كتابي كتابي
#جيل يصنع
التميز
#اسئلة اقتصاد
هندسي

Question Four (12 Marks)

a- Given: A mechanical engineer is considering two machines at 16% per annum, if the project life is expected to be 4 years, which is the better deal?

	Type X	Type Y
First cost, $	-7,650	-12,500
Maintenance, $/yr	-1200	-900
Salvage, $	0	2000
Life, years	2	4

b- Given: An investment of $20,000/year for 100 years and an investment of $20,000/year forever at an interest rate of 10 % per year. Find: What's the difference in PW?

c- Find the nominal rate of return for a project the following project

N	Cash flows
0	-12,000
1	4200
2	6225
3	6330

Question Five (10 Marks)

Dunnikier crushed stone is available for purchase for $ 2.1 million. The current relevant production and cost data have been estimated as follows:

1- production rate 650,000 tpy, 3 year life
2- sales price: $ 9 per ton
3- Mining cost: $ 1 per ton
4- Crushing and screening cost: $ 0.75 per ton
5- General plant expense: $ 1.05 per ton
6- Transportation to market (contracted): 1.35 per ton
7- Corporate tax rate 6 %
9- Anticipated rate of inflation 9 %
10- Real interest rate 10 %

Evaluate the investment opportunity "NPV" using real dollars method?

Al-Hussein bin Talal University
College of Engineering
Engineering Economics

Final Exam
8/1/2011

Semester One 2010/2011

(A)

Question One (12 Marks)

a- You are considering a project with the following financial data:

- Required initial investment at $50M
- Project life: 10 years
- Estimated annual revenue: $X (unknown)
- Estimated annual operating cost: $15M
- Required minimum return: 20%
- Salvage value of the project: 15% of the initial investment

What would be the minimum annual revenue (in $M) that must be generated to make the project worthwhile?

b- How much money should be deposited now in an account that pays 10% interest compounded annually in order to make 5 equal annual withdrawals of $8,000?

Question Two (10 Marks)

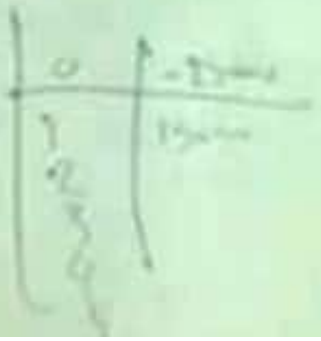
A series of five real dollar payments beginning with $ 6000 at the end of the first year. Assume that the average general inflation rate is 4 % and the market interest rate is 11 %

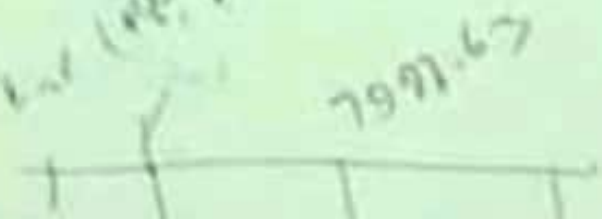
1- What is the equivalent present worth of the real series?

2- What is the equivalent present worth of the current series?

Question Three (8 Marks)

A construction firm is considering establishing an engineering computing centre. This centre will be equipped with three engineering work stations that each would cost $ 25,000 and have a service life of five years. The expected salvage value of each workstation is $ 2,000, the annual operating and maintenance cost would be $ 15,000 for each workstation. At a MARR of 15 %, determine equivalent annual cost of operating the engineering centre.





17/11/2011 A

Question 1 (6 Marks)

a- You borrowed $ 6000 at 7 % interest rate compounded annually to buy a car, What is the annual payment? The average monthly payment?

b- You deposit $ 3000 in a saving account that earns 9 % simple interest per year. How many years it takes to double your balance?

