

Name: \_\_\_\_\_

Registration# \_\_\_\_\_



Department of Computer Systems Engineering  
University of Engineering & Technology  
Peshawar, Pakistan

Dated: March 11<sup>th</sup>, 2022

Subject:	Engineering Economics
Exam:	Final Term
Marks:	60
Time Allowed:	3 Hours

1. Be clear and precise in your answers. Avoid unnecessary details.
2. You are expected to have brought a calculator and necessary stationery only, anything else found in possession would be tantamount to cheating.
3. No sharing of calculators is allowed during the exam.
4. Assume 1 dollar = 180 Rupees and Draw cash flows wherever required.
5. Pages are numbers from 1- 2. Make sure you have all of them.

**Question 01 [Marks 10]****[CLO-2]**

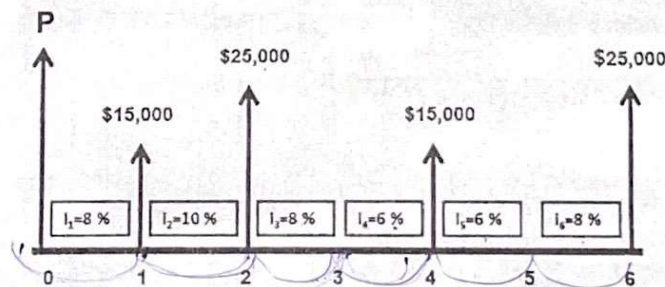
Microsoft Inc. lends promotional **\$12,570,000** for student projects at the local colleges. The loan must be returned at an **8%** interest rate compounded annually. Repayment should be made in such a way that an amount **A** must be paid for the first **8 years**, amount **3A** for the next **5 years**, and amount **5A** for the remaining years, keeping the interest rate **8%**. The total time for which the loan is allotted is **20 years**. Evaluate the value of **A**?

**Question 02 [Marks 10]****[CLO-3]**

Little Justin is given an **\$86,700** amount by a student scholarship that he aims to put in a saving account. Justin's father wants to choose three different offers provided by the saving institutions i.e.: (a) **5.375%** compounded annually for **5 years**, (b) **5.125%** compounded quarterly for **32 quarter years (8 years)**, (c) **5.175%** compounded monthly for **48 months (4 years)**, and (d) **5.325%** compounded continuously for **3 years**. He wishes to select the saving account that will give him the highest return on his investment. Which package should he select and why?

**Question 03 [Marks 10]****[CLO-2]**

- a. Solve the following cash flow for P:



- b. Mr. Kamran had some savings that he placed in a bank account ten years ago. He earned an amount of **\$2,968,000** from an initial investment at the end of **11 years**.

$$1280817$$

$$A = P \left( \frac{(1+i)^N - 1}{(1+i)^N - 1} \right)$$

$$\frac{(1+i)^N - 1}{(1+i)^N - 1}$$

The investment plan he chose was such that it earned an interest of 6.5% for the first three years, 4.5% for the next two years, 7.4% for the next four years and 8% for last two years. He also made a withdrawal of Rs. 990,000 at the end of year 5. Draw the cash flow for this scenario and evaluate the initial investment that Mr. Kamran had made.

**Question 04 [Marks 15]**

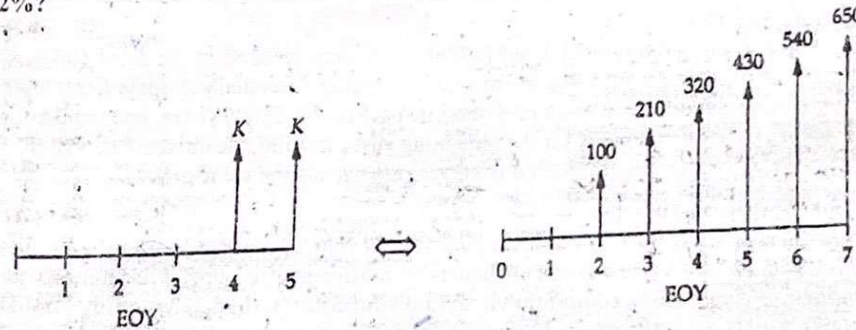
[CLO-2]

Alkaram is planning to invest in a shopping mall near the industrial estate of Karachi. The initial investment includes land costs \$500,000, working capital \$650,000, building costs \$550,000 and other materials required costs \$250,000. It is expected that the sales of the mall will reach up to \$600,000 per year for 12 years. At this time the land can be sold for \$500,000, the building for \$250,000, the materials for \$60,000 and all the working capital (\$650,000) will be recovered (Salvage values). The annual expenses for the labor and other items will sum up to \$435,000 per year. If the investment MARR is 9%, determine if this investment in the mall is worth it? Use AW method to support your argument.

**Question 05 [Marks 15]**

[CLO-3]

For what value of K will the following cash flows be equal for an interest rate equal to 12%?



Good Luck

$$(P/G, i, N) = \frac{(1+i)^N - iN - 1}{i^2(1+i)^N}$$

$$(A/G, i, N) = \left[ \frac{1}{i} - \frac{N}{(1+i)^N - 1} \right]$$

$$(F/G, i, N) = \frac{1}{i} (F/A, i\%, N) - \frac{N}{i}$$

$$CR(i\%) = I(A/P, i\%, N) - S(A/F, i\%, N)$$

$$CR(i\%) = (I - S)(A/F, i\%, N) + I(i\%) \quad CR(i\%) = (I - S)(A/P, i\%, N) + S(i\%)$$