

Part I: Answer the following questions (1) to (10). Each answer accounts for 5 points.

1. Wiggins has a utility function $\min\{z, m\}$, where z is his consumption of basketballs and m is money left for other stuff. He has a budget of \$12 and was paying a price of \$4 for a ball. If the price of basketball went up to \$6, find Wiggins' (1) compensation variation, (2) equivalence variation, and (3) the *change* of consumer surplus of this price change.
2. LaVine has a wealth of \$81 and is an expected utility maximizer with utility function x^2 . He owns a lottery which offers a payoff of \$36 with probability $\frac{2}{3}$ and a payoff \$4 with probability $\frac{1}{3}$. Find LaVine's (4) certainty equivalence, (5) risk premium, and (6) probability premium.
3. You are selling two goods, 1 and 2, to a market consisting of three consumers with reservation prices as listed in the following table. The unit cost of each product is \$30. Find (7) the optimal prices and profits for selling the goods separately and (8) the optimal prices and profits for selling the goods altogether as a bundle.

Reservation price(\$)		
Consumer	Good 1	Good 2
A	20	100
B	60	60
C	100	20

4. Consider a battle of sexes game that husband and wife decide what to do on their anniversary. The wife first chooses between stay at home and attend a concert. If she chose to stay home, the game ends. If she decides to attend a concert, then she and her husband independently choose which concert to go, not knowing the other person's choice. Sadly, there are only two concerts available, H and W, and the husband prefers H while the wife prefers W. The best outcome for the husband is to attend the H concert with his wife. If his wife forces him to go to the W concert with her, he'd rather stay home. However, the worst scenario to him is to attend any concert alone. The same reasoning applies to the wife, but the best scenario to her is to go to the W concert with her husband, and she also prefers to stay home than going to the H concert with her husband. The worst case is the same as her husband's preference. (9) Find the Nash equilibria of this game and (10) the subgame perfect equilibria of this game.

PART II:

1 Suppose labor market is a competitive market.

- (1) Use a diagram of supply and demand curves to explain why the market equilibrium wage (W) cannot exceed the value of marginal product (VMP) of a unit of labor. (5 points)
- (2) Use your diagram from (1), explain why artificially lifting wages cause deadweight loss for the society? (5 points)

2 Education can create either positive or negative externality for society. Regard universities as the suppliers and students as demanders for education. Let us define fake education as the situation where students pay tuition and enroll classes but do not actually learn the subjects provided by the classes.

- (1) Use a diagram of supply and demand curves to explain why fake education generates deadweight loss for society. (5 points)
- (2) Following from (1), use a diagram of supply and demand curves to explain why government subsidy for fake education creates even more serious deadweight loss for society. (10 points)

3 People live together in society. Whenever two persons encounter each of them can choose to carry out his duty honestly (H) or cheat (C). Each encountering pair engage a two-person prisoner-dilemma game.

- (1) Suppose the set of all of their action profiles is $A = \{(H, C), (H, H), (C, H), (C, C)\}$ and the corresponding payoff profiles are the elements of the set $U = \{(-1, 4), (3, 3), (4, -1), (1, 1)\}$. Find the Nash equilibrium of the game. (10 points)

(2) Following from (1), now suppose there exist law enforcers in the society. Hence, each encounter involves three player. The law enforcer can be honest (H) or cheat (C) as well. Suppose the set of all of their action profiles is

$$A = \{(H, C, H), (H, H, H), (C, H, H), (C, C, H), (H, C, C), (H, H, C), (C, H, C), (C, C, C)\}$$

and the corresponding payoff profiles are the elements of the set

$$U = \{(2, 0, 3), (3, 3, 3), (0, 2, 3), (0, 0, 3), (-2, 0, 5), (1, 1, 5), (0, -2, 5), (-1, -1, -1)\}.$$

Find the Nash equilibria of the game. (15 points)

Please answer the following problems.

1. Write down the definition for the following statements:

- (1) The limit of a real-valued function $f(x)$ defined on \mathbb{R} is y as x approaches a . (10 pts.)
- (2) A real-valued function $f(x)$ defined on \mathbb{R} is continuous at a point $x = a$. (10 pts.)
- (3) A real-valued function $f(x)$ defined on \mathbb{R} is differentiable at a point $x = a$. (10 pts.)

2. Determine whether the series $\sum_{n=1}^{\infty} (-1)^n \left(e^{\frac{1}{n}} - 1 \right)$ is convergent or divergent. (5 pts.)