Question 2 (4 Marks)

You are preparing to buy a vacation home eight years from now. The home will cost 50,000 at that time. You plan on saving three deposits at an interest rate of 10 %

Deposit 1: Deposit 10,000 today
Deposit 2: Deposit 12,000 two years from now
Deposit 3: Deposit X five years from now

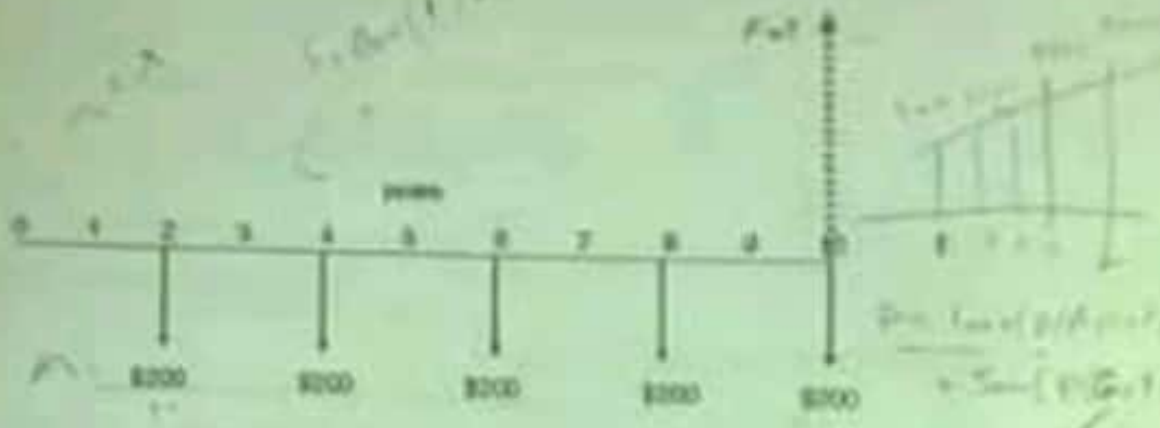
How much do you need to invest in year five to ensure that you have the necessary funds to buy the vacation home at the end of year eight?

Question 3 (3 Marks)

You borrowed $ 10,000 from a local bank with agreement that you will pay back th

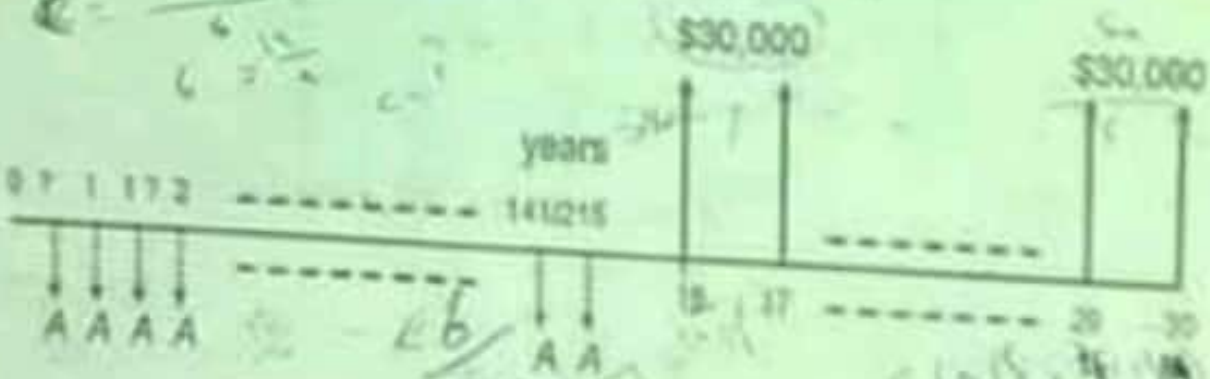
Question Three (4 Marks)

Compute the value of F in the following cash flow diagram. Assume i= 12%, compounded annually. (3 Marks)



Question four (8 Marks)

A- Henry Jones is planning to retire in 15 years. He wishes to deposit an equal amount (A) every 6 months until he retires so that, beginning one year following his retirement, he will receive annual payments of $30,000 for the next 15 years. Determine the value of *A* which he must deposit every 6 months if the interest rate is 8%, compounded semi-annually.



