

JEPPIAAR ENGINEERING COLLEGE

Jeppiaar Nagar, Rajiv Gandhi Salai – 600 119

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK



VII SEMESTER

MG6863 – Engineering Economics

Regulation – 2013



JEPPIAAR ENGINEERING COLLEGE

Jeppiaar Nagar, Rajiv Gandhi Salai – 600 119
DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

SUBJECT : MG6863 – Engineering Economics
YEAR /SEM: IV /VIII

UNIT I INTRODUCTION TO ECONOMICS				
Introduction to Economics- Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio, Elementary economic Analysis – Material selection for product Design selection for a product, Process planning.				
PART – A				
CO Mapping :				
Q.No	Questions	BTL Level	Competence	PO
1	What is elasticity of Demand? (April/May2008)	BTL 1	Remembering	PO11
2	Define the term `cost`? (April/May 2017) (April/May2015) (May /June 2016)	BTL 1	Remembering	PO11,PO12
3	What is opportunity cost? (April/May2008) (Nov/Dec 2008) (May /June 2013)	BTL 1	Remembering	PO11,PO12
4	What do you mean by marginal cost? (Nov/Dec 2016)	BTL 1	Remembering	PO11
5	Explain marginal costing? (Nov/Dec 2016)	BTL 5	Understanding	PO11
6	What is meant by marginal revenue? (Nov/Dec 2015)	BTL 1	Remembering	PO11
7	Give a short note on sunk cost? (May /June 2012)	BTL 1	Remembering	PO11, PO12
8	List out the elements of cost?	BTL 1	Remembering	PO1, PO12
9	Define the term costing?	BTL 1	Remembering	PO11,PO12
10	What is Break-even point? (Nov/Dec 2013)	BTL 1	Remembering	PO1,PO11,PO 12
11	Define P/V ratio. (May/June 2013)	BTL 1	Remembering	PO1,PO12
12	Differentiate “technical efficiency and economic efficiency” (Nov/Dec 2013)	BTL 4	Analyze	PO1,PO2,PO1 2
13	write down the disadvantages large scales production (Nov/Dec 2012)	BTL 2	Understanding	PO11,PO12
14	list out the scope of economics (Nov/Dec 2012)	BTL 1	Analyze	PO1, PO12
15	what are the types of consumption(April/May2010)	BTL 1	Remembering	PO1,PO11,PO 12
16	State the Law of Demand. (Nov/Dec 2009)	BTL 1	Understanding	PO1, PO11
17	what is diversification of marketing (Nov/Dec 2009)	BTL 1	Remembering	PO1,PO11,PO 12
18	What are the main areas of application of managerial economics	BTL 1	Remembering	PO1,PO12
19	State the sources of wants	BTL 1	Understanding	PO1, PO11
20	Differentiate wealth and money	BTL 4	Analyze	PO1,PO11
21	what is the form of utility	BTL 1	Remembering	PO11,PO12
22	Give examples for wealth and wants	BTL 1	Remembering	PO1, PO12
23	Define law of diminishing marginal utility	BTL 1	Remembering	PO1, PO11
24	list out the advantages of small scale production	BTL 1	Remembering	PO12

25	What are kinds of external economics	BTL 1	Remembering	PO1,PO12
26	What are factors determined internal economics	BTL 1	Remembering	PO11, PO1
27	Describe price theory	BTL 2	Evaluating	PO11
28	What is the basis of taxations	BTL1	Remembering	PO11
29	What is consumption	BTL 1	Remembering	PO1,PO12
30	Write down the types of capitals	BTL 1	Understanding	PO11

