

## 清华大学《经济学原理 2》期末考试

考试时间：北京时间 2022 年 6 月 19 日，19:00-21:00

### 注意事项：

1. 所有同学必须严格遵守学校考试规章制度，禁止携带小抄以及所有电子产品（包括计算器）；
2. 请在线考试的同学**实名（姓名-主/二机位）登录各自的腾讯会议并开启双摄像头**，并在腾讯会议签到；
3. 请在线考试的同学务必于北京时间 2022 年 6 月 19 日 21:15 之前在网络学堂提交作答内容，同时请不要外传试卷；
4. 请在线考试的同学全程录屏，并于北京时间 2022 年 6 月 20 日 19:00 之前在网络学堂提交录屏文件；
5. 请所有同学清晰简洁作答，线下考试的同学请在答题纸上清晰作答，在线考试的同学在网络学堂上传的答卷内容务必保证字迹清楚；
6. 在线考试的同学若有任何问题，可以在腾讯会议聊天框联系老师和助教；线下考试的同学若有任何问题，请举手示意助教；
7. 线上提前交卷的同学，在提交前请提醒助教；线下提前交卷的同学，请尽可能减少打搅其他同学；
8. 本次考试总分 100 分，考试时间 120 分钟，迟交或者作弊记作 0 分；
9. 请线下考试的同学戴好口罩，做好疫情防护；
10. 谢谢各位同学过去一个学期的辛勤付出！期末顺利，暑假快乐！

## 一、单项选择题（每题 1 分，30 道题，共 30 分）

1. 以下关于货币数量方程  $MV=PY$ ，说法正确的是（ ）。
  - A. 货币量  $M$  的变动必然引起名义产出  $PY$  的同比例变动
  - B. 如果真实产出  $Y$  不变，则通货膨胀率=货币增长率
  - C. 如果真实产出  $Y$  增加，则通货膨胀率<货币增长率
  - D. 以上说法都不正确
2. 认为货币供应量变动是通货膨胀主要原因的是（ ）。
  - A. 凯恩斯学派
  - B. 货币学派
  - C. 哈耶克
  - D. 古典学派
3. 在通货膨胀不能完全预期的情况下，通货膨胀将有利于（ ）。
  - A. 债务人
  - B. 债权人
  - C. 在职人员
  - D. 离退休人员
4. 以下关于经济波动的说法正确的是（ ）。
  - A. 经济波动是无规律的且不可预测的
  - B. 大多数宏观经济变量同时波动
  - C. 随着产量减少，失业增加
  - D. 以上说法都正确
5. 根据利率效应，总需求曲线向右下方倾斜是因为（ ）。
  - A. 物价水平下降降低了利率，鼓励更多用于投资品的支出，增加物品与服务的需求量
  - B. 物价水平下降提高了利率，鼓励更多用于投资品的支出，增加物品与服务的需求量
  - C. 物价水平下降降低了利率，鼓励更少用于投资品的支出，增加物品与服务的需求量
  - D. 物价水平下降降低了利率，鼓励更多用于投资品的支出，减少物品与服务的需求量
6. 当其他条件不变时，总需求曲线在（ ）。
  - A. 政府支出减少时会右移
  - B. 价格水平上升时会左移
  - C. 税收减少时会左移
  - D. 名义货币供给增加时会右移
7. 短期总供给曲线向右上方倾斜，是因为物价水平变动引起短期内的产量背离其长期水平，以下哪一种理论能用于这一解释？（ ）。
  - A. 黏性工资理论
  - B. 黏性价格理论
  - C. 错觉理论

D. 以上都是

8. “流动性陷阱”指的是当利率已经非常接近于零时，中央银行没有能力再降低利率。1998年时，日本的利率几乎为零，而经济仍然处在衰退之中。此时，你认为比较合理的刺激产出的政策是（ ）。

