1- If nominal annual rate of return is 10% and 6-monthes payment effective rate of interest is 5.×××%, determine the frequency of compounding?

a. monthly   b. bi-monthly   c. quarterly   d. semi-annually   e. annually   f. None of these values

2- A man took a housing loan of $ 2,500,000. The loan is to be repaid in 120 monthly installments of $ 30,000 each to be paid at the end of each month based on monthly compounded interest rate. What is the effective interest rate per year

a. 6.84%   b. 7.84%   c. 8.84%   d. 9.84%   e. 10.84%   f. None of these values

3- A company borrows $ 100,000 at 8% interest. Equal annual payments are to be made for 6 years. However at the time of 4th Payment, the company decides to pay off (سداد كل المستحقات المتبقية) the entire loan. The amount to be paid at the end of 4th year is---------------.

a. $35,105   b. $64,895   c. $60,206   d. $40,105   e. $50,206   f. None of these values

Question (3) (25 %)

An Egyptian company sells three production lines at the prices and contribution margins shown in Table (1)

The current and expected quantities of sales in 2015 and 2016 respectively are also included in the Table.

Table(1)

Production line	Unit selling Price	Unit contribution margin	Current quantities 2015	Expected quantities 2016
1	100 pounds	25 pounds	3,000 units	X=??
2	120 pounds	24 pounds	4,000 units	4,000 units
3	200 pounds	80 pounds	3,000 units	Y=??

The fixed operating costs were 100,000 pounds in 2015 and will be increased to 150,000 pounds in 2016.

How many units of production lines 1 (X) & 3 (Y) should be sold in 2016 to earn the same profit of year 2015 under a given one condition: the total variable cost in 2016 remains the same as it was in 2015.
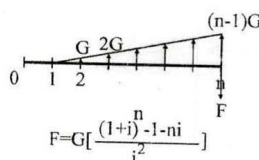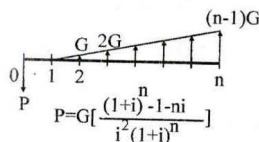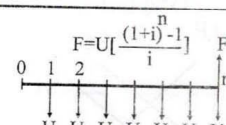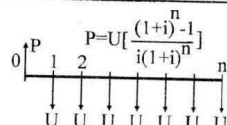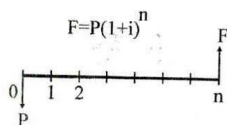
Question (4) (25 %)

A finance company advertises an investment plan. In this plan, for every $1,000 invested, the company pays $2,000 at the end of the 10th year and $4,000 at the end of 15th year. The estimates of the eventual outcomes of this plan are as follows: (تقديرات الشركة بالمحصلة المتوقعة لخطة الاستثمار المعلنة)

a- $5,000,000 as soon as the plan is advertised (at t=0),

b- $3,000,000 one year after the plan is advertised (at t=1).

The finance company will use these payments (as soon as received) in construction industry investments. Estimates show that the return of each $1,000 invested in construction projects is equal installments of $305 for 16 years (equal u=$305 at the end of each year for 16 years --from t=1 to t=16-- for each $1,000 invested at t=0)

1-If the MARR of the finance company=30%, is the investment in construction industry feasible?

2-Calculate the IRR for the company's investment in construction projects.