PART – B				
1	Bring out the scope of Engineering economics with appropriate example. (Nov/Dec 2016) (April/May2017)	BTL 2	Understanding	PO1,PO11
2	Explain in detail about flow in an economy. (Nov/Dec 2016)	BTL 5	Evaluate	PO11,PO12
3	Briefly explain about element of cost and its classification?	BT 5	Evaluate	PO12
4	Discuss opportunity and describe process planning. (April/May2017)	BTL 6	Create	PO12
5	Discuss the nature and scope of managerial economics (May/ June 2013)	BTL 6	Create	PO11,PO12
6	Explain how managerial economics helps in solving managerial problems (May/ June 2013)	BTL 5	Evaluate	PO1,PO12
7	Explain the following a) Micro economics b) Macro economics c) Normative economics d) Positive economics (May/ June 2013)	BTL 5	Evaluate	PO1,PO12
8	Discuss the scope of Engineering economics with NANO technology as a new science introduced in the industry (Nov/Dec 2008)	BTL 6	Create	PO11, PO12
9	Enumerate the concept of extension and contraction in demand (April / May 2011)	BTL 2	Understanding	PO1
10	Differentiate monopoly from monopolistic competition. (April / May 2011)	BTL 4	Analyze	PO1,PO12
11	What is demand forecasting? Explain any four method of forecasting. (April / May 2011)	BTL 1	Remembering	PO12
12	Explain the factors influencing demand and supply. (Nov/Dec 2013)	BTL 5	Evaluate	PO12, PO1

UNIT II VALUE ENGINEERING				
Make or Buy decision, Value engineering – Function, aims, Value engineering procedure. Interest formulae and their applications –Time value of money, Single payment compound amount factor, Single payment present Worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factor-equal payment series capital recovery factor-Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.				

PART – A				
CO Mapping : C214.2				
Q.No	Questions	BT Level	Competence	PO
1	What do you mean by `Make or Buy Decisions?	BTL 1	Remembering	PO6, PO7
2	What are the different approaches followed in make or buy decision?	BTL 1	Remembering	PO4,PO6
3	What is mean by value analysis/value engineering?	BTL 1	Remembering	PO4, PO6
4	What do you mean by value of a product?	BTL 1	Remembering	PO4
5	Explain `function`.	BTL 5	Evaluate	PO6
6	What are the different types of values?	BTL 1	Remembering	PO6,PO7
7	What are the various functions of a product?	BTL 1	Remembering	PO4,PO6
8	Write any four objectives of value analysis.	BTL 2	Understanding	PO4,PO7
9	List any four advantage of value engineering.	BTL 2	Understanding	PO4,PO7
10	Explain concept of discounting (Nov/Dec 2009)	BTL 5	Evaluate	PO4,PO7
11	What is value engineering?	BTL 1	Remembering	PO4,PO7
12	Write any four aims of value engineering	BTL 2	Understanding	PO4,PO7
13	what is meant by cash flow diagram	BTL 1	Remembering	PO4,PO7
14	write down the	BTL 2	Understanding	PO4, PO6

	general principal of economics equivalent calculations			
15	List out the method for calculating interest payment	BTL 1	Understanding	PO6, PO7
16	Mention any two criteria for buy decision.	BTL 4	Analyzing	PO6, PO7
17	What is simple interest?	BTL 1	Remembering	PO6, PO7
18	List out the benefits of value engineering.	BTL 1	Remembering	PO6, PO7
19	Write note on equal payment series sinking fund.	BTL 1	Remembering	PO6, PO7
20	Write a note single payment present worth amount.	BTL 1	Remembering	PO6, PO7
21	How effective interest rate is calculated?	BTL 1	Remembering	PO6, PO7
22	what is time value of money?	BTL 1	Remembering	PO6, PO7
23	Techniques / approaches of make or buy decision.	BTL 4	Analyzing	PO6, PO7
24	What is economic analysis?	BTL 1	Remembering	PO6, PO7