- A. 货币政策
- B. 财政政策
- C. 无所作为，因为两种政策都失效
- D. 财政-货币政策组合

9. 为减少经济中存在的失业，应采取的财政政策工具是（ ）。

- A. 增加政府支出
- B. 提高个人所得税
- C. 增加失业保险金
- D. 增加货币供给量

10. 边际消费倾向（MPC）降低（ ）。

- A. 提高了乘数的值
- B. 对乘数值无影响
- C. 降低了乘数的值
- D. 很难说有什么影响

11. 下列哪一种不属于央行影响货币供给的工具？（ ）。

- A. 公开市场操作
- B. 改变贴现率
- C. 调整存款准备金率
- D. 改变税率

12. 挤出效应是指（ ）。

- A. 扩张性财政政策使消费收入增加时引起总需求的额外变动
- B. 收入或消费的变动所引起的投资大幅度变动
- C. 一段时间内即使利率降到很低水平，市场参与者对其变化不敏感，对利率调整不再作出反应，导致货币政策失效
- D. 扩张性财政政策引起利率上升，从而减少了投资支出时所引起的总需求减少

13. 随着资本存量的增加，由增加的一单位资本生产的额外产量减少，称为（ ）

- A. 追赶效应
- B. 收益递减
- C. 边际收益
- D. 规模效益

14. 由于寻找工作需要时间的失业属于（ ）。

- A. 摩擦性失业
- B. 结构性失业

- C. 周期性失业
- D. 永久性失业

15. 部门转移会提高哪一种类型的失业？（ ）。

- A. 摩擦性失业
- B. 结构性失业
- C. 工会引起的失业
- D. 效率工资引起的失业

16. 本课程任课老师的姓名是（友情提示：请 uu 们三思而后行）：（ ）

- A. 钱颖一
- B. 钟笑寒
- C. 李明志
- D. 董 丰

17. 某摩托车生产企业某年：（1）购买了价值 100 万元的新设备；（2）新构建了一座价值 500 万元的厂房；（3）生产了价值 2000 万元的产品，其中 1500 万元产品已经销售，年底尚有 500 万元的产品库存。该企业当年创造的 GDP 值中的投资等于：（ ）

- A. 600 万元
- B. 2600 万元
- C. 1100 万元
- D. 2000 万元

18. 以下哪一项关于效率工资理论的表述是正确的？（ ）。

- A. 企业并不能选择它们是否支付效率工资，因为这些工资是由法律决定的
- B. 支付最低的可能工资总是最有效率的
- C. 支付高于竞争的均衡工资的工资会使工人不负责任
- D. 支付高于竞争的均衡工资的工资会改善工人的健康状况，减少工人流动率，提高工人的素质，并提高工人的努力程度

19. 中央银行最常用的货币政策工具（ ）。

- A. 法定存款准备金率
- B. 公开市场操作
- C. 再贴现率
- D. 道义劝告

20. 以下哪一个不是货币的职能？（ ）。

- A. 交换媒介
- B. 计价单位
- C. 价值储藏手段
- D. 防止通货膨胀

21. 如果法定准备金率是 40%，最完美情况下的货币乘数是（ ）。

- A. 0.4

- B. 40
- C. 2.5
- D. 60%

22. 如果利息税的税率是 40%，银行规定的 1 年期定期存款的利率是 5%，通货膨胀率是 2%，则该项存款的税前实际利率等于\_\_\_\_\_， 税后实际利率等于\_\_\_\_\_。