$$F=P(1+i)^n$$

$$P=U[\frac{(1+i)^n-1}{i(1+i)^n}]$$

$$F=U[\frac{(1+i)^n-1}{i}]$$

$$P=G[\frac{(1+i)^n-1-ni}{i^2(1+i)^n}]$$

$$F=G[\frac{(1+i)^n-1-ni}{i^2}]$$

$$i_e=(1+\frac{r}{s})^s-1$$
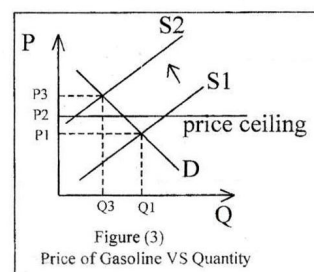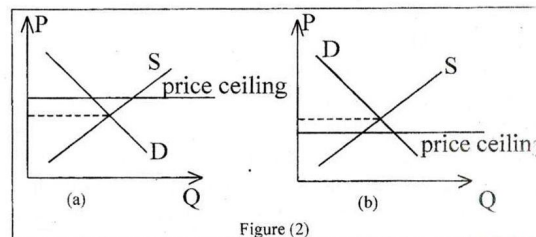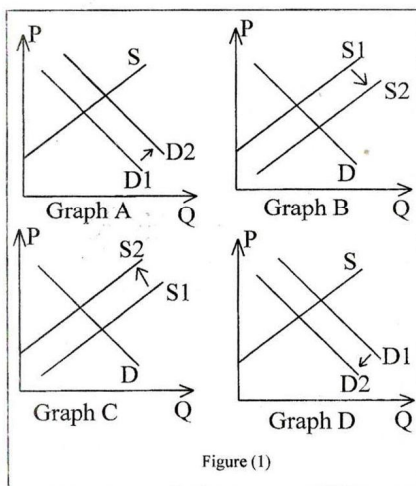
if s = infinity

$$i_e=e^r-1$$

Question (1) (25 %)   Choose the right answer:

1. In Figure (1), Which graph best illustrates the first reaction of market for wooden windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

2. In Figure (1), Which graph best illustrates the first reaction of market for aluminum windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

3. In Figure (1), which graph best illustrates the first reaction of market for local-made wooden windows accessories (الاكسسوارات المحلية الصنع المكملة لعملية تصنيع النوافذ الخشبية) after imposing restrictions on imports of many types of wood (فرض قيود علي استيراد)
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

4. In Figure (2), a binding price ceiling is shown in
   A. panel (a).
   B. panel (b).
   C. both panel (a) and panel (b).
   D. neither panel (a) nor panel (b).

5. Suppose that the number of buyers in a market increases and a technological advancement occurs also. What would we expect to happen in the market?
   A. The equilibrium price would increase, but the impact on the amount sold in the market would be indeterminate.
   B. The equilibrium price would decrease, but the impact on the amount sold in the market would be indeterminate.
   C. Both equilibrium price and equilibrium quantity would increase.
   D. Equilibrium quantity would increase, but the impact on equilibrium price would be indeterminate.

6. According to Figure (3), when the supply curve for gasoline shifts from S1 to S2
   A. the price will increase to P3.
   B. a surplus will occur at the new market price of P2.
   C. the market price will stay at P1 due to the price ceiling.
   D. a shortage will occur at the price ceiling of P2.

ضع اجابتك النهائية في جدول كما يلى
(لن يلتفت للاجابات الغير منظمة)

Question	The choice
1	??
2	??
3	??
4	??
5	??
6	??

Figure (1)

Figure (2)

Figure (3)
Price of Gasoline VS Quantity

Choose the right answer: ضع اجابتك النهائية في جدول كما هو مبين بالسؤال الاول (لن يلتفت للاجابات الغير منظمة)

1- If nominal annual rate of return is 10% and 6-monthes payment effective rate of interest is 5.0838%, determine the frequency of compounding?
a. monthly   b. bi-monthly   c. quarterly   d. semi-annually   e. annually   f. None of these values

2- A man took a housing loan of $ 2,500,000. The loan is to be repaid in 120 monthly installments of $ 31,000 each to be paid at the end of each month based on monthly compounded interest rate. What is the effective interest rate per year?
a. 6.84%   b. 7.84%   c. 8.84%   d. 9.84%   e. 10.84%   f. None of these values

3- A company borrows $ 100,000 at 8% interest. Equal annual payments are to be made for 6 years. However at the time of 4th Payment, the company decides to pay off (سداد كل المستحقات المتبقية) the entire loan. The amount to be paid at the end of 4th year is---------------.
a. $35,105   b. $64,895   c. $60,206   d. $40,105   e. $50,206   f. None of these values

Question (3) (25 %)

An Egyptian company sells three production lines at the prices and contribution margins shown in Table (1)

The current and expected quantities of sales in 2015 and 2016 respectively are also included in the Table.