PART – B

1	What are all the function aims of value engineering discuss the value engineering procedure.(Nov/Dec 2009)	BTL 1	Remembering	PO6, PO7
2	What is time value of money? How is it useful in taking investment related decision? (Nov/Dec 2009)	BTL 1	Remembering	PO6, PO7
3	Compute the present value of Rs. 1000 receivable 6 years hence if the rate of discount is 10 percent? (Nov/Dec 2009)	BTL 5	Evaluating	PO4, PO6, PO7
4	Explain in detail about criteria for make or buy decision and its approaches (Nov/Dec 2016)	BTL 2	Understanding	PO6, PO7
5	Explain problems in single payment present worth factor(Nov/Dec 2016)	BTL 5	Evaluating	PO4, PO6, PO7
6	Discus make or buy decision and explain value engineering procedure (April/May 2017)	BTL 4	Analyzing	PO6, PO7
7	Describe the function and aims of value engineering (April/May 2017)	BTL 1	Remembering	PO6, PO7
8	A company has to replace an asset after 10 years at an outlay of Rs. 5 lakes it planes to deposits an equal amount at the end of every year for next year at an annually compounded interest of 20% Find the equivalent amount to be deposited at the end of every year for the next 10 year. (April/May 2017)	BTL 1	Remembering	PO4, PO6, PO7
9	Explain the factor governing elasticity of demand.	BTL 5	Evaluating	PO6, PO7
10	How will you measure elasticity of demand. Illustrate how do you interpret the different types of elasticity.	BTL 1	Remembering	PO6, PO7
11	Explain how supply and demand determine the equilibrium price. What happens if the supply curve shift to the left?	BTL 5	Evaluating	PO6, PO7

UNIT III CASH FLOW

Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), Annual equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.

PART – A

CO Mapping : C214.3

Q.No	Questions	BTL 1	Competence	PO
1	What is revenue dominated cash flow?	BTL 1	Remembering	PO11

2	What is cost of dominated cash flow?	BTL 1	Remembering	PO11
3	Mention the various rate of return method.	BTL 4	Analyzing	PO11
4	What is rate of return?	BTL 1	Remembering	PO11
5	What is present worth method?	BTL 1	Remembering	PO11
6	Limitations of cash flow analysis?	BTL 4	Analyzing	PO11
7	Draw revenue – dominated cash flow diagram for present worth method.	BTL 6	creating	PO11
8	Draw cost – dominated cash flow diagram for present worth method.	BTL 1	creating	PO11
9	Consider the following cash flow series over a 10 years. Assuming the interest rate as 12% compounded annually. Compute the present worth series. Express your comments.	BTL 4	Analyzing	PO11
10	Take the following cash flow diagram. Find the present worth, take $i = 15%$ annually	BTL 1	Remembering	PO11
11	Determine the future worth method by assuming interest rate of 10%, for the given diagram. Add your comment.	BTL 5	Evaluating	PO11
12	Determine the future worth method by assuming interest rate of 10% for the given diagram. Add your comment	BTL 5	Evaluating	PO11
13	A person deposits a sum of Rs 20,000 at the interest rate of 18% compounded annually for 10 years. Find the maturity value after 10 years.	BTL 1	Remembering	PO11

PART – B

1	Explain in detail about future worth method (Revenue dominated cash flow diagram)	BTL 2	Understanding	PO11																
2	(i)How would you describe the revenue dominated cash flow diagram? (ii)Explain present worth method.	BTL 1	Remembering	PO11																
3	<p>A company invests in one of the two mutually exclusive alternatives. The life of both alternatives is estimated to be 5 years with the following investment, annual returns & salvage values.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Alternative</th> </tr> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>Investment(Rs)</td> <td>-1,50,000</td> <td>-1,75,000</td> </tr> <tr> <td>Annual equal return (Rs)</td> <td>60,000</td> <td>70,000</td> </tr> <tr> <td>Salvage value (Rs)</td> <td>15,000</td> <td>35,000</td> </tr> </tbody> </table> <p>Determine the best alternative based on the annual equivalent method by assuming $i=25%$.</p>		Alternative		A	B	Investment(Rs)	-1,50,000	-1,75,000	Annual equal return (Rs)	60,000	70,000	Salvage value (Rs)	15,000	35,000	BTL 2	Understanding	PO11		
	Alternative																			
	A	B																		
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4	<p>i) A company has three proposals for expanding its business operations. The details are as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Alternative</th> <th>Initial cost</th> <th>Annual revenue</th> <th>Life(years)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>25,00,000</td> <td>8,00,000</td> <td>10</td> </tr> <tr> <td>B</td> <td>20,00,000</td> <td>6,00,000</td> <td>10</td> </tr> <tr> <td>C</td> <td>30,00,000</td> <td>10,00,000</td> <td>10</td> </tr> </tbody> </table> <p>Each alternative has insignificant salvage value at the end of its life. Assuming an interest rate of 15% compounded annually, find the best alternative for expanding the business operations of the company using the annual equivalent method.</p> <p>ii) How would you understand the concept of Annual Equivalent Method? (Revenue Dominated Cash Flow Diagram)</p>	Alternative	Initial cost	Annual revenue	Life(years)	A	25,00,000	8,00,000	10	B	20,00,000	6,00,000	10	C	30,00,000	10,00,000	10	BTL 3	Applying	PO11
Alternative	Initial cost	Annual revenue	Life(years)																	
A	25,00,000	8,00,000	10																	
B	20,00,000	6,00,000	10																	
C	30,00,000	10,00,000	10																	