- A. 3%，1.8%
- B. 3%，1%
- C. 1.8%，1%
- D. 3%，3%

23. 一个国家长期的生活水平，主要由以下哪个因素决定：（ ）

- A. 低通胀；
- B. 政府规模的增长；
- C. 人口规模的增长；
- D. 技术进步。

24. 在经济周期期间，（ ）是 GDP 中波动最大的组成部分。

- A. 进口贸易
- B. 投资支出
- C. 消费支出
- D. 出口贸易

25. 高收入家庭的储蓄占其收入的比例（ ）低收入家庭的储蓄占其收入的比例。

- A. 不确定
- B. 高于
- C. 等于
- D. 低于

26. 长期菲利普斯曲线说明（ ）。

- A. 通胀与失业之间存在交替关系
- B. 传统的菲利普斯曲线仍有效
- C. 离原点越来越远
- D. 通胀与失业之间不存在交替关系

27. 按照（ ）观点，菲利普斯曲线所表示的通胀与失业率之间的替代关系是不存在的。

- A. 凯恩斯主义
- B. 理性预期学派
- C. 货币主义
- D. 供给学派

28. 国民储蓄包括（ ）。

- A. 居民储蓄和政府储蓄
- B. 私人储蓄和公共储蓄

- C. 居民储蓄和企业储蓄
- D. 企业储蓄和政府储蓄

29. 储蓄、投资和资本流动之间的关系是（ ）。

- A.  $S=I+NCO$
- B.  $S=I-NCO$
- C.  $S=I*NCO$
- D.  $S=I/NCO$

30. 真实汇率和名义汇率的关系是（ ）。

- A. 真实汇率=名义汇率 $\times$ 国内价格/国外价格
- B. 名义汇率=真实汇率 $\times$ 国内价格/国外价格
- C. 真实汇率=名义汇率+国外价格/国内价格
- D. 名义汇率=真实汇率+国外价格/国内价格

**二、判断题（对于每道题的陈述，请标出“对”（T）或者“错”（F）；无论对错，不用解释；每题 1 分，20 道题，共 20 分）**

1. CPI 包括进口照相机价格上升，但 GDP 平减指数不包括。
2. 当华为买了 IBM 的股票时，中国的资本净流出就增加了。
3. 一杯星巴克咖啡在泰国卖 125 泰铢，在中国卖 35 元，人民币和泰铢的汇率是 1:5，如果没有运输成本等费用，那么有套利机会。
4. 贸易赤字和财政赤字不可能同时发生。
5. 购买力平价的基本逻辑是一价定律。
6. 真实利率不可能是负的。
7. 如果生产函数表现出规模收益不变，那么所有投入翻一番、产量也翻一番。
8. 储蓄和投资率的增加可以长期地提高一国的增长率。
9. 假设在一个封闭的经济体中，某公司生产的汽车多卖掉一些比少卖掉一些时，该国的 GDP 增加要多一些。
10.  $CPI = \text{名义 GDP} \times 100 / \text{真实 GDP}$ 。
11. 货币政策主要发力于短期，财政政策则主要关注长期。
12. 一个家庭买了一套新公寓。此项购买将作为耐用消费品计入 GDP。

13. CPI 包括进口食品价格上升，但 GDP 平减指数不包括。
14. 失业率下降，一定意味着劳动力市场的改善。
15. 根据费雪方程 (Fisher Equation)，实际利率 = 名义利率 - 通货膨胀率。
16. 奥肯定律 (Okun's Law) 是说，通胀率和失业率之间在短期存在负相关关系。
17. 费雪效应表明在长期中，如果通货膨胀率从 5% 上升到 7%，那么名义利率应该提高 2%，而真实利率将保持不变。
18. 资本商品不包含在 CPI 内，但包含在 GDP 平减指数内 (如果是在国外生产)。
19. 一个国家的储蓄越高，老百姓的整体福利越高。
20. 从短期看，总需求增加提高了物价，降低了产量，增加了失业。

### 三、计算题/证明题 (共 50 分):

1. (46 分) 在封闭经济里，假设消费函数  $C = \alpha + \beta * (Y - T)$ ，其中  $Y$  和  $T$  分别是总收入和税收。另外， $I$  和  $G$  分别表示投资和政府支出，其中  $\alpha > 0, 1 > \beta > 0$ 。
  - (1) 请把均衡产出  $Y$  表示成  $I$ 、 $G$ 、 $T$  的函数; (1 分)
  - (2) 如果政府支出  $G$  增加一单位， $Y$  增加多少，以及对应的经济学直觉是? 如果税收  $T$  减少一单位， $Y$  增加多少，以及对应的经济学直觉是? (4 分)
  - (3) 假设投资函数  $I = a - b * r$ ，其中  $r$  是实际利率， $a, b > 0$ 。如果利率下降一单位， $Y$  增加多少，以及对应的经济学直觉是? (2 分)
  - (4) 假设投资函数  $I = a - b * r$ ，且消费函数  $C = \alpha + \beta * (Y - T)$ ，假定  $T$  很小，请推导实际利率  $r$  和均衡产出  $Y$  之间的关系，并作图展示 (横轴为  $Y$ ，纵轴为  $r$ ) (友情提示: 这条线叫做 IS 曲线)? (4 分)
  - (5) 假设货币需求函数  $\frac{M^D}{P} = \theta * (-\eta * r + \lambda * Y)$ ，其中  $r$  是实际利率， $\theta, \eta, \lambda > 0$ 。均衡时，即  $M^D = M^S = M$ ，如果给定货币供给  $M$ ，请推导实际利率  $r$  和均衡产出  $Y$  之间的关系，并作图展示 (横轴为  $Y$ ，纵轴为  $r$ ) (友情提示: 这条线叫做 LM 曲线)? (4 分)
  - (6) 将上面的 IS 和 LM 曲线联立起来:
    - ① 如果担心经济衰退 ( $Y$  下降)，家户的边际消费倾向可能会降低，那么一般而言  $\beta$  变高还是变低，请用图展示哪条曲线将如何移动，以及均衡产出  $Y$  如何变化，同时阐述背后的经济学原理 (4 分)?
    - ② 如果担心经济衰退 ( $Y$  下降)，家户对于流动性的需求上升，那么一般而言  $\theta$  变高还