Table(1)

Production line	Unit selling Price	Unit contribution margin	Current quantities 2015	Expected quantities 2016
1	100 pounds	25 pounds	3,000 units	X=??
2	120 pounds	24 pounds	4,000 units	4,000 units
3	200 pounds	80 pounds	3,000 units	Y=??

The fixed operating costs were 100,000 pounds in 2015 and will be increased to 150,000 pounds in 2016.

How many units of production lines 1 (X) & 3 (Y) should be sold in 2016 to earn the same profit of year 2015 under a given one condition: the total variable cost in 2016 remains the same as it was in 2015.
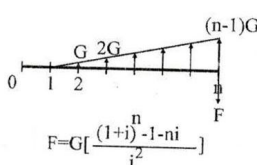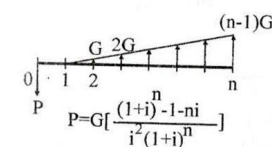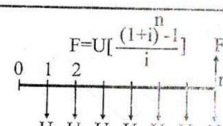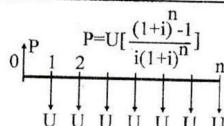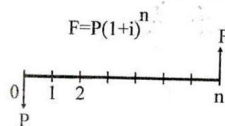
Question (4)   (25 %)

A finance company advertises an investment plan. In this plan, for every $1,000 invested, the company pays $4,000 at the end of the 10th year and $4,000 at the end of 15th year. The estimates of the eventual outcomes of this plan are as follows: (تقديرات الشركة بالمحصلة المتوقعة لخطة الاستثمار المعلنة)

a- $5,000,000 as soon as the plan is advertised (at t=0),
b- $3,000,000 one year after the plan is advertised (at t=1).

The finance company will use these payments (as soon as received) in construction industry investments. Estimates show that the return of each $1,000 invested in construction projects is equal installments of $305 for 16 years (equal u=$305 at the end of each year for 16 years --from t=1 to t=16-- for each $1,000 invested at t=0)

1-If the MARR of the finance company=30%, is the investment in construction industry feasible?
2-Calculate the IRR for the company's investment in construction projects.

$$F=P(1+i)^n$$

$$P=U[\frac{(1+i)^n -1}{i(1+i)^n}]$$

$$F=U[\frac{(1+i)^n -1}{i}]$$

$$P=G[\frac{(1+i)^n -1-ni}{i^2(1+i)^n}]$$

$$F=G[\frac{(1+i)^n -1-ni}{i^2}]$$

$$i_e=(1+\frac{r}{S})^S - 1$$
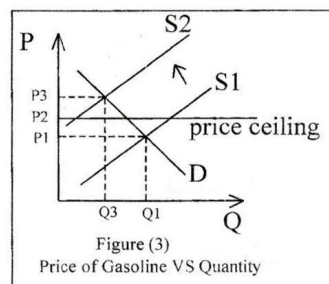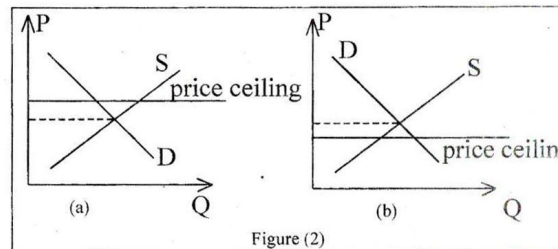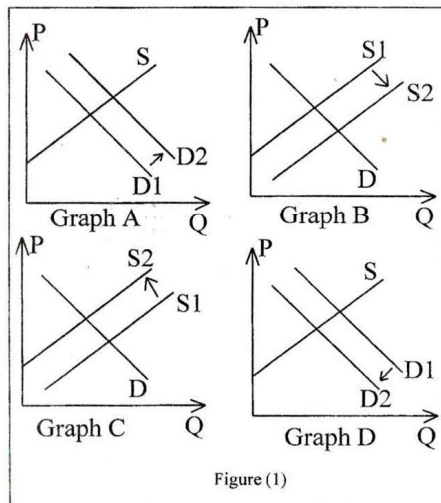
if s = infinity

$$i_e= e^r - 1$$

Question (1) (25 %)   Choose the right answer:

