

CBGS SCHEME

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15BT654

Sixth Semester B.E. Degree Examination, June/July 2018 Economics and Plant Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. What are the different types of design used in a plant? Explain the factors to be considered in the detailed estimation of plant design. (10 Marks)
- b. Elaborate on the following:
- i) Scale-up in design (03 Marks)
- ii) Material of construction. (03 Marks)

OR

- 2 a. Briefly explain the factors to be considered in comparison of different processes involved in a plant design. (06 Marks)
- b. Elaborate on the factors to be considered in general design consideration of a plant. (10 Marks)

Module-2

- 3 a. Elaborate on the different costs to be considered in fixed and working capital estimation. (10 Marks)
- b. Briefly explain the factors involved in project cost estimation. (06 Marks)

OR

- 4 a. Determine the costs involved in plant overhead to be considered for a plant design. (10 Marks)
- b. Write a note on the factors to be considered for manufacturing cost. (06 Marks)

Module-3

- 5 a. Elaborate on the methods employed for the estimation of the capital investment. (06 Marks)
- b. A bond has a maturity value of Rs.1000 is paying compound interest at the rate of 3%. Determine the following at a time 4 years before the bond reaches maturity:
- i) Present worth
- ii) Discount
- iii) Compound interest rate which will be received by purchaser of the bond were obtained for Rs.700/-
- iv) Find the present worth where the nominal bond interest is compounded continuously. (10 Marks)

OR

- 6 a. Two machines have the following data. Determine which machine is more economical from present worth analysis:

Item	Machine A	Machine B
Initial cost	6000	3000
Annual maintenance cost	2000	1000
Salvage value	1500	500
Service life	6 years	6 years
Income from product every year	1500	1250
Interest	30%	30%

(10 Marks)

- b. It is desired to borrow Rs.1000/- to meet a financial obligation. This money can be borrowed from a loan agency at a monthly interest rate of 2%.

Determine the following:

- The total amount (or) principal + simple interest due after 2 years.
- The total amount of principal + compound interest due after two years.
- The nominal interest rate when the interest is compounded monthly for one year.
- The effective interest rate when the interest is compounded monthly for one year.

(06 Marks)

Module-4

- 7 a. Define depreciation. List out the different methods of finding depreciation. Elaborate on any four methods. (06 Marks)
- b. A machine is purchased for Rs.1,00,000 and its estimated life is 5 years with negligible scrap value. If the rate of interest on depreciation fund is 6%, calculate the rate of depreciation by the following methods and compare the results:
- Straight line method
 - Sum of year digit method
 - Sinking fund method.

(10 Marks)

OR

- 8 a. A chemical manufacturer buys an equipment for Rs.10,00,000 that has an estimated salvage value of Rs.2,00,000. If the life for tax purpose is 10 years. Find the book value after 6 years by the following methods:
- Straight line method
 - Declining balance method.
- (10 Marks)
- b. Find the depreciation by the annuity charging method after three years, when the cost of the machine is Rs.8000, scrap value is 4000 and rate of interest is 5% calculate the value of machine after two years. (03 Marks)
- c. A bulldozer is purchased for Rs.80,000. Its estimated life is 10 years and the scrap value is Rs.20,000. If the depreciation charge is according to diminishing balance method. Determine the percentage by which the value of bulldozer should be depreciated every year and also evaluate the value of depreciation fund after two years. (03 Marks)

Module-5

- 9 a. Define profitability analysis. Elaborate on the methods of evaluation of profitability. (10 Marks)
- b. A project can produce 12,000 units per year at 100% capacity. The variable cost per unit is Rs.3 upto 100% capacity. Fixed costs are Rs.10,000 per year. Find the break even point if the selling price is Rs.5 per year. Now the manufacturer finds that he can sell only 80% at Rs.5 per unit. How much should he charge for additional unit if he brings production upto 100% capacity and increase profits after taxes by an additional Rs.1000. The tax rate is 52%. (06 Marks)

OR

- 10 A company has three alternative investments which are being considered. Because all three investments are for the same type of unit and yield the same services only one of the investments can be accepted. The risk factors are the same for all three cases. Company policies based on the current economic situation dictate that a minimum annual return on the original investment of 15% after taxes must be predicted for any unnecessary investment with interest on investment not included as a cost. Company policies also dictate that where applicable, straight line depreciation is used and for time value of money interpretations, end of year cost and profit analysis is used. Land value and prestart up costs can be ignored. Given the following data, determine which investment, if any, should be made by alternative analysis profitability evaluation methods of,
- Rate of return on initial investment.
 - Minimum period with no interest.
 - Capitalized cost.

Investment no.	Fixed capital investment	Working capital	Salvage value	Service life (years)	Annual cash flow	Annual cash expenses
1	1,00,000	10,000	10,000	5	See yearly table	44,000
2	1,70,000	10,000	15,000	7	52,000	28,000
3	2,10,000	15,000	20,000	8	59,000	21,000

Yearly Table: For investment number 1 investment 1:

Variable cash flow	Year
30,000	1
31,000	2
36,000	3
40,000	4
43,000	5

(16 Marks)

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