是变低？请用图展示哪条曲线将如何移动，以及均衡产出 $Y$ 如何变化，同时阐述背后的经济学原理？（4分）

- ③ 如果名义利率 $i$ 存在零利率下限（zero lower bound, ZLB），即 $i \geq 0$ ，那么给定通货膨胀 $\pi$ ，LM 曲线的纵轴 $r$ 的下限是多少？如果考虑 ZLB 进而考虑纵轴 $r$ 的下限，那么请重新画 LM 曲线（假定此时下限比之前 LM 曲线在  $Y=0$  时  $r$  的取值更高）。（4分）
- ④ 根据上一问推导出的新的 LM 曲线：如果 IS 和 LM 交点恰好处于 $r$ 的下限值，这体现了哪个重要的宏观经济学术语？此时，扩张性的货币政策将如何影响 LM 或者 IS 曲线，以及如何影响均衡产出？此时如果换做扩张性的财政政策，是 IS 还是 LM 曲线会移动，以及如何影响均衡产出？请简要阐述这一问一系列结果背后的经济学直觉。（7分）

（7）请推导出总需求曲线，并且画图来展示（横轴为 $Y$ ）（提示：可综合第（4）和第（5）问的分析）？如果政府支出 $G$ 增加一单位，总需求曲线移动多少单位？和第（2）问相比，有何不同？为何不同？（6分）

（8）假设总供给曲线为 $Y^S = \bar{Y} + \rho * (P - P^E)$ ，其中 $\bar{Y}$ 是潜在产出， $P^E$ 是家户对于物价水平的预期。给定总需求曲线不动，请画图展示负面总供给冲击（比如石油价格高企）对于物价水平和总产出的短期以及中长期影响，并做简要的文字说明？（提示： $P^E$ 在中长期可能会逐步变化）。（6分）

2. （4分）如果央行的法定存款准备金率为 $R$ ，

（1）请推导出课上展示的完美情况下的货币创造乘数（multiplier）；（2分）

（2）推导上面这个乘数的时候，如课上所强调，我们用了两个重要假设，请简要阐述这两个假设。（2分）



**1、 Single choice questions (1 point for each question, 30 questions in total)**

1. Which statement about the monetary quantity equation  $MV=PY$  is correct ( ).
  - A. The change of monetary quantity  $M$  will inevitably cause the same proportion change of nominal output  $PY$
  - B. If the real output  $Y$  is constant, then inflation rate = monetary growth rate
  - C. If the real output  $Y$  increases, then the inflation rate < the monetary growth rate
  - D. None of the above statements is correct
2. Which of the following school believes that the change of money supply is the main cause of inflation. ( ).
  - A. Keynesian School
  - B. Monetarist school
  - C. Hayek
  - D. Classical school
3. If inflation cannot be fully expected, inflation will benefit ( ).
  - A. Debtors
  - B. Creditors
  - C. In service personnel
  - D. Retirees
4. Which of the following statement about economic fluctuation is correct ( ).
  - A. Economic fluctuations are irregular and unpredictable
  - B. Most macroeconomic variables fluctuate simultaneously
  - C. Unemployment increases as output decreases
  - D. All the above statements are correct
5. According to the interest rate effect, the downward slope of the aggregate demand curve is due to ( ).
  - A. Falling prices have lowered interest rates, encouraged more spending on investment goods and increased demand for goods and services
  - B. Falling prices have raised interest rates, encouraged more spending on investment goods and increased demand for goods and services
  - C. Falling prices have lowered interest rates, encouraged less spending on investment goods and increased demand for goods and services
  - D. Falling prices have lowered interest rates, encouraged more spending on investment goods and reduced the demand for goods and services
6. When other conditions remain unchanged, the total demand curve ( ).
  - A. Shifts right when government spending decreases