1. In Figure (1), Which graph best illustrates the first reaction of market for wooden windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).
2. In Figure (1), Which graph best illustrates the first reaction of market for aluminum windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).
3. In Figure (1), which graph best illustrates the first reaction of market for local-made wooden windows accessories (الاكسسوارات المحلية الصنع المكملة لعملية تصنيع النوافذ الخشبية) after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).
4. In Figure (2), a binding price ceiling is shown in
   A. panel (a).
   B. panel (b).
   C. both panel (a) and panel (b).
   D. neither panel (a) nor panel (b).
5. Suppose that the number of buyers in a market increases and a technological advancement occurs also. What would we expect to happen in the market?
   A. The equilibrium price would increase, but the impact on the amount sold in the market would be indeterminate.
   B. The equilibrium price would decrease, but the impact on the amount sold in the market would be indeterminate.
   C. Both equilibrium price and equilibrium quantity would increase.
   D. Equilibrium quantity would increase, but the impact on equilibrium price would be indeterminate.
6. According to Figure (3), when the supply curve for gasoline shifts from S1 to S2
   A. the price will increase to P3.
   B. a surplus will occur at the new market price of P2.
   C. the market price will stay at P1 due to the price ceiling.
   D. a shortage will occur at the price ceiling of P2.

ضع اجابتك النهائية في جدول كما يلى
(لن يلتفت للاجابات الغير منظمة)

Question	The choice
1	??
2	??
3	??
4	??
5	??
6	??

Graph A   Graph B   Graph C   Graph D

Figure (1)

Figure (2)

Figure (3)
Price of Gasoline VS Quantity

Choose the right answer:

1- If nominal annual rate of return is 10% and 6-monthes payment effective rate of interest is 5.0838%, determine the frequency of compounding?

a. monthly   b. bi-monthly   c. quarterly   d. semi-annually   e. annually   f. None of these values

2- A man took a housing loan of $ 2,500,000. The loan is to be repaid in 120 monthly installments of $ 31,000 each to be paid at the end of each month based on monthly compounded interest rate. What is the effective interest rate per year?

a. 6.84%   b. 7.84%   c. 8.84%   d. 9.84%   e. 10.84%   f. None of these values

3- A company borrows $ 100,000 at 8% interest. Equal annual payments are to be made for 6 years. However at the time of 4th Payment, the company decides to pay off (سداد كل المستحقات المتبقية) the entire loan. The amount to be paid at the end of 4th year is---------------.

a. $35,105   b. $64,895   c. $60,206   d. $40,105   e. $50,206   f. None of these values

Question (3) (25 %)

An Egyptian company sells three production lines at the prices and contribution margins shown in Table (1)

The current and expected quantities of sales in 2015and 2016 respectively are also included in the Table.

Table(1)

Production line	Unit selling Price	Unit contribution margin	Current quantities 2015	Expected quantities 2016
1	100 pounds	25 pounds	3,000 units	X=??
2	120 pounds	24 pounds	4,000 units	4,000 units
3	200 pounds	80 pounds	3,000 units	Y=??

The fixed operating costs were 100,000 pounds in 2015 and will be increased to 150,000 pounds in 2016.

How many units of production lines 1 (X) & 3 (Y) should be sold in 2016 to earn the same profit of year 2015 under a given one condition: the total variable cost in 2016 remains the same as it was in 2015.