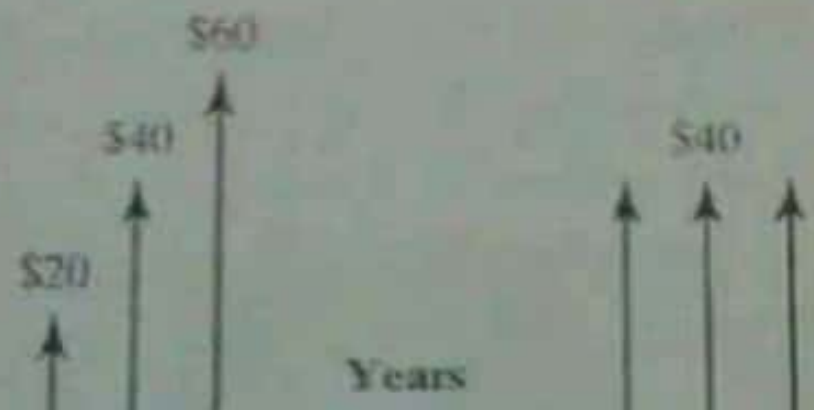
b- Find the effective interest rate semiannually for a nominal rate of 10 % compounded fortnightly?

Question one (4 Marks)

Solve for the present worth of the cash flow shown in the accompanying diagram using at most three interest factors at 10% interest compounded annually.

$i = 10\%$

$P =$



Q1: If $100 is invested at 6% interest per year, compounded annually, W be the value of this investment after four years?(5 marks)

Q2: If $100 is invested at 6% interest, compounded monthly, what could value of this investment after four years. (5 marks)

Q3: A $100 investment now in an account that pays compound interest a be worth $250 at a point exactly 31 years from now. What annual interes this account pay? Use i=3%. (5 marks)

Q4: If $100 is invested at the end of each year for the next ten years in a account that pays 5% interest, how much will be in the account immedia the tenth payment? (5 marks)

Q5: Suppose that a recent college graduate has $3,000 available as a firs on a new car. The graduate can afford a uniform car loan payment of no $500 per month for 48 months, beginning one month from now. Interest compounded monthly. What is most that the graduate can spend today car? (6 marks)

Q6: An investor has purchased a new machine. He would like to save en in a bank account to pay the maintenance on the new car for the first 6 y been estimated that the maintenance cost of the car is as follows:

Year	Maintenance cost in $
1	160
2	180

Al-Hussein bin Talal University
College of Engineering
Engineering Economics

Final Exam
23/7/2012

Summer Semester 2012/2013

Question One (10 Marks)

Consider a 5 year life project that:

- Requires a capital investment of $ 1.8 M in year 0 to be fully depreciated over 5 years
- Produces real revenue of $ 4.6 M per year with a real operating costs of $ 2.7 M per year
- The real discount rate is 10.5% and we assume that inflation will average 9 % per year over the life of the project.

Calculate the discount pay back period of the project in real term method, assuming 6 % tax rate?

Question Two (15 Marks)

a- You plan to provide a retirement fund for yourself by making end-of-year deposits of $1,000 for each of the next 35 years into a fund which earns 5% interest (i = 5% per year). After 35 years you will withdraw $5,082 per year until the fund is exhausted.
How long (to the nearest year) will it take to exhaust the fund that you have built up for 35 years?

b- A large chemical plant is being planned with the capacity to produce 3 million pounds (lb.) of product annually. Raw-materials costs for the product are $0.45/lb, labor costs are $0.40/lb., and utility costs are $0.25/lb. Overhead costs are 75% of the labor costs. If the company desires a profit equal to 20% of the total product cost, estimate the selling price per pound of product.

