

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2170503****Date: 26/11/2018****Subject Name: Plant Design & Project Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
<b>Q.1</b>	(a) Define “Pilot Plant”. Discuss about its importance in chemical Industries.	<b>03</b>
	(b) Differentiate between standard v/s special equipment.	<b>04</b>
	(c) State and discuss the important factors to be considered in selection of the location of a chemical plant.	<b>07</b>
<b>Q.2</b>	(a) Define the following :	<b>03</b>
	(i) Book value	
	(ii) Salvage Value	
	(iii) Cost Indexes	
	(b) Using diagram explain break- even point analysis and its importance.	<b>04</b>
(c) The original value of cyclone separator is Rs. 32,000/- and its salvage value is Rs. 2000/-. The service life is estimated to be 7 years. Determine the asset value at the end of 5 years using	<b>07</b>	
(a) Straight line method.		
(b) Text Book declining method		
(c) Double declining balance method		
(d) Sum of the years digit method		
<b>OR</b>		
(c)	The annual direct production cost of plant operating at 60% capacity is Rs.1,20,00,000/-. While the sum of annual fixed charges, overhead cost and general expenses is Rs.1,00,00,000/-. What is the breakeven point in units of production per year if total annual sales are Rs.2,80,00,000/- and the product sells at Rs.2000/- per unit? What were the annual gross earnings and net profit for this plant at 100% capacity if the income tax rate is 22% of gross earnings?	<b>07</b>
<b>Q.3</b>	(a) Discuss about “Scale model”?	<b>03</b>
	(b) Discuss about the components involved in techno-economical feasibility report.	<b>04</b>
	(c) Discuss the preliminary specifications for any chemical equipment. Prepare a specification sheet for a distillation column.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Discuss any three safety aspects to be considered in a chemical plant project.	<b>03</b>
	(b) Discuss types of flow diagrams in detail.	<b>04</b>
	(c) Discuss in brief about process utilities and its importance in chemical industry.	<b>07</b>
<b>Q.4</b>	(a) Discuss basic factors involved in plant design.	<b>03</b>
	(b) Define plant Layout. List out factors to be considered for an efficient	<b>04</b>

- plant layout.
- (c) Discuss the selection criteria of valves. Name commonly used pipe fittings and valves with their main functions. **07**

**OR**

- Q.4** (a) Define followings: **03**  
 (i) Working Capital Investment  
 (ii) Turnover Ratio  
 (iii) Payout period
- (b) Enlist different methods for estimating capital investment. Explain Unit Cost estimate method in detail. **04**
- (c) Discuss cash flow with tree diagram for an industrial organization. **07**
- Q.5** (a) What do mean by “Alternative Investments”? Enlist various method of profitability Analysis. **03**
- (b) List out costs involved in Direct and Indirect Cost. **04**
- (c) Discuss the method for evaluation of total product cost showing the individual components **07**

**OR**

- Q.5** (a) What is ”Bar Chart”? List out limitations of Bar chart. **03**
- (b) Differentiate between C.P.M and P.E.R.T **04**
- (c) An equipment consists of three parts A, B and C. These are assembled together after manufacture. Part A is of cast iron which requires a pattern and a module, Part B is to be machined on a special machine and hence special machine is to be purchased and erected. Part C needs special heat treatment before assembly. The assembly has to be tested with a specially fabricated ring before dispatch. The time needed by each activity is given below. Draw the Bar chart. **07**

No.	Activity	Days
1	Preparing pattern for casting Part A	5
2	Preparing mould for Part A	1
3	Casting and clearing of A	2
4	Heat treatment of C	2
5	Obtaining and installing machine M	8
6	Machining part B	3
7	Assembly Parts A, B and C	3
8	Preparing test ring	4
9	Testing assembly	1
10	Packing and dispatch	1
Total		30 days

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