5	Classify cost dominated cash flow diagram to derive the Annual Equivalent Method.	BTL 4	Analyzing	PO11																		
6	<p>i) Discuss about the rate of return method. ii) Consider the following two mutually exclusive alternatives</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th></th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>Cost</td> <td>4000</td> <td>6000</td> </tr> <tr> <td>Uniform annual benefit</td> <td>640</td> <td>960</td> </tr> <tr> <td>Useful life(in years)</td> <td>20</td> <td>20</td> </tr> </tbody> </table> <p>Using interest rate determine which alternative should be selected based on the future worth method of comparison.</p>		A	B	Cost	4000	6000	Uniform annual benefit	640	960	Useful life(in years)	20	20	BTL 5	Evaluating	PO11						
	A	B																				
Cost	4000	6000																				
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7	<p>A company must decide whether to buy machine A or machine B.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th></th> <th>Machine A</th> <th>Machine B</th> </tr> </thead> <tbody> <tr> <td>Initial cost(Rs)</td> <td>3,00,000</td> <td>6,00,000</td> </tr> <tr> <td>Useful life(years)</td> <td>4</td> <td>4</td> </tr> <tr> <td>Salvage value at the end of machine life(Rs)</td> <td>2,00,000</td> <td>3,00,000</td> </tr> <tr> <td>Annual maintenance</td> <td>30000</td> <td>0</td> </tr> </tbody> </table>		Machine A	Machine B	Initial cost(Rs)	3,00,000	6,00,000	Useful life(years)	4	4	Salvage value at the end of machine life(Rs)	2,00,000	3,00,000	Annual maintenance	30000	0	BTL 6	Creating	PO11			
	Machine A	Machine B																				
Initial cost(Rs)	3,00,000	6,00,000																				
Useful life(years)	4	4																				
Salvage value at the end of machine life(Rs)	2,00,000	3,00,000																				
Annual maintenance	30000	0																				
8	Classify cost dominated cash flow diagram to derive the Annual Equivalent Method.	BTL 4	Analyzing	PO11																		
9	<p>A man owns a corner plot. He must decide which of the several alternatives to select in trying to obtain a desirable return on his investment. After much study and calculation, he decides that the two best alternatives are given as in the following table:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th></th> <th>Build soft Gas station stand</th> <th>ice-cream</th> </tr> </thead> <tbody> <tr> <td>First cost</td> <td>20,00,000</td> <td>36,00,000</td> </tr> <tr> <td>Annual Property taxes</td> <td>80,000</td> <td>1,50,000</td> </tr> <tr> <td>Annual income</td> <td>8,00,000</td> <td>9,80,000</td> </tr> <tr> <td>Life of building (in years)</td> <td>20</td> <td>20</td> </tr> <tr> <td>Salvage value</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>i) What is the best alternative based on the future worth method at $i=12\%$. ii) How will you represent the cost-dominated cash flow diagram?</p>		Build soft Gas station stand	ice-cream	First cost	20,00,000	36,00,000	Annual Property taxes	80,000	1,50,000	Annual income	8,00,000	9,80,000	Life of building (in years)	20	20	Salvage value	0	0	BTL 4	Analyzing	PO11
	Build soft Gas station stand	ice-cream																				
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Annual income	8,00,000	9,80,000																				
Life of building (in years)	20	20																				
Salvage value	0	0																				
10	<p>Discuss in detail about the different cash flow methods and also give their formulas. ii) A firm is diversifying into a new business. The life of the business is 10 years without any salvage value at the end of life. The initial outlay required is Rs.20,00,000/- and the annual net profit estimated is Rs.3,50,000/-. Find the rate of return for the new business. Check whether the business is worth for a cost of capital of 12%</p>	BTL 1	Remembering	PO11																		