Question Three (25 Marks)

a- Find the value of Z if you know that nominal interest rate is 12 % compounded quarterly?

Question Four (6 Marks)

A mail order firm has expected cash flows for two machines including maintenance costs, salvage values and tax effects as follows:

n	Model A ($)	Model B ($)
0	-14,500	-17,000
1	-3,000	-5,000
2	-7,500	-10,500
3	8,000+3,000	-2,000
4		-8,000+3,000
5		
6		

As business grows neither of the models may be able to handle the expanded volume at the end of year 6, with this scenario, which model should the firm select at MARR = 15 %?
(suppose that the company considers buying comparable equipment that can assure leasing revenues of $ 9000 with annual operating cost of $ 3500)

Question Five (5 Marks)

A construction firm is considering establishing an engineering computing centre. This centre will be equipped with three engineering workstations that each would cost $ 25,000 and have a service life of five years. The expected salvage value of each workstation is $ 7,000, the annual operating and maintenance cost would be $ 15,000 for each workstation. At a MARR of 15 %, determine equivalent annual cost of operating the engineering centre (5 Marks)

Bonus Question (3 Marks)

You purchased a stamping machine at $100,000 to produce a new line of products. The stamping machine will be used for 5 years and the expected salvage value of the machine is 20% of the initial cost. The annual operating and maintenance costs amount to $50,000. If each part stamped generates $13 revenue, how many parts should be stamped each year to just break? Assume that you require a 15% return on your investment.

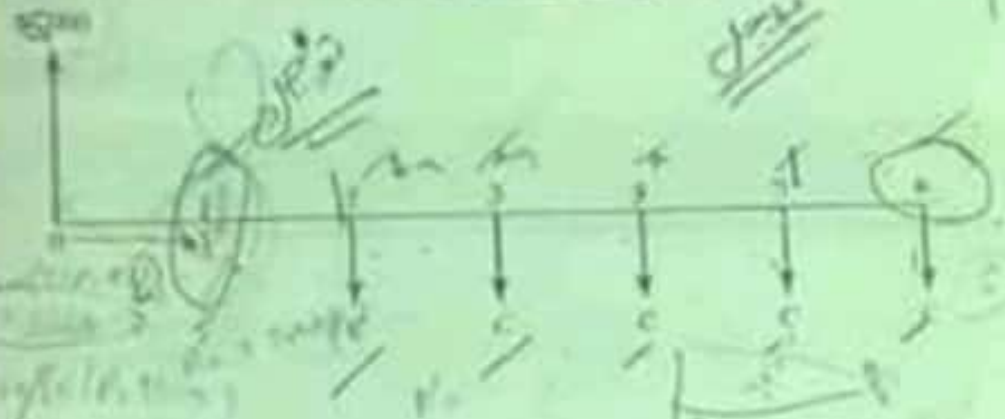
Al-Hussein bin Talal University
College of Engineering
Engineering Economics

First Exam
2011/2010

First semester/ 2010/2011

Question 1: You want to set up college saving plan for your son who currently 11 years old and will go to college at age 18. When he starts college the needs [illegible] in the bank. How much do you need to [illegible] now in order to have the necessary [illegible] if the current rate of interest is 8%?

Question 2: You borrowed $5,000 to finance your educational expenses at the beginning of your junior year of college at an interest rate of 9% compounded annually. You are required to pay off the loan with five equal annual installments, but the first payment will be deferred until your graduation. Determine the value of C, the amount of annual payments.



Question 3: Five annual deposits in the amounts of $1500, $1200, $900, $600, and $300 are made into a fund that pays interest at a rate of 5% compounded annually. Determine the balance in the fund immediately after the fifth deposit using the linear gradient method?