3. Find the following limits:

(1) (5 pts.)

$$\lim_{x \rightarrow 0^+} \frac{x - \ln(1+x)}{x^2}.$$

(2) (5 pts.)

$$\lim_{x \rightarrow 0} \frac{2^{\sin x} - 1}{e^x - 1}.$$

4. Evaluate $\lim_{x \rightarrow \infty} (5^x + 6^x + 9^x)^{\frac{1}{x}}$ (5 pts.)

5. Let $f: \mathbb{R}_{++} \rightarrow \mathbb{R}$ with

$$f(x) = \int_{\frac{1}{x}}^x \frac{x}{t} dt.$$

Find $f'(x)$. (8 pts.)

6. Suppose that $\frac{x^3}{3} + 2xy + y^2 = 2$. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$. (8 pts.)

7. Evaluate the following integrals:

(1) $\int_e^{e^2} \frac{1}{x \ln x} dx$. (8 pts.)

(2) $\int_0^{\infty} x^2 e^{-x} dx$. (8 pts.)

(3) $\int_{-\infty}^{\infty} e^{ty} \left(\frac{1}{\sqrt{2\pi}} e^{-\frac{y^2}{2}} \right) dy$. (5 pts.)

8. Find the Taylor approximation of order TWO of the following functions at the corresponding points:

(1) $f(x) = -e^{-x}$ at $x = 0$. (8 pts.)

(2) $F(x, y) = x^{\frac{1}{3}} y^{\frac{2}{3}}$ at $(x, y) = (1, 1)$. (5 pts.)



注意：本試卷有兩部份，Part I 有 20 題單選題，Part II 有二大題計算填充題。請考生答題前，務必閱讀每一部分的注意事項。

Part I：單選題（每題 3 分，共 60 分）

注意事項：依照題號順序，將答案寫在答案卷第一頁選擇題作答區對應題號空格內（第 1~20 格）。每格

答對得 3 分，答錯或未作答 0 分。

1. Keynes assumed that wages and prices were slow to adjust in order to explain
 - (A) high inflation.
 - (B) the high level of interest rates.
 - (C) why inflation fell in recessions.
 - (D) persistently high unemployment.
2. The HTA company sells cellphones, using component parts it buys from another firms for \$200. It pays its workers \$350, pays \$10 in taxes, and has profits of \$30. What is its value added?
 - (A) 30.
 - (B) 590.
 - (C) 390.
 - (D) 190.
3. In a country with zero inflation, if the nominal interest rate is equal to 0.05, the consumer in this country can trade off one unit of current consumption for _____ units of future consumption.
 - (A) 1.05.
 - (B) 0.95.
 - (C) 0.05.
 - (D) -0.05.
4. Due to diminishing marginal productivity,
 - (A) the curve of labor supply is not vertical.
 - (B) the marginal propensity to consume is less than 1.
 - (C) the curve of labor demand slopes downward.
 - (D) nominal wages are sticky in a downward direction.
5. According to Friedman's Permanent Income Hypothesis, when there is an increase in real interest rate by 10%, what is likely to happen to current consumption and saving?
 - (A) Current consumption decreases and saving increases.
 - (B) Current consumption increases and saving decreases.
 - (C) No change in current consumption or saving.
 - (D) Current consumption increases and saving increases.
6. If all international factor payment flows are investment income, then net investment income from abroad equals
 - (A) net exports.
 - (B) the current account balance.

