

GUJARAT TECHNOLOGICAL UNIVERSITY**Diploma Engineering - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 360503****Date: 28-11-2014****Subject Name: Chemical Engineering Plant Economics****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

- Q.1** (a) List items that should be considered in making a feasibility survey. Explain any one in detail. **07**
- (b) Define: (i) Unamortized cost (ii) Obsolescence (iii) Appraised depreciation (iv) Depletion (v) Cost index (vi) Turn- over ratio (vii) Junk value **07**
- Q.2** (a) Original price of an evaporator is Rs. 50 lakhs, completely installed and ready for use. Due to corrosive salt brines used, its economic life is estimated to be only 6 years. Its salvage value is estimated to be only Rs. 8 lakhs at the end of service life. **07**
- Calculate the book value at the end of 5 years using :
1. Straight line method
 2. Fixed percentage method
 3. Sum of the years digits method
- (b) Discuss the plant design factors in detail. **07**
- OR**
- (b) Write a short note on principles of plant lay out. **07**
- Q.3** (a) Discuss with illustrated figures mathematical methods for profitability evaluation of an investment in a project. **07**
- (b) Write a short note on factors to be considered in selection of material handling equipment. **07**
- OR**
- Q.3** (a) Mention the different methods for evaluation of depreciation and discuss Sinking fund method in detail **07**
- (b) Describe the procedure for determining optimum condition with one variable (analytical and graphical) **07**
- Q.4** (a) Mention the various methods for plant lay out and discuss two dimensional lay out in detail. **07**
- (b) Write a specification sheet for sieve tray column **07**
- OR**
- Q. 4** (a) Discuss Standard v/s special equipment. **07**
- (b) Brief note Piping lay out rules and piping design problems **07**
- Q.5** (a) The annual variable production costs for a plant operating a 70% capacity are Rs.2, 80,000. The sum of annual fixed charges, overhead costs, and general expenses Rs. 2, 00,000. And may be considered not to change with production rate, the total annual sales are Rs. 5, 60,000 and the product sells for Rs.4 /Kg. what is breakeven point in kilograms of product per year? What are the gross annual profit and net annual profit for this plant at 100 percent capacity if the income tax rate is 35 % of gross profit? **07**

(b) List out types of flow diagrams and explain any one in detail. **07**

OR

- Q.5** (a) The purchased cost of shell and tube heat exchanger with 100 sq. ft of heating surface was Rs.48000. What will be the purchased cost of a similar heat exchanger with 200 sq. ft in 1960? If the purchased cost –capacity exponent for this type of heat exchanger is 0.81 for surface areas ranging from 4000 to 2000 sq.ft, what will be the purchased cost of heat exchanger with 1000 sq.ft of heating surface in 1960 and 1966. (Note: Take Marshall & Steven equipment cost index in 1966 as 248.5) **07**
- (b) Give break up of manufacture cost in a chemical plant and classify them in groups. **07**