Question 4

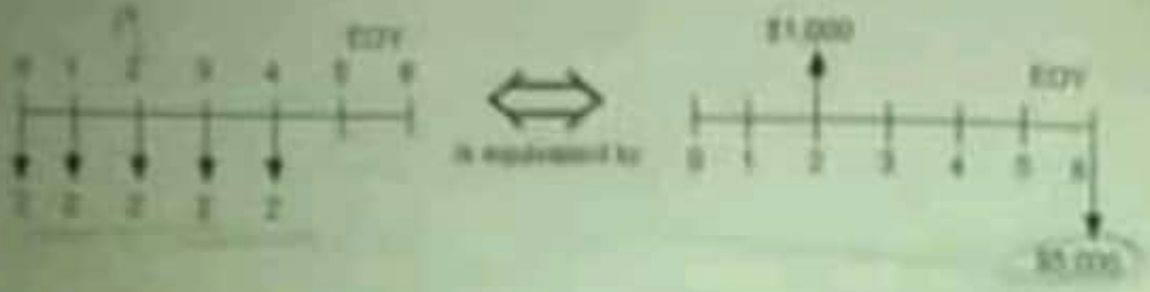
What equal series of payment in order to accumulate 30,000 in five years at 8 % compounded monthly when payments are monthly?

What equal series of payment in order to accumulate 30,000 in five years at 8 % compounded monthly when payments are monthly?

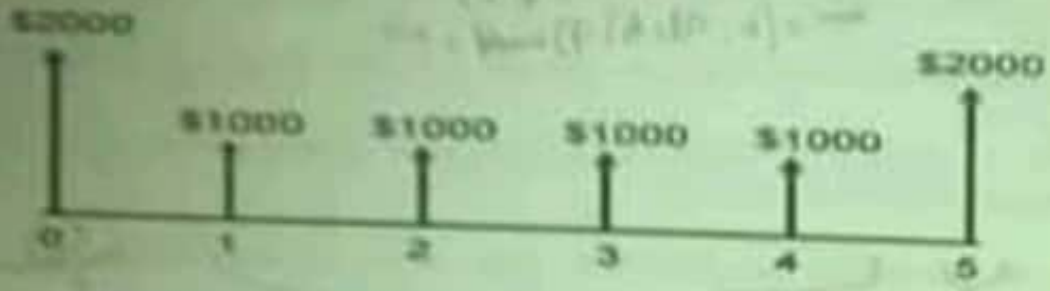
Question 5: The current gasoline price is $4.10, and it is projected to increase next year by 10% and 8% the following year, and 4% the third year.

a- What is the average inflation rate for the projected gasoline price for the next 3 years?

b- Construct CFD if you know that the second year is the base year?



b- What is the equivalent present worth for the following cash flow series at an interest rate of 15%?



c- The current gasoline price is $4.15, and it is projected to increase next year by 5%, and 8% the following year, and 4% the third year. What is the average inflation rate for the projected gasoline price for the next 3 years?

d- In view of the information given below, determine the value of each "?" in the following table. The loan is to be repaid in three equal end-of year payments.

