares offered. **(7 marks)**

   i.   How many new shares should the ATR Technologies issue depending on the offering price? Give your answer as a function of p^*.
   ii. What would be the equilibrium market price of the ATR Technologies shares after the offering? Give your answer as a function of p^*.
   iii. Explain the difference with your answer in (b).

(d) In this section assume that the offering price is such that there's underpricing of 20%. It means that the offering price is chosen at the level which is 80% of the equilibrium post-IPO market share price. Find the number of shares issued, offering price and the equilibrium market price. What is the share of equity which belongs to the original owners? How their wealth has changed? **(7 marks)**