UNIT IV REPLACEMENT AND MAINTENANCE ANALYSIS				
Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely				
PART – A				
CO Mapping : C214.4				
Q.No	Questions	BT Level	Competence	PO
1	What is future worth analysis?	BTL 1	Remembering	PO7, PO11

2	What is annual equivalent method?	BTL 1	Remembering	PO7
3	What is Replacement analysis?	BTL 1	Remembering	PO7, PO11
4	What is mean by gradual failure?	BTL 1	Remembering	PO7
5	Define economic service life of an asset?	BTL 1	Remembering	PO7, PO11
6	What are the types of replacement problem?	BTL 1	Remembering	PO7
7	What are the types of replacement problem?	BTL 1	Remembering	PO7
8	Explain annual equivalent total cost.	BTL 5	Evaluating	PO7, PO11
9	Name the types of maintenance.	BTL 1	Remembering	PO7
10	State the main causes of breakdown.	BTL 1	Remembering	PO7, PO11
11	State any two disadvantages of break down maintenance.	BTL 1	Remembering	PO7, PO11
12	Explain Predictive maintenance	BTL 5	Evaluating	PO7, PO11
13	What is predictive maintenance?	BTL 1	Remembering	PO7, PO11
14	What are all the types of Replacement problem?	BTL 1	Remembering	PO7
15	What are the reasons for replacement?	BTL 1	Remembering	PO7
16	What are the needs for maintenance?	BTL 1	Remembering	PO7
17	What are the various types of maintenance cost?	BTL 1	Remembering	PO7, PO11
18	what are the disadvantages in scheduled maintenance?	BTL 1	Remembering	PO7, PO11
19	What are the advantages in preventive maintenance?	BTL 1	Remembering	PO7
20	write a short notes on the concept of challenger and defender.	BTL 1	Remembering	PO7
21	What are the objectives of plant maintenance?	BTL 1	Remembering	PO7, PO11
22	What is the importance of plant maintenance?	BTL 1	Remembering	PO7, PO11
23	What are the elements of preventive maintenance?	BTL 1	Remembering	PO7, PO11
24	What are the elements get impact of poor maintenance?	BTL 1	Remembering	PO7, PO11
25	What are the factors to be considered for replacing equipments?	BTL 1	Remembering	PO7, PO11

PART – B

1	(i) List the features of Maintenance. How would you manage maintenance in any sector? (8 marks) (ii) List the causes for replacement of assets in detail. (8 marks)	BT 1	Remembering Remembering	PO7, PO11
2	(a) Find the comparative use value of the old machine. (b)Is it advisable to replace the old machine? (b)A machine was purchased two years ago for Rs. 10,000. Its annual maintenance cost is Rs.750. Its life is six years and its salvage value at the end of its life is Rs.1, 000. Now, a company is offering a new machine at a cost of Rs. 10,000.	BT 2	Understanding	PO7, PO11