Loan principal = $10,000

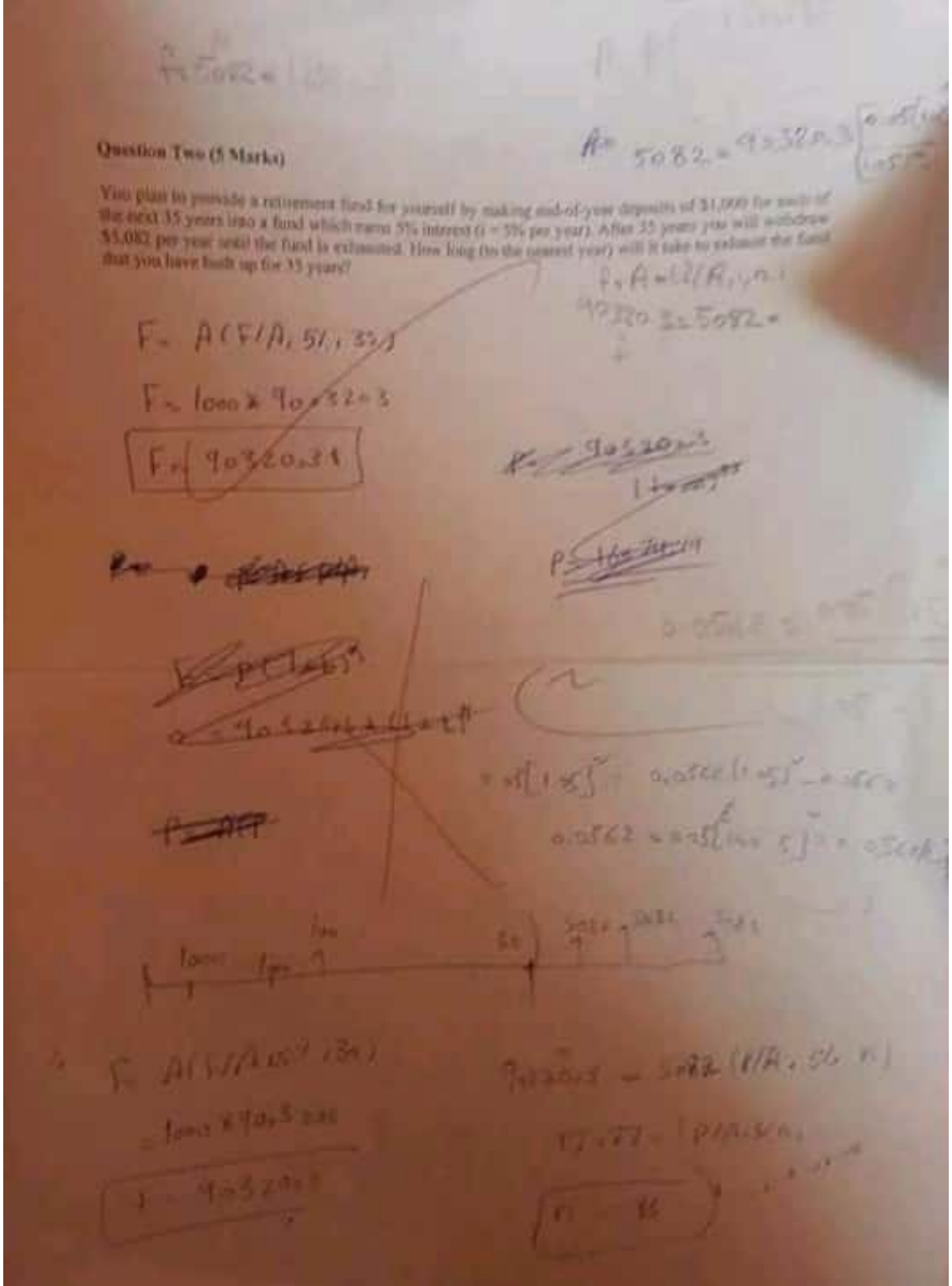
Interest Rate/Yr. = 8%

Duration of Loan = 3 Yrs.

Year	Interest Paid	Principal repayment
1	800	?
2	553.6	3,326.4
3	?	?

Question Two (5 Marks)

You plan to provide a retirement fund for yourself by making end-of-year deposits of $1,000 for each of the next 35 years into a fund which earns 5% interest (i = 5% per year). After 35 years you will withdraw $5,082 per year until the fund is exhausted. How long (to the nearest year) will it take to exhaust the fund that you have built up for 35 years?