- B. Moves to the left when the price level rises
- C. Shifts left when tax decreases
- D. Shifts right when the nominal money supply increases

7. The short-term aggregate supply curve inclines to the upper right because the short-term output deviates from its long-term level due to the change of price level. Which of the following theories can be used to explain this? (     )

- A. Sticky wage theory
- B. Sticky price theory
- C. Illusion theory
- D. All of the above

8. "liquidity trap" refers to the inability of the central bank to lower interest rates when interest rates are very close to zero. In 1998, interest rates in Japan were almost zero and the economy was still in recession. At this point, the more reasonable policy to stimulate output is (     ).

- A. Monetary policy
- B. Fiscal policy
- C. Do nothing because both policies fail
- D. Fiscal policy and monetary policy

9. In order to reduce unemployment in the economy, the fiscal policy tool that should be adopted is (     ).

- A. Increasing government expenditure
- B. Raising personal income tax
- C. Increasing unemployment insurance benefits
- D. Increasing money supply

10. Decreasing marginal propensity to consume (MPC) will (     ).

- A. Increase multiplier value
- B. Have no effect on multiplier value
- C. Reduce multiplier value
- D. It's hard to say what the impact is

11. Which of the following is not a central bank's tool for influencing money supply? (     )

- A. Open market operations
- B. Change discount rate
- C. Adjust deposit reserve ratio
- D. Change tax rate

12. Crowd out effect refers to (     ).

- A. When the expansionary fiscal policy increases the consumption income, it will cause additional changes in aggregate demand

- B. Substantial changes in investment caused by changes in income or consumption
- C. Even if the interest rate drops to a very low level for a period of time, market participants are not sensitive to its changes and will no longer respond to the interest rate adjustment, leading to the invalidation of monetary policy
- D. The expansionary fiscal policy causes the interest rate to rise, thus reducing the total demand caused by investment expenditure

13. As the capital stock increases, the additional output produced by the increased unit of capital decreases, which is called ( )

- A. Catch up effect
- B. Diminishing returns
- C. Marginal income
- D. Economies of scale

14. Unemployment due to the time it takes to find a job belongs to ( ).

- A. Frictional unemployment
- B. Structural unemployment
- C. Cyclical unemployment
- D. Permanent unemployment

15. Which type of unemployment will be increased by sector transfer? ( ).

- A. Frictional unemployment
- B. Structural unemployment
- C. Union induced unemployment
- D. Unemployment caused by efficiency wage

16. The name of the teacher of this course is (friendly note: look before you leap): ( )

- A. Qian Yingyi
- B. Zhong Xiaohan
- C. Li Mingzhi
- D. Dong Feng

17. A motorcycle manufacturer: (1) purchased new equipment worth 1 million yuan; (2) A new factory worth 5 million yuan has been built; (3) The company has produced 20 million yuan worth of products, of which 15 million yuan has been sold, and there is still 5 million yuan of product inventory at the end of the year. The investment in the GDP value created by the enterprise in the current year is equal to: ( )

- A. 6 million yuan
- B. 26 million yuan
- C. 11 million yuan
- D. 20 million yuan

18. Which of the following statements about the efficiency wage theory is correct?  
( )

- A. Enterprises cannot choose whether they pay efficiency wages or not, because these wages are determined by law
- B. It is always most efficient to pay the lowest possible wage
- C. Paying a wage higher than the competitive equilibrium wage would make workers irresponsible
- D. Paying a wage that is higher than the competitive equilibrium wage will improve the health status of workers, reduce the turnover rate of workers, improve the quality of workers, and improve the degree of efforts of workers

19. The most commonly used monetary policy tool of the central bank ( ).

- A. Statutory deposit reserve ratio
- B. Open market operations
- C. Rediscount rate
- D. Moral advice

20. Which of the following is not a function of money? ( )

- A. Exchange medium
- B. Pricing unit
- C. Store of value
- D. Prevent inflation

21. If the statutory reserve ratio is 40%, the monetary multiplier in the most perfect case is ( )

- A. 0.4
- B. 40
- C. 2.5
- D. 60%

22. If the tax rate of interest tax is 40%, the interest rate of one-year fixed deposit stipulated by the bank is 5% and the inflation rate is 2%, the effective interest rate before tax of the deposit is equal to ( ) and after tax is equal to ( ).

