

# Paper

## Department of Humanities and Social Sciences

Paper: Economics for Engineers

Time: (50 + 30) Minutes

Sessional Exam-I

Max Marks- 15

### General Instructions

- Mention your roll no. and put signature on each page of answer sheet
- Upload only pdf file having name in the format: **Section\_RollNo\_Name**. For ex. **CE\_05\_12017007\_Aayush**
- Upload the pdf file in section 3 of the form under your section heading only.
- Answer sheet may not be evaluated if above instructions are not followed.

**Attempt the following compulsory questions having equal marks.**

Q1). Chemical engineers at a Coleman Industries plant have determined that a small amount of a newly available chemical additive will increase the water repellency of Coleman's tent fabric by 20%. The plant superintendent has arranged to purchase the additive through a 5-year contract at \$7000 per year, starting 1 year from now. He expects the annual price to increase by (multiple of second and last number of your roll number plus 2) % per year starting in the sixth year and thereafter through year 13. Additionally, an investment of \$35,000 was made now and repeated every fifth year to prepare a site suitable for the contractor to deliver the additive. Determine the equivalent total present worth for all these cash flows using % MARR as sum of last two numbers of your roll number plus the second number of your roll no).

**An illustration of price increase for a random roll number- 12017007 is 16%. The MARR for same roll no. is 9%.**

Q2). A quarry outside of Austin, Texas wishes to evaluate two similar pieces of equipment by which the company can meet new state environmental requirements for dust emissions. The % MARR is sum of last two numbers of your roll number plus 1. Determine which alternative is economically better using the annual worth method.

Equipment	Machine A	Machine B
First Cost (\$)	26,000	36,000
Maintenance cost(\$) per year	800	300
Life (Years)	6	10
Salvage value (\$)	2,000	3,000
Annual labor cost(\$)	11,000 in year 1 and increasing by sum of last two numbers of your roll number every year thereafter	7,000 in year 1 and increasing by sum of first and last numbers of your roll number every year thereafter