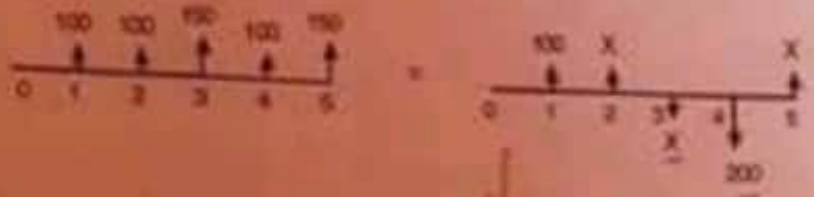
1- If $200 is deposited in a savings account at the beginning of each of 12 years and the account earns interest at 8% per compounded annually, the value of the account at the end of 12 years will be nearly:

(a) $6,000 (b) $5,400 (c) $5,865 (d) 3,795 (e) 4,099 (f) 9,000

2- You are planning to borrow $100,000 on a 10-year, 6%, with 10 annual payments. What fraction of the payment made at the end of the second year will represent repayment of principal?

a) 40.81 % b) 59.19 % c) 45.88 % d) 41.81% e) 39.5%

3- What value of X makes these two cash flows equivalent assuming an interest rate of 8%?



a) 744 b) 645 c) 812 d) 703 e) 1000 f) 300

4- How many years will it take for an investment to double itself if the interest rate is 10% compounded annually?

a- 6.5 <N ≤ 7.5 years b- 7.5<N≤8.5 years c- 8.5<N≤9.5 years
d- 9.5<N≤10.5 years e- None of the above

5- What is the future worth of an equal quarterly payment series of $2,000 for 10 years, if the interest rate is 9%, compounded monthly?

a- F = $128,804 b- F = $120,804 c- F = $134,718 d- F = $160,058 e- F = $170,000

6- You have been offered a credit card by a department store that charges interest at 2.5% per month, compounded monthly. What is the effective annual interest rate for this credit card?

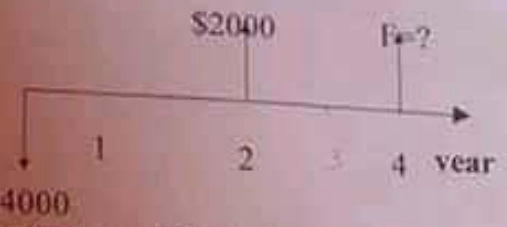
a- 18.00% b- 23.87% c- 34.49% d- 22.34% e- 20.09%

7- If you deposit $1,000 over three years at 8% annual interest, what is the interest earned in the 2nd year?

a- $86.4 b- $80.0 c- $98.10 d- $106.93 e- $200

Question 1: A

a- What is the value of F at 8% interest rate?



b- How long would it take for $200 to double if the interest rate is 6%?

Question 2

A loan of $50,000 is to be repaid in 8 equal end-of-year payments at 9%.

a- Find the value of the annual installments.

b- after 3 years, how much of the loan would be paid?

Question 3

a- What value of F3 would be equivalent to the payments shown in the cash flow diagram below? Assume that the interest rate is 10%, compounded annually.

b- Assume you deposited $10,000 in a savings account that pays 6%, compounded monthly. You wish to withdraw $200 at the end of each month. How many months will it take to deplete the balance?

Question 4

a- The current gasoline price is $4.15, and it is projected to increase next year by 5%, and 8% the following year, and -3% the third year. What is the average inflation rate for the projected gasoline price for the next 3 years?

b- You invested $100,000 in a project and received $40,000 at n = 1, $50,000 at n = 2, and $20,000 at n = 3 years. For some reasons, you need to terminate the project at the end of year 3. Your interest rate is 9%, what is the project balance at the time of termination?

6. Energy is the capacity to cause change.

7. Heat or is kinetic energy associated with the random movement of atoms or molecules. thermal energy.

8. The Enzyme is a chemical agent that speeds up a reaction without being consumed by the reaction.

9. A restrict region of the enzyme molecule actually binds to the substrate this region called the active site.

10. [illegible] is the ionized forming citric acid, for which the citric acid cycle is named.

9. Osmosis is the ability of a solution to cause a cell to gain or lose of water.

10. Microfilaments, internal filament and microtubules called [illegible] intermediate filament

(8 points) Q. 2. What is the main differences between animal cell and plant cell.