- A. 3%, 1.8%
- B. 3%, 1%
- C. 1.8%, 1%
- D. 3%, 3%

23. The long-term living standard of a country is mainly determined by which of the following factors: ( )

- A. Low inflation;
- B. The growth of government scale;
- C. Population growth;

D. Technological progress.

24. During the economic cycle, ( ) is the most volatile component of GDP.

- A. Import trade
- B. Investment expenditure
- C. Consumption expenditure
- D. Export trade

25. The proportion of savings of high-income households in their income is ( ) the proportion of savings of low-income households in their income.

- A. Uncertain
- B. Above
- C. Equal to
- D. Below

26. The long-term Phillips curve illustrates( ).

- A. There is an substitution relationship between inflation and unemployment
- B. The traditional Phillips curve is still valid
- C. Farther and farther from the origin
- D. There is no substitution relationship between inflation and unemployment

27. According to ( ), the substitution relationship between inflation and unemployment represented by Phillips curve does not exist.

- A. Keynesianism
- B. Rational Expectation economics
- C. Monetarism
- D. Supply-side economics

28. National savings include ( ).

- A. Household savings and government savings
- B. Private savings and public savings
- C. Resident savings and enterprise savings
- D. Enterprise savings and government savings

29. The relationship between savings, investment and capital flows is ( ).

- A.  $S = I + NCO$
- B.  $S = I - NCO$
- C.  $S = I * NCO$
- D.  $S = I / NCO$

30. The relationship between real exchange rate and nominal exchange rate is ( ).

- A. Real exchange rate = nominal exchange rate  $\times$  Domestic price / foreign price
- B. Nominal exchange rate = real exchange rate  $\times$  Domestic price / foreign price

- C.  $\text{Real exchange rate} = \text{nominal exchange rate} + \text{foreign price} / \text{domestic price}$   
D.  $\text{Nominal exchange rate} = \text{real exchange rate} + \text{foreign price} / \text{domestic price}$

2、 True or false questions (for the statement of each question, please mark "ture" (T) or "false" (f);No matter true or false, there is no need to explain; 1 point for each question, 20 questions in total)

- 1.CPI includes the rise in the price of imported cameras, but the GDP deflator does not.
- 2.When Huawei bought IBM shares, China's net capital outflow increased.
- 3.A cup of Starbucks coffee costs 125 baht in Thailand and 35 yuan in China. The exchange rate between RMB and baht is 1:5. If there are no transportation costs and other expenses, there is an opportunity for arbitrage.
- 4.Trade deficit and fiscal deficit cannot occur at the same time.
- 5.The basic logic of purchasing power parity is the one price law.
- 6.Real interest rates cannot be negative.
- 7.If the production function shows that the constant returns to scale, then all inputs doubles and the output will also double.
- 8.The increase of savings and investment rate can improve a country's growth rate in the long run.
- 9.Suppose that in a closed economy, when a company sells more cars, the country's GDP will increase more.
10. $\text{CPI} = \text{nominal GDP} * 100 / \text{real GDP}$ .
11. Monetary policy mainly focuses on the short term, while fiscal policy mainly focuses on the long term.
12. A family bought a new apartment. This purchase will be included in GDP as durable consumption.
13. CPI includes the rise in the price of imported food, but the GDP deflator does not.
14. The decline in unemployment must mean an improvement in the labor market.

15. According to Fisher Equation, real interest rate = nominal interest rate - inflation rate.
16. Okun's law says that there is a negative correlation between inflation rate and unemployment rate in the short term.
17. The fisher effect shows that in the long run, if the inflation rate rises from 5% to 7%, the nominal interest rate should increase by 2%, while the real interest rate will remain unchanged.
18. Capital goods are not included in the CPI, but in the GDP deflator (if produced abroad).
19. The higher the savings of a country, the higher the overall welfare of the people.
20. In the short run, the increase in aggregate demand has raised prices, reduced output and increased unemployment.