Question (4) (25 %)

A finance company advertises an investment plan. In this plan, for every $1,000 invested, the company pays $4,000 at the end of the 10th year and $4,000 at the end of 15th year. The estimates of the eventual outcomes of this plan are as follows: (تقديرات الشركة بالمحصلة المتوقعة لخطة الاستثمار المعلنة)
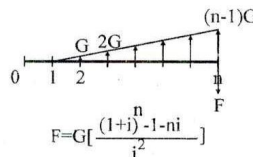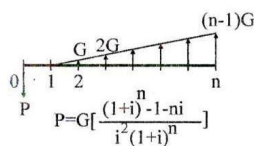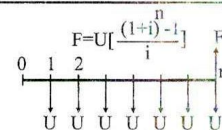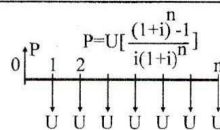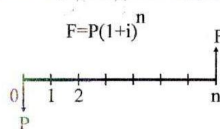
a- $5,000,000 as soon as the plan is advertised (at t=0),

b- $3,000,000 one year after the plan is advertised (at t=1).

The finance company will use these payments (as soon as received) in construction industry investments. Estimates show that the return of each $1,000 invested in construction projects is equal installments of $305 for 16 years (equal u=$305 at the end of each year for 16 years --from t=1 to t=16-- for each $1,000 invested at t=0)

1-If the MARR of the finance company=30%, is the investment in construction industry feasible?

2-Calculate the IRR for the company's investment in construction projects.

$$F=P(1+i)^n$$

$$P=U\left[\frac{(1+i)^n-1}{i(1+i)^n}\right]$$

$$F=U\left[\frac{(1+i)^n-1}{i}\right]$$

$$P=G\left[\frac{(1+i)^n-1-ni}{i^2(1+i)^n}\right]$$

$$F=G\left[\frac{(1+i)^n-1-ni}{i^2}\right]$$

$$i_e=\left(1+\frac{r}{S}\right)^S-1$$

if s = infinity

$$i_e=e^r-1$$

1st Term 2015/2016

Fayoum University
Faculty of Engineering
Engineering Economy

Time Allowed

3 hours

Question (1) (25 %) Choose the right answer:

1. In Figure (1), Which graph best illustrates <u>the first reaction of</u> market for wooden windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

2. In Figure (1), Which graph best illustrates <u>the first reaction of</u> market for aluminum windows after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

3. In Figure (1), which graph best illustrates <u>the first reaction of</u> market for local-made wooden windows accessories (الاكسسوارات المحلية الصنع المكملة لعملية تصنيع النوافذ الخشبية) after imposing restrictions on imports (فرض قيود علي استيراد) of many types of wood
   A) Graph (A).
   B) Graph (B).
   C) Graph (C).
   D) Graph (D).

4. In Figure (2), a binding price ceiling is shown in
   A. panel (a).
   B. panel (b).
   C. both panel (a) and panel (b).
   D. neither panel (a) nor panel (b).

5. Suppose that the number of buyers in a market increases and a technological advancement occurs also. What would we expect to happen in the market?
   A. The equilibrium price would increase, but the impact on the amount sold in the market would be indeterminate.
   B. The equilibrium price would decrease, but the impact on the amount sold in the market would be indeterminate.
   C. Both equilibrium price and equilibrium quantity would increase.
   D. Equilibrium quantity would increase, but the impact on equilibrium price would be indeterminate.

6. According to Figure (3), when the supply curve for gasoline shifts from S1 to S2
   A. the price will increase to P3.
   B. a surplus will occur at the new market price of P2.
   C. the market price will stay at P1 due to the price ceiling.
   D. a shortage will occur at the price ceiling of P2.

ضع اجابتك النهائية في جدول كما يلي
(لن يلتفت للاجابات الغير منظمة)

Question	The choice
1	??
2	??
3	??
4	??
5	??
6	??

Graph A
Graph B
Graph C
Graph D
Figure (1)

Figure (2)

Figure (3)
Price of Gasoline VS Quantity