	<p>Its life is four years and its salvage value at the end of its life is Rs.4, 000. The annual maintenance cost of the new machine is Rs. 500. The company which is supplying the new machine is willing to take the old machine for Rs. 8,000 if it is replaced by the new machine. Assume an interest rate of 12%, compounded annually.</p>			
3	<p>i) How would you show your understanding in finding the economic life of an asset? (8 marks) (ii) How would you use the concept of challenger and Defender in replacement?(8 marks)</p>	BT 3	Applying	PO7, PO11
4	<p>i) Discuss about Simple probabilistic model for items which fail completely. (8 marks) (ii) Two years ago, a machine was purchased at a cost of Rs.2, 00,000 to be useful for eight years. Its salvage at the end of its life is Rs.25, 000. The annual maintenance cost is Rs. 1, 20,000. Now, a new machine to cater to the need of the present machine is available at Rs. 1, 50,000 to be useful for six years. Its annual maintenance cost is RS. 14,000. The salvage value of the new machine is RS. 20,000. Using an interest rate of 12%, find whether it is worth replacing the present machine with the new machine. (8 marks)</p>	BT 5	Evaluating	PO7, PO11
5	<p>i) Explain the types of Replacement. (8 marks) (ii) Compare replacement and maintenance analysis.</p>	BT 2	Understanding	PO7, PO11
6	<p>Challenger and Defender: Two years ago, a machine was purchased at a cost of Rs.2, 00,000 to be useful for eight years. Its salvage value at the end of its life is Rs. 25,000. The annual maintenance cost is Rs.25, 000. The market value of the present machine is Rs. 1, 20,000. Now, a machine to cater to the need of the present machine is available at Rs. 1, 50,000 to be useful for six years. Its annual maintenance cost is Rs. 14,000. The salvage value of the new machine is Rs. 20,000. Using an interest rate of 12%, how would you find whether it is worth replacing the present machine with the new machine?</p>	BT 6	Creating	PO7, PO11
7	<p>(i) Examine the concept of Capital recovery with return. (ii) A firm is considering replacement of equipment, whose first cost is Rs. 1,750 and the scrap value is negligible at any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs. 100 every year thereafter. (a) When should the equipment be replaced if $i = 0\%$? (b) When should the equipment be replaced if $i = 12\%$?</p>	BT 4	Analyzing	PO7, PO11
8	<p>Compare the two alternatives and make an annual equivalent cost analysis to determine whether to keep or replace the old engine. A diesel engine was installed 10 years ago at a cost of Rs. 50,000. It has a present realizable market value of Rs. 15,000. If kept, it can be expected to last five years more, with operating and maintenance cost of Rs.14, 000 per year and to have a salvage value of Rs. 8,000 at the end of the fifth year. This engine can be replaced with an improved version costing Rs. 65,000 which has an expected life of 20 years. This improved version will have an estimated annual operating and maintenance cost of Rs. 9,000 and ultimate salvage value of Rs. 13,000. Using an interest rate of 15%, make an annual equivalent</p>	BT 2	Understanding	PO7, PO11
9	<p>A firm is considering replacement of equipment, whose first cost is Rs. 4,000 and the scrap value is negligible at the end of any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs.200 every year thereafter.</p>	BT 1	Remembering	PO7, PO11

	(i) When should the equipment be replaced if $i = 0\%$? (ii) When should the equipment be replaced if $i = 12\%$?			
10.	Can you identify the replacement problem and suggest your idea to eradicate it.	BT 4	Analyzing	PO7, PO11

UNIT V DEPRECIATION				
Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the years digits method of depreciation, sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions – procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.				
PART – A				
CO Mapping : C214.5				
Q.No	Questions	BT Level	Competence	PO
1	Define the term “Depreciation”.	BTL 1	Remembering	PO2, PO6, PO12
2	Mention the various method used in depreciation calculation.	BTL 1	Remembering	PO6, PO12
3	What is service output method of depreciation?	BTL 1	Remembering	PO6, PO12
4	What are the causes of depreciation?	BTL 1	Remembering	PO6, PO12
5	Write five reasons for providing depreciation.	BTL 2	Understanding	PO6, PO12
6	What is evaluation of public alternatives?	BTL 1	Remembering	PO6, PO12
7	Define the term inflation?	BTL 1	Remembering	PO2, PO6, PO12
8	What is sinking fund?	BTL 1	Remembering	PO2, PO6, PO12
9	What is amortization?	BTL 1	Remembering	PO6, PO12
10	What are the causes of inflation?	BTL 1	Remembering	PO6, PO12
11	What is sinking fund method of depreciation?	BTL 1	Remembering	PO6, PO12
12	What is consumer price index?	BTL 1	Remembering	PO7, PO12
13	What are the three level of inflation?	BTL 1	Remembering	PO6, PO7
14	what is meant by galloping inflation?	BTL 1	Remembering	PO6, PO7
15	How inflation is controlled?	BTL 1	Remembering	PO6, PO7
16	What are the control devices used by RBI to control and regulate the bank credit? Bank rate policy.	BTL 1	Remembering	PO6, PO7, PO12

