Name: _____   Registration# _____

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

Dated: January 31, 2020

| Subject:	**Engineering Economics**
Exam:	**Final Term**
Weightage:	**60 %**
Time Allowed:	**2 Hrs**

Read the following instructions:

1. Be clear and precise in your answers. **Do NOT include unnecessary details.**
2. You are expected to have brought calculator and necessary stationary only, anything else found in possession would be tantamount to cheating. **No sharing of calculators is allowed during exam.**
3. Consider 1dollar =155 Rupees wherever required. Draw cash flows wherever required.
4. Pages are numbered from 1 of 4 to 4 of 4. Make sure you have all of them
5. You can use the interest table attached for help in some questions; Yet you must write the formula and expressions for the interest factor used and also do the calculations.

## Question 01: Short Questions.   [Marks 20]

1. Evaluate the **range of profitable demand** for a new project by **EWALL Pvt. Ltd.** The variable cost (c_v) per unit item of particular electronic component is **$750**, the intercept on price **(a)** is **2500** and negative slope **(b)** is **50** and the fixed costs (C_F) sums up to **$7,300** per month.

2. For what value of **V** will the following cash flow be equivalent for interest rate equal to **9%**? [CLO-3]

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

$79\,\text{CG}$

$T_P \; \ddagger_q$

$E = A(F/A)$

0 1 2 3 4 5 6 7 8 9 10 25   V=?

$2,500
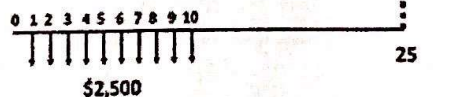
3. Find **G** in terms of **H** if the following cash flows are equivalent at **8%** interest rate. [CLO-2]

0 1 2 3 4 5 6 7 8 9 10 25

G

0 .... 16 17 18 19 20 21 22 23 24 25

H
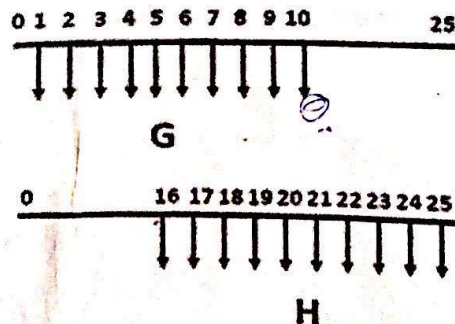
4. What is the Effective Interest Rate (EIR) for a scenario where $23,000 has to be repaid after **5 years** with a nominal interest rate (APR) of 13.5% compounded continuously?

5. Given the interest rate of 8%, evaluate the correct expression for given cash flow at N=0. Draw cash flow(s) for your solution. **[CLO-3]**

$e^r - 1$

$e^r - 1$

InJC

[CLO-2]
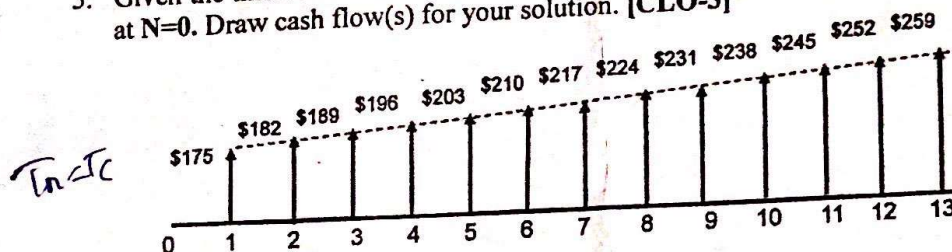
Question 02 [Marks 10]

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. 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/tenth year. He also made a withdrawal of Rs. 85,25,000 at year 5. Draw the cash flow for this scenario and evaluate the initial investment that Mr. Kamran had made.

[CLO-3]

Question 03 [Marks 20]

I ↑   RJ

Bahria Orchard is establishing a **sugar mill** with the resources from its estate business. The initial investment required for the sugar mill is land costs of **$150,000**, raw material of **$250,000**, working capital of **$760,000**, construction costs of **$650,000** and estimated hidden costs of **$300,000**. It is expected that the revenue from the mill will reach up to **$1,050,000** per year. The annual expenses for labor, electricity, fuel and other items will sum up to **$375,000** per year. The raw materials worth **$150,000** and the hidden costs worth **$250,000** remains unused by the end of **15 years** (Hint: Salvage values). If the company requires an **MARR** of 9% on return, determine if it should invest in this mill? Use **AW** method to support your argument. Verify your argument using **PW** or **FW** method.
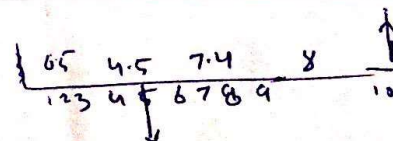
Question 04 [Marks 10] bro?

The Government Treasury Bond that matures in 10 years has a face/Par value of **$20,000** and earns at the rate of **5%**. If the yield rate applied is **8%** compounded quarterly; How much is the worth of this bond at present time in order to buy this bond?

$F = A\left[\dfrac{(1+i)^N - 1}{i}\right]$

Good Luck

$\begin{cases} 6.5 & 4.5 & 7.4 & 8 \\ 123 & 45 & 6789 & 10 \end{cases}$ ↑

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

$AW(i\%) = R - E - CR$

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