BE (FT) and Integrated BE (Chemical)- MBA 7th SEMESTER
Second Sessional (20-01-2022)
Process Engineering and Economics

Max Marks: 25   Time: 60 minutes

I.   (a) Describe in details about the Breakeven point analysis. (CO-4)   (3)
     (b) The annual variable production cost for plant operating at 50% capacity is Rs
     314000. Sum of all the charges that consist of Fixed cost is Rs 3 lakh. Product sells at
     Rs 5/kg and total annual sales are Rs. 660000. What is Breakeven point (in terms of
     units and sales) and Margin of safety. Also calculate the Gross annual profit and net
     annual profit for this plant at 70% capacity if income tax rate is 26%. (CO-4)   (5)

II. Calculate the Net Present Value (NPV) of the following project and state whether it is
     economical feasible to carry out the project. Following data is given for the project:
     Initial Fixed Capital Investment: Rs 200000
     Service life: 6 years
     Working Capital: Rs 8000
     Salvage value: Rs 15000
     Minimum acceptable rate of return: 20%   (7)
     Income tax return: 30%   (CO-4)

Year	Revenue after tax
1	34567
2	38789
3	79567
4	83456
5	85678
6	88956

III. What weight of installed stainless steel tank could have been obtained in 1998, if cost
      of stainless-steel tank of weight 300,000 lb in 1980 is Rs 670000. The installed
      cost weight exponent for stainless steel tank is 0.88 for a size range from 300000 to
      700000 lb. Investment cost of stainless-steel tank in 1998 for the specific weight is Rs
      4.24×10^6
      Cost index of stainless-steel tank (1980): 675
      Cost index of stainless-steel tank (1998): 1200   (CO-2)   (5)

IV.   Find out the optimum diameter of a cylindrical storage vessel of volume 583 m^3, if the
      curved shell cost (Cs) is Rs 105.2/cm^2 and the flat top-bottom plates cost (Cp) is Rs
      214.8/cm^2. (CO-3)   (5)