- (C) the trade balance.
(D) net factor payments from abroad.
7. In order to satisfy the medium-of-exchange function of money, it has to be
(A) issued by a central bank.
(B) backed by gold.
(C) widely accepted as a method of payment.
(D) an inherently valuable commodity.
8. How are interest rates related to the business cycle?
(A) Real interest rates are acyclical, while nominal interest rates are procyclical.
(B) Both nominal and real interest rates are procyclical.
(C) Real interest rates are countercyclical, while nominal interest rates are procyclical..
(D) Both nominal and real interest rates are acyclical.
9. Suppose the central bank imposes the minimum-balance requirement for free checking on checking accounts by \$100. Then you take \$100 out of your certificates of deposit account and put it in your checking account. What is the overall effect on M1 and M2?
(A) M1 rises by \$100, M2 reduces by \$100.
(B) M1 rises by \$100, M2 is unchanged.
(C) M1 is unchanged, M2 is unchanged.
(D) M1 is unchanged, M2 reduces by \$100.
10. Suppose that the economy's production function is $Y_t = A_t K_t^{0.3} L_t^{0.7}$, where Y_t is output, A_t is total factor productivity, K_t is capital, L_t is labor. If the productivity grows 1%, capital grows 2%, and labor grows 2%, how much does output grow?
(A) 1%.
(B) 2%.
(C) 3%.
(D) 4%.
11. 以下何者最可能造成一國貨幣實質升值？
(A) 該國貨幣升值。
(B) 該國物價下跌。
(C) 該國消費者更喜歡購買進口品。
(D) 以上皆有可能。
12. 台北某外商銀行不斷放話說台幣即將貶值，由於很多投資人都相信，新台幣也因此有貶值的壓力。而中央銀行宣誓它絕對會穩定匯率，請問此時央行最可能如何行動？
(A) 在外匯市場上大量買進美金。
(B) 提高美元存款的利率。
(C) 提高新台幣的存款準備率。
(D) 拋售外匯存底。
13. 請問下列何者不構成外匯市場上外匯的供給？
(A) 二郎將選舉結餘經費 1 億新台幣換成英鎊匯入小兒子在英國的帳戶。

- (B) 三妹長期在中國工作，今年農曆過年回台灣團聚，攜回 5 千人民幣發壓歲錢。
(C) 四郎為台灣人，在法國工作的期間也投資台灣股市，他以薪水中的 2 千歐元投資於心目中具有潛力的台灣上市公司。
(D) 五妹為美商麥當勞的經理，日前收到美國匯來的 100 萬元營運資金。
14. 根據跨國研究，下列何者與一國之高經濟成長較無關？
(A) 豐富的天然資源。
(B) 教育程度高的勞動力。
(C) 較高的儲蓄率。
(D) 開放的貿易政策與國際投資。
15. 一個國家的經濟成長率一直維持每年 4% 時，它大概多久能將其產出變成二倍？
(A) 5 年以內。
(B) 6~10 年。
(C) 11~20 年。
(D) 21 年以上才可能。
16. 在台灣，當人們將定期存款轉為活期儲蓄存款時，
(A) M1A 增加。
(B) M1B 增加。
(C) M2 減少。
(D) 以上皆是。
17. 「貨幣中立性 (monetary neutrality)」是指
(A) 貨幣面變動不會影響任何變數。
(B) 貨幣面變動不會影響名目變數。
(C) 貨幣面變動不會影響實質變數。
(D) 以上皆是。
18. 在其他條件不變下，當中央銀行在公開市場買進債券時，
(A) 短期均衡所得會減少。
(B) 長期均衡所得不變。
(C) 短期均衡物價會下跌。
(D) 以上皆對。
19. 依照總合供需模型，廠商投資提高會使該經濟體系產出增加，其原因為：
(A) 廠商投資提高使資本累積，總合供給曲線因而右移所致。
(B) 廠商投資提高使體系貨幣變多，總合需求曲線因而右移所致。
(C) 廠商投資提高排擠政府支出，政府赤字減少帶動總合需求曲線右移所致。
(D) 廠商投資提高造成物價上漲，廠商因而願意提高產量所致。
20. 下列何者並非一般國家在不景氣時會採用的反景氣政策？
(A) 降低利率。
(B) 擲節政府支出。
(C) 貶值。
(D) 以上均是緩和景氣的政府政策。

Part II : (共 40 分)

注意事項：計算填充題有二十大題，共 10 小題。依照格號順序，免寫演算過程，將答案寫在答案卷第一頁
選擇題作答區對應格號空格內（第 21 ~ 30 格），不需寫過程，只需填入最終數值。每格答對
得 4 分，答錯或未作答 0 分。

第一大題 (請依序填入 21~25 格)

The economy of Kiwa produces only two goods: apples and computers. The accompanying table shows the prices and output of the two goods for the years 2014 and 2015. Use 2014 as a base year. Round off to the second decimal place.