17	What is meant by demonetization?	BTL 1	Remembering	PO6, PO7,PO12
18	What are the types of inflation?	BTL 1	Remembering	PO6,PO12
19	What is meant by deflation?	BTL 1	Remembering	PO6, PO7,PO12
20	What is benefit-cost (BC) ratio?	BTL 1	Remembering	PO2, PO7,PO12
21	Mention the procedure to adjust inflation.	BTL 1	Remembering	PO6, PO12
22	What are the factor affecting the periodic allocation of depreciation?	BTL 1	Remembering	PO2, PO7,PO12
23	write the classification of depreciation.	BTL 2	Understanding	PO6, PO7
24	What are all the effects of inflation?	BTL 1	Remembering	PO6, PO12
25	Define Net National Product (NNP).	BTL 1	Remembering	PO6, PO7

PART – B

1	(i) How would you explain the various methods of depreciation? (ii) Two equipments are purchased each for Rs.12,000/-. The estimated useful life is 5 years for both the estimated scrap value for each equipment is RS.2,000/-. For one equipment the straight line method is used to calculate annual depreciation and for the other equipment, the reducing balance method is adopted. Compare the depreciation charges for both for all the 5years.	BT L 1 BT L 5	Remembering	PO2, PO7,PO6
2	(i) Explain inflation adjusted decision. (ii) A machine costs Rs.5,00,000/-. Its annual operation cost during the first year is Rs.40,000/- and it increases by Rs.5000/- every year thereafter. The maintenance cost during the first year is Rs.60,000/- and it increases by Rs.6000/- every year thereafter. The resale value of the machine is Rs.4,00,000/- at the end of the first year and it decreases by Rs.50,000/- every year thereafter. Take an interest rate of 20%. Find the economic life of the asset.	BTL 5 BTL 5	Understanding	PO2, PO7,PO6
3	Himalaya Drug Company has just purchased a capsulating machine for Rs. 10, 00,000. The plant engineer estimates that the machine has a useful life of 5 years and a salvage value of Rs. 10,000 at the end of its useful life. Compute the depreciation schedule for the machine by each of the following depreciation methods : (i) Straight line method of depreciation. (ii) Sum –of-the-year’s digits method of depreciation.	BTL 3	Applying	PO2, PO7,PO6
4	Analyze if a 40 year old man is planning for his retirement. He plans to retire at the age of 60 and estimates that he can live comfortably on Rs. 24,000 per year in terms of today’s rupee value. He can invest his savings at 15% compounded annually. Assume an average inflation rate of 9% for the next 30 years. What equal amount should he save each year until he retires so that he can make withdrawals at the end of each year commencing from the end of the 21st year from now that will allow him to live as comfortably as he desires for 10 years beyond his retirement?	BT 4	Analyzing	PO2, PO7
5	(i) Explain the procedure to adjust inflation. (ii) Find the depreciation annuity by annuity method after three years, the initial cost of the machine is Rs.8, 00,000 a salvage value at the end of three years is Rs. 4, 00,000. Rate of interest 10%.	BT 5	Evaluating	PO2, PO7

