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B.E. (MBA AND FT) 4<sup>TH</sup> YEAR

SUBJECT: PROCESS ENGINEERING ECONOMICS

MST 1

M.M. 25

TIME ALLOWED: 60 MINUTES

Q1. (a) Why do we consider depreciation as cost?

(b) Write a note on working capital.

(c) Explain annuity? Derive an expression for an ordinary annuity? (3,3,4)

Q2. Fixed capital investment in a process plant is Rs. 75 lacs. Preoperative expenses are Rs. 5 lacs and working capital required is Rs. 25 lacs. Plant construction would take 1 year. Life of the plant is 5 years. Annual depreciation is 20% of the fixed capital investment. Preoperative expenses must also be recovered over the life of the plant. Annual profit after tax is Rs.40 lacs. Prepare the cash flow table and chart. (8)

Q3. An existing warehouse is worth \$500,000, and the average value of the goods stored in the warehouse is \$400,000. The annual insurance rate on the warehouse is 1.1 percent, and the insurance rate on the stored goods is 0.95 percent. If a proposed sprinkling system is installed in the warehouse, both insurance rates will be reduced to three-quarters of the original rate. The installed sprinkler system will cost \$20,000, while the additional annual cost of maintenance, inspection, and taxes will be \$300. The required depreciation period for the entire investment in the sprinkler system is 20 years. The capital necessary to make the investment is available. The operation of the warehouse is now providing an 8 percent return on the original investment. Give reasons why you would or would not recommend installing the sprinkler system. (7)