	Year 2014		Year 2015	
	quantity	price	quantity	price
computers	20	\$ 100	19.5	\$ 200
apples	1000	\$ 1	3450	\$ 0.5

21. What is the real GDP of 2015? _____。
22. What is the percentage change in real GDP from 2014 to 2015? _____%。
23. What is the percentage change in chain-weighted real GDP from 2014 to 2015? _____%。
24. What is the GDP deflator of 2015? _____。
25. What is the consumer price index of 2015? _____。

第二大題 (請依序填入 26~30 格)

不考慮國際貿易，假設一簡單凱因斯模型當中：

$$C = 100 + 0.8(Y - T), \quad I = 50, \quad G = 50, \quad T = 50,$$

式中 C 為家計部門消費支出、 Y 為所得、 T 為定額稅、 I 為廠商投資支出、 G 為政府消費支出。

26. 該模型之均衡國民所得為多少？
27. 均衡時的誘發性消費 (induced consumption) 為多少？
28. 自發性支出 (autonomous expenditure) 乘數為多少？(除不盡時請算到小數點第一位，以下四捨五入)
29. 其他條件不變，若投資由 50 單位變為 60 單位，則均衡所得將增加多少？
30. 其他條件不變，假設政府突然宣布要多徵收 100 單位的定額稅，並採取平衡預算的財政政策，以應付同時增加的 100 單位政府消費。請問新的均衡產出為多少？

國立中正大學 105 學年度碩士班招生考試試題
系所別：經濟學系國際經濟學-乙組

科目：經濟學

第 2 節

第 1 頁，共 4 頁

注意：本試卷有三部份，Part I 有 10 題單選題，Part II 有 2 大題填充題，Part III 有一大題

填充題。請考生答題前，務必閱讀每一部分的注意事項。

Part I：單選題（每題 3 分，共 30 分）

注意事項：依照題號順序，將答案寫在答案卷第一頁選擇題作答區對應題號空格內（第 1 ~ 10 格）。每格

答對得 3 分，答錯或未作答 0 分。

1. 關於政府支出「乘數效果 (multiplier effect)」的敘述，以下何者正確？

- (A) 邊際的儲蓄傾向越高，自發性支出的乘數效果越小。
- (B) 開放經濟體的支出乘數通常會比其他條件相似的封閉經濟體來得小。
- (C) 「排擠效果 (crowding-out effect)」越大，自發性支出的乘數效果越小。
- (D) 以上皆正確。

2. 西瓜標急需現金以資助某位候選人，由於手頭現金不足，只好處置其手中資產。理性的他會優先選擇：

- (A) 胡瓜上個月給的三百萬支票。
- (B) 車庫裡的法拉利。
- (C) 擺放在客廳裡的明代青花瓷。
- (D) 台東卑南溪附近的別墅。

3. 下列何者是中央銀行提高貨幣供給的方法？

- (A) 公開市場買進政府公債。
- (B) 調高超額準備率。
- (C) 調降存款準備率。
- (D) (A) 與 (C) 皆是。

4. 「貨幣中立性 (monetary neutrality)」是指

- (A) 貨幣供給變動不會影響政府預算。
- (B) 貨幣供給變動不會影響名目變數。
- (C) 貨幣供給變動不會影響實質變數。
- (D) 以上皆是。

5. 下列何者並非一般國家在不景氣時會採用的反景氣政策？

- (A) 降低利率。
- (B) 擲節政府支出。
- (C) 貨幣貶值。
- (D) 以上均是緩和或不景氣的政府政策。

國立中正大學 105 學年度碩士班招生考試試題
系所別：經濟學系國際經濟學-乙組

科目：經濟學

第 2 節

第 2 頁，共 4 頁

6. 依照總合供需模型，廠商投資提高會使該經濟體系產出增加，其原因為：
- (A) 廠商投資提高造成物價上漲，廠商因而願意提高產量所致。
 - (B) 廠商投資提高使資本累積，總合供給曲線因而右移所致。
 - (C) 廠商投資提高使體系貨幣變多，總合需求曲線因而右移所致。
 - (D) 廠商投資提高排擠政府支出，政府赤字減少帶動總合需求曲線右移所致。
7. 何者可能導致「停滯性通膨 (stagflation)」之發生？
- (A) 政府增加貨幣供給的成長速度。
 - (B) 廠商悲觀的預期。
 - (C) 能源危機。
 - (D) 以上皆是。
8. 中國不斷在其沿海進行軍事演習，搞的台灣人民人心慌亂，紛紛將存款換成美元匯往國外帳戶，外匯市場上會發生何種變動？
- (A) 外匯的需求曲線左移。
 - (B) 新台幣相對於美元會貶值。
 - (C) 外匯的供給曲線右移。
 - (D) 以上皆是。
9. Solow 成長模型對於經濟成長的描述，下列何者不正確？
- (A) 儲蓄率越高的國家，在經濟發展過程中會有較長一段時間的快速資本累積。
 - (B) 人口成長率提高時，長期穩定時平均每人資本與平均每人產出都不受影響。
 - (C) 一國發展初期成長較慢，隨經濟發展，成長速度會逐漸下降至長期穩定水準。
 - (D) 假若各國的生產技術、人口成長率和儲蓄率相同，就算期初資本量不同，最終收斂的每人所得仍相同。
 - (E)
10. 一個國家的經濟成長率一直維持每年 5% 時，它大概多久能將該國所得變成二倍？
- (A) 5 年以內。
 - (B) 6~10 年。
 - (C) 11~15 年。
 - (D) 15 年以上才可能。