6	<p>How would you evaluate that in a particular locality of a state, the vehicle users take a roundabout route to reach certain places because of the presence of a river? This results in excessive travel time and increased fuel cost. So, the state governments planning to construct a bridge across the river. The estimated initial investment for constructing the bridge is Rs. 40, 00,000. The estimated life of the bridge is 15 years. The annual operation and maintenance cost is Rs. 1, 50,000. The value of fuel savings due to the construction of the bridge is Rs. 6, 00,000 in the first year and it increases by Rs. 50,000 every year thereafter till the end of the life of the bridge. Check whether the project is justified based on BC ratio by assuming an interest rate of 12%, compounded annually.</p>	BT 1	Remembering	PO2, PO6, PO12
7	<p>(i) Define the difference in evaluating alternatives of private and public organizations. (ii) A company has purchased an equipment whose first cost is Rs. 1, 00,000 with an estimated life of eight years. The estimated salvage value of the equipment at the end of its lifetime is Rs. 20,000. Determine the depreciation charge and book value at the end of the 5th year using the sum-of-the-years-digits method of depreciation.</p>	BT 1	Remembering	PO2, PO7
8	<p>(i) Explain the consideration of the evaluation of the alternative of constructing a bridge across a river. List the different benefits and costs related to this alternative. (ii) How would you compare declining balance method of depreciation and double declining balance method of depreciation?</p>	BT 2	Understanding	PO2, PO7, PO12
9	<p>Robert & Co. Purchased Machinery on 1st April 2002 for Rs. 75,000. After having used it for three years it was sold for Rs. 35,000. Depreciation is to be provided every year at the rate of 10% per annum on declining balance method. Accounts are closed on 31st March every year. Find out the profit or loss on sale of machinery.</p>	BT 3	Applying	PO2, PO6
10	<p>(i) The cost of a machine is Rs.1, 60,000 and its scrap value is Rs. 40,000. Estimated life 5 years. Using sum of year's digits method, determine depreciation charges for each year. Demonstrate the calculations of the sum-of-the-years-digits method of depreciation. (8 marks) (ii) Two mutually exclusive projects are being considered for investment. Project A1 requires an initial outlay of Rs. 30, 00,000 with net receipts estimated as Rs. 9, 00,000 per year for the next 5 years. The initial outlay for the project A2 is Rs. 60, 00,000, and net receipts have been estimated at Rs. 15, 00,000 per year for the next seven years. There is no salvage value associated with either of the projects. Using the benefit cost ratio, which project would you select? Assume an interest rate of 10%.</p>	BT 4	Analyzing	PO2, PO7

UNIT I		INTRODUCTION TO ECONOMICS	
Introduction to Economics- Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio, Elementary economic Analysis – Material selection for product Design selection for a product, Process planning			
PART – A			
1.What is elasticity of Demand? . (April/May2008) Elasticity of demand may be defined as the degree of responsiveness of quantity demanded to a Change in price			
2.Define the term `cost'? (April/May 2017) (April/May2015) (May /June 2016) Cost may be defined as a total of all expenses incurred, whether paid of outstanding in the manufacture and sale of a product.			
3. What is opportunity cost? (April/May2008) (Nov/Dec 2008) (May /June 2013) Opportunity cost may be defined as the potential benefit that is given up as you seek an alternative course of action. In other words, the expected return or benefit for gone in rejecting one course of action for another.			
4.What do you mean by marginal cost? (Nov/Dec 2016) The institute of cost & works Accountants of India defined marginal cost as, “the amount at any given volume of output by which aggregate cost are changed, if the volume of output is increased or decreased by one unit.			
5. Explain marginal costing? (Nov/Dec 2016) Marginal costing is defined by the ICWA as, “the ascertainment by differentiating between fixed costs, of marginal costs and of the effect on profit of changes in volume or type of output”.			
6. What is meant by marginal revenue? (Nov/Dec 2015) The revenue that can be obtained from selling one more unit of product is called marginal revenue.			
7. Give a short note on sunk cost? (May /June 2012) A cost which was incurred or sunk in the past and is not relevant to the particular decision making is a sunk cost or sunk loss. It may be variable or fixed or both.			
8. List out the elements of cost? (Nov/Dec 2015) The elements of cost are: ✓ V Materials ✓ Labor cost ✓ Expenses			
9. Define the term costing? Institute of costs and Management Accountants, (I.C.M.A) London has defines costing as the ascertainment of costs. “it refers to the techniques and process of ascertaining costs and studies the principles and rules concerning the determination of costs of products and services” .			
10. What is Break-even point? (Nov/Dec 2013) The Break-even point is, therefore, the volume of output at which neither a profit is made nor a loss is incurred. It is a point where the total sales are equal to total cost.			
11. Define P/V ratio. (