### 3、 Calculation question / proof question (50 points in total):

1. (46 points) In a closed economy, the consumption function is  $C = \alpha + \beta * (Y - T)$ , where  $Y$  and  $T$  are total income and tax respectively. In addition,  $I$  and  $G$  respectively represent investment and government expenditure, where  $\alpha > 0, 1 > \beta > 0$ 
  - (1) Please express the balanced output  $Y$  as a function of  $I, G, T$ ; (1 point)
  - (2) If the government expenditure  $G$  increases by one unit, how much will  $Y$  increase, and what is the corresponding economic intuition? If the tax revenue  $T$  reduces by one unit, how much will  $Y$  increase, and what is the corresponding economic intuition? (4 points)
  - (3) Assume the investment function is  $I = a - b * r$ , where  $r$  is the real interest rate,  $a, b > 0$ . If the interest rate drops by one unit, how much does  $Y$  increase, and what is the corresponding economic intuition? (2 points)
  - (4) Assume the investment function is  $I = a - b * r$  and the consumption function is  $C = \alpha + \beta * (Y - T)$ , suppose  $T$  is small, please deduce the relationship between the real interest rate  $r$  and the equilibrium output  $Y$  and draw a graph. (horizontal axis is  $Y$  and vertical axis is  $r$ ) (friendly note: this line is called the IS curve) (4 points)
  - (5) Suppose the money demand function is  $\frac{M^D}{P} = \theta * (-\eta * r + \lambda * Y)$ , where  $r$  is the

real interest rate,  $\theta, \eta, \lambda > 0$ . In equilibrium, that is  $M^D = M^S = M$ , if the money supply is given, please deduce the relationship between the real interest rate  $r$  and the equilibrium output  $Y$ , and draw a graph (the horizontal axis is  $Y$ , and the vertical axis is  $r$ ) (friendly note: this line is called LM Curve)? (4 points)

(6) Combine the above IS and LM curves:

① If you are worried about economic recession ( $Y$  decline), the marginal propensity to consume of households may decrease. Generally speaking, will  $\beta$  become higher or lower? Please use a graph to show which curve will move and how the equilibrium output  $Y$  will change, and explain the underlying economic principles (4 points)?

② If you are worried about the economic recession ( $Y$  decline), households' liquidity increases, will  $\theta$  generally become higher or lower? Please use a graph to show which curve will move and how the equilibrium output  $Y$  will change, and explain the economic principles behind it? (4 points)

③ If there is a zero lower bound (ZLB) for the nominal interest rate, that is  $i \geq 0$ , given inflation  $\pi$ , what is the lower bound of the vertical axis  $r$  of the LM Curve? If ZLB is considered and the lower limit of the vertical axis  $r$  is considered, please redraw the LM Curve (suppose the lower limit is higher than  $r$  at  $Y=0$  in the previous LM curve)? (4 points)

④ According to the new LM Curve derived from the previous question: if the intersection of IS and LM is just at the lower bound of  $r$ , which important macroeconomic term does this imply? how will expansionary monetary policy affect LM or IS curve, and how will it affect equilibrium output? At this point, if we implement expansionary fiscal policy, will the IS or LM Curve move, and how will it affect the balanced output? Please briefly explain the economic intuition behind this series of results. (7 points)

(7) Please derive the total demand curve and draw a graph to show. (the horizontal axis is  $Y$ ) (hint: the analysis of questions (4) and (5) can be integrated) If government expenditure  $G$  increases by one unit, how many units will the aggregate demand curve move? How is it different from the result of question (2)? Why is it different? (6 points)

(8) Suppose the total supply curve is  $Y^S = \bar{Y} + \rho * (P - P^E)$ , where  $\bar{Y}$  is the potential output,  $P^E$  is the household expectation for the price level. Given the fixed aggregate demand curve, please draw a graph to show the short-run and long-run impact of negative aggregate supply shocks (such as high oil prices) on the price level and total output, and give a brief description. (Note:  $P^E$  may change



gradually in the long term). (6 points)

2. (4 points) if the legal deposit reserve ratio of the central bank is  $R$ .

(1) Please derive the money creation multiplier in the perfect case shown in class; (2 points)

(2) When deriving the above multiplier, as emphasized in the class, we used two important assumptions. Please briefly explain these two assumptions. (2 points)