~~請翻頁繼續作答~~

Part II：填空题 (每格 2 分，共 20 分)

注意事項：(1) 第一大題為一般填充題，共 5 格 (第 11~15 格)。

(2) 第二大題為計算填充題，共 5 格 (第 16~20 格)，計算不需寫過程，只需填入最終數值。
請依照格號順序，將答案寫在答案卷第一頁選擇題作答區對應格號空格內 (第 11~20 格)。每格答對得 2 分，答錯或未作答 0 分。

第一大題：請根據 IS-LM 模型回答下列問題 -

1. IS-LM 模型作圖時，縱軸的變數是哪一個經濟變數？ (11)
2. IS-LM 模型作圖時，橫軸的變數是哪一個經濟變數？ (12)
3. 作圖時，一般 IS-LM 模型中之 IS 曲線是正斜率，還是負斜率的那一條線？請回答：正/負/水平/垂直，四者之一。 (13)
4. 以 IS-LM 模型分析我國經濟時，若遇到中國經濟衰退，會不會直接影響到 IS 曲線的位置？請回答：左移/右移/不會，三者之一。 (14)
5. 以 IS-LM 模型分析我國經濟時，若遇到中國經濟衰退，會不會直接影響到 LM 曲線的位置？請回答：左移/右移/不會，三者之一。 (15)

第二大題 (計算填充題，16~19 格免寫演算過程，答案請計算到小數點第一位，以下四捨五入)

T 國國民 qq 自其政府統計網站取得多筆重要經濟數據 (定義與我國相同)，qq 並算出其近三年之年增率如下表：

原始經濟數據 \ 年	國內生產毛額 (實質值，單位百萬元 T 元)	國民所得 (當期價格，單位百萬元 T 元)	國民所得 (當期價格，單位百萬元美元)	消費者物價指數	T 元兌一美元匯率	名目利率	失業率	人口 (單位千人)
2013	-1.6%	3%	2.5%	-1%	4%	5%	6%	0.5%
2014	-2.2%	4.8%	3.8%	2.9%	4.1%	-2.4%	5%	1.1%
2015	1.2%	6.0%	4.2%	0.2%	0.3%	0.8%	4%	1.4%

在 2014 年，該國之經濟成長率為 (16) %；通貨膨脹率為 (17) %；實質利率為 (18) %；痛苦指數為 (19) %；T 元相對於美元是升值或貶值？ (20)

Part III：填充題 (每格 5 分，共 50 分)

Instruction: Answer the following questions (21) to (30).

1. Timberwolves is a firm with total revenue $R = pq$, where p is the price of their products and q is the quantity of their products. Both p and q are under control of the firm, but the two variables can not adjust simultaneously. Find (21) the range of consumers' elasticity where the firm has the incentive to reduce the price and (22) the range of consumers' elasticity where the firm has the incentive to decrease their quantity of supply.
2. Anthony-Towns has a utility function $u(x, y) = xy$, where x is food and clothing is y . Anthony-Towns has an income of \$14,000 and price of clothing is \$100 per unit. Suppose that the price of food rises from \$50 to \$70. Calculate (23) the compensation variation, (24) equivalence variation, and (25) the change of consumer surplus of this price change.
3. Consider a monopoly with marginal cost $MC(q) = 20 + 20q$ facing a demand $p(q) = 200 - 20q$. Find (26) equilibrium price and quantity, (27) consumer surplus and producer surplus. If this monopoly exercises first-degree price discrimination, (28) how much will it charge for each unit of output and how many unit will it produce?
4. Emma has a wealth of \$81 and is an expected utility maximizer with utility function \sqrt{x} . She is afraid of oversleeping her microeconomics exam. She figures there is only a 1 in 9 chance that she will, but if she does, it will cost her \$81 in fees to the university for taking an exam late. Emma's neighbor, Mitch, never oversleeps. He offers to wake her one hour before the test, but she must pay him for this service. (29) What is the most that Emma would be willing to pay for this wake-up service?
5. A student is caught cheating during the exam. The proctor previously decided whether to collect the evidence that showing the student cheated (for example, a witness). If the proctor does not show the evidence- either because he doesn't have one or has one and hides it- the student has to decide whether to confess. If the proctor does have the evidence and shows it, then the student's payoff is 0 regardless of the strategy chosen. The strategic form of this situation is shown as following.

