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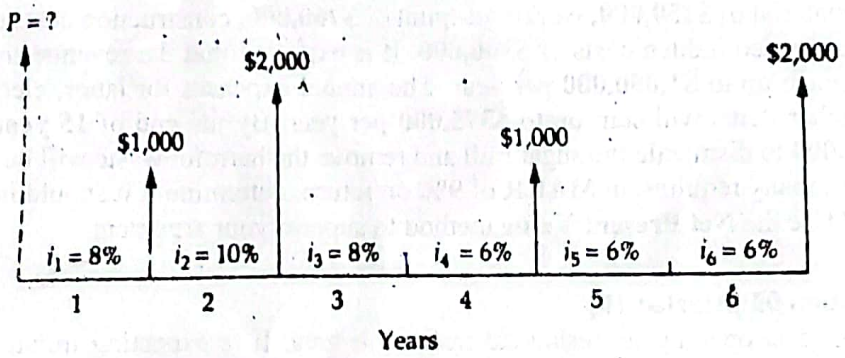
Subject:	**Engineering Economics**
Exam:	**Final Term**
Weightage:	**60 %**
Time Allowed:	**2 Hrs**

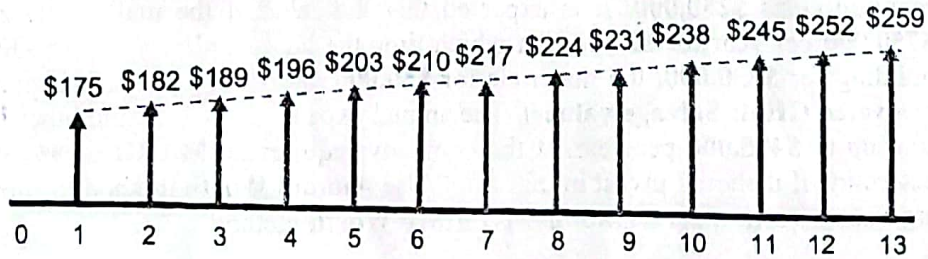
Part A: Short Questions: [Marks: 10]

1. The correct expression for finding P is:



2. An investment of **$10** is made for **1 year** at **18%** interest rate compounded **monthly.** The interest earned after **3 years** will be:

3. The correct expression for given cash flow at **N=13** is:



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4. An investment of **$57,800** in equipment has yearly profit of **$25,000** for **6 years** at an MARR of **9%.** At the end its salvage value becomes **$17,600.** Its value for **CR (9%)** will be?
5. For what value evaluated by annual worth method of various projects you will choose if you want to earn from your investment?
6. The condition for a project to be economically sound in terms of MARR is?

Part B: Long Questions [Marks: 50]

(Draw cash flow diagrams with all the questions)

Question 01 [Marks 20] **[CLO-3]**

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. By the end of **15 years** a cost of **$300,000** to dismantle the sugar mill and remove the harmful waste will be incurred. If the company requires an **MARR** of **9%** on return, determine if it should invest in this mill? Use the **Net Present Value** method to support your argument.

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

Mr. Cod is opening its restaurant near cantt area. It is expecting initial revenue of **$72,000** per year with an annual increase of about **$400** as per statistics. The initial investment required for the restaurant is **$170,000** and MARR per year is **8%**. The yearly expenses are expected to reach around **$35,000**. Find out if this income is large enough to cover the investment for a study period of **15 years**.

Question 03 [Marks: 20] **[CLO-3]**

Nike is constructing a mall near industrial estate. The initial investment includes land costs **$400,000**, working capital **$560,000,** building costs **$600,000** and other materials required costs **$250,000.** It is expected that the sales of the mall will reach up to **$750,000** per year for **12 years** at which time the land can be sold for **$500,000,** the building for **$350,000,** the materials for **$50,000** and all the working capital will be recovered **(Hint: Salvage values)**. The annual expenses for labor and other items will sum up to **$475,000** per year. If the company requires an **MARR** of **9%** on return, determine if it should invest in this mall? Use **Annual Worth** method to support your argument. Verify your answer using **Future Worth** method.

Good Luck