Animal cell	Plant cell
has a flagella	has a cell wall
has a centrioles	has chloroplasts
has lysosomes	has central vacuole

(4 points) Q.3 What is the difference between amylopasts and chromoplast?

1. Amylopasts: non-pigmented organites — Storage

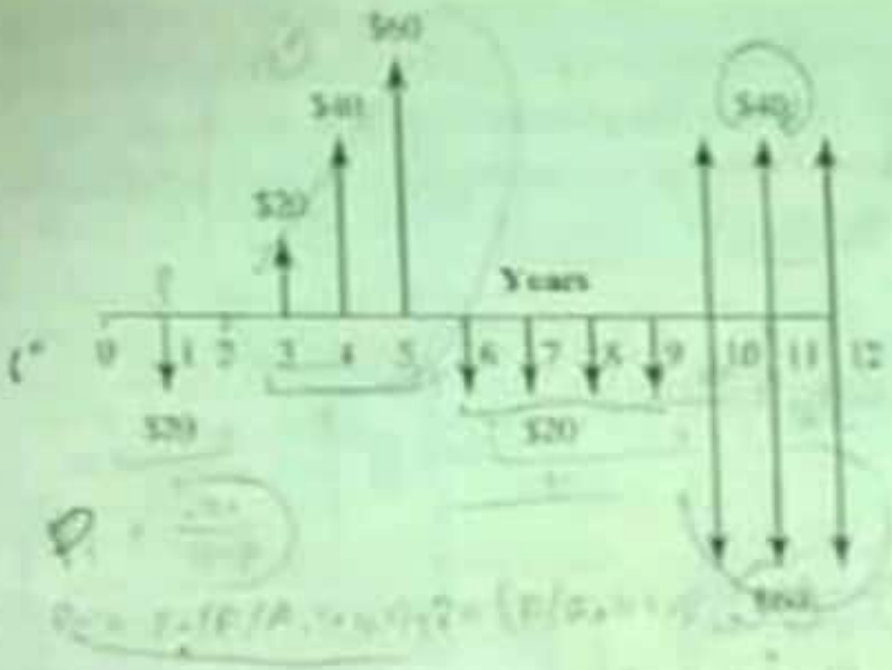
2. Chromoplasts: Coloured orange or yellow pigment.

(3 points) Q.4 What is the main function of smooth endoplasmic reticulum (SER)?

The end

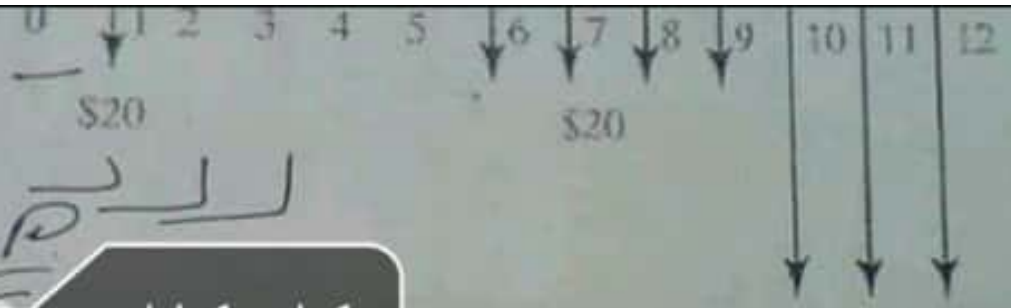
Question one (4 Marks)

Solve for the present worth of the cash flow shown in the accompanying diagram, using at most three interest factors at 10% interest compounded annually



Question Two: (4 Marks)

Five annual deposits in the amounts of $ 2500, $2000, $1500, $1000, $500 are made into a fund that pays interest at a rate of 9% compounded annually. Determine the amount in the fund immediately after the fifth deposit



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