		Student	
		Confess	Do not confess
Proctor	No evidence	12, 6	4, 12
	Evidence, hide	10, 8	6, 4
	Evidence, show	$y, 0$	$y, 0$

Note that all payoffs have been specified, except for the proctor's payoff when he chooses to have the evidence and show it. (30) Find a condition on y whereby there is a Nash equilibrium in which the proctor randomizes over the two pure strategies evidence, hide evidence and no evidence and the student randomizes over *Confess* and *Do Not confess*. (i.e., y indicates the limit of his sympathy to the student.)

注意：本試卷共有二頁。請考生答題前，務必閱讀注意事項說明！

計算問答說明題 (100 分)

注意：答案請詳細說明理由或計算過程，僅回答數字未加以說明不予計分

1. (40%) Two fair coins are tossed. Based on the outcomes, the following two random variables are defined:

X = the number of heads in the outcome;

$$Y = \begin{cases} 1, & \text{if two heads or two tails;} \\ 0, & \text{if one head and one tail.} \end{cases}$$

- (a) Please write down the joint probability distribution of X and Y . (5%)
(b) Find $\text{Cov}(X, Y)$. (5%)
(c) Are X and Y independent to each other? Why or why not? (5%)
(d) Let $h(X, Y) = 2X^2 + Y$, find $E[h(X, Y)]$. (5%)

Moreover, we define the following events:

$A = \{\text{Observe at least one head}\}$

$B = \{\text{Observe exactly one head}\}$

- (e) Find $P(A)$. (5%)
(f) Find $P(B)$. (5%)
(g) Find $P(A \cap B)$. (5%)
(h) Find $P(B|A)$. (5%)

2. (10%) We say a random variable X follows the exponential distribution, if it has the following probability density function:

$$f(x) = \begin{cases} \frac{1}{\theta} e^{-\frac{x}{\theta}} & \text{if } x > 0; \\ 0 & \text{otherwise;} \end{cases}$$

where $\theta > 0$ is the parameter of the distribution.

- (a) Using the maximum likelihood (ML) method, show that the ML estimator of θ is $\hat{\theta} = \frac{\sum X_i}{n}$, where n is the sample size. (5%)
(b) Show that $\hat{\theta}$ is a consistent estimator of θ . (5%)

3. (50%) Consider the following regression, regressing Food expenditure (Foodexp) on total expenditure (Totalexp):

$$\text{Foodexp}_i = \beta_1 + \beta_2 \times \text{Totalexp}_i + \varepsilon_i, \quad \text{where } i = 1, \dots, n.$$

The regression result is

$$\widehat{\text{Foodexp}}_i = 28.5568 + 0.5733 \text{ Totalexp}_i \\ \text{se}(\hat{\beta}_1) = 49.0804 ; \text{se}(\hat{\beta}_2) = 0.0935$$

ANOVA table for the food expenditure regression

Source of variation	SS	df	MSS	F
Due to regression (ESS)	43509	(2)	(4)	(6)
Due to residual (RSS)	(1)	(3)	(5)	
TSS	65495	20		

- (a) What are the values of (1), (2), (3), (4), (5) and (6)? (24%)
 (b) State the procedure for testing the hypothesis that there is no relationship between food expenditure on total expenditure at the level of significance $\alpha = 0.05$. Please be specific on your null and alternative hypotheses, test statistics and the decision rule. (11%)
 (c) Show the t and F test statistics for testing the null hypothesis $\beta_2 = 0$ have the relationship $F = t^2$. (5%)
 (d) Compute the coefficient of determination R^2 . (5%)
 (e) Show $F = \frac{(n-2)R^2}{1-R^2}$. (5%)