4. A proposed chemical plant will require a fixed-capital investment of $ 10 million. It is estimated that the working capital will amount to 25 percent of the total investment, and annual depreciation costs are estimated to be 10 percent of the fixed capital investment. If the annual profit will be $ 3 million, determine the standard percent return of the total investment and the minimum payout period.

5. Discuss "Pay out period method" in detail. Also explain the different methods for profitability evaluation.





(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289575 Roll No.

# B.TECH

## Regular Theory Examination (Odd Sem.VII), 2016-17

## PLANT DESIGN & ECONOMICS

*Time : 3 Hours* *Max. Marks : 100*

**SECTION - A**

**1. Attempt all Section . Section A carry equal marks. Write answer of each in short. (10×2=20)**

a) What is fixed cost?

b) What is Break even point?

c) What is discount factor?

d) What Is Lang factor?

e) What is dumping?

f) What do you mean by scaleup?

g) Define startup.

h) What do you mean by battery limit?

i) Define plant layout.

j) Explain annuity term.

## Section - B

**2. Attempt any 5 questions from this section.** **(5×10=50)**

a) What are the methods of calculating depreciation? Explain any two methods.

b) What is present value method? How it is useful in comparing alternatives?

c) Discuss about the cash flow analysis.

d) A process plant has an initial investment of Rs. 50 lakhs. The estimated salvage value is Rs. 2 lakhs. It has a life of 8 years. Estimate the book value of the plant after 5 years by

i) Straight line depreciation method

ii) Declining balance method and

iii) Sinking fund method with a sinking fund interest rate of 10%.

e) A pump installation costing Rs. 2000 has a salvage value of Rs. 400. It requires Rs. 200 for its annual maintenance. If the value of the money is 10% and the pump has a life of 3 years, what is the present worth of service rendered by the pump? What is the capitalized assuming perpetual operation?

f) A boy is celebrating his sixteenth birthday and will need $3000 on his seventeeth, eighteenth,





nineteenth, and twentieth birthdays for his college education. His father agrees to set aside a certain amount now and each year thereafter until the boy is 20 years old; moreover, the contributions will form an arithmetical progression for all years, increasing by 20 percent after the first year. If money is worth 4% per year, what is the father's first contribution?

g) A bond has a maturity value of $ 1000 and is paying discrete compound interest at an effective annual rate of 3 percent. Determine the following at a time four years before the bond reaches maturity value:

i) Present worth

ii) Discount

iii) Discrete compound rate of effective interest which will be received by a purchaser if the bond were obtained for $ 700.

h) Explain with suitable examples, cyclic, semi-cyclic and variocyclic operations.

## Section - C

**Attempt any 2 questions from this section.** **(2×15=30)**

**3.** Give an optimization scheme, which may be followed for determination of optimum height and diameter of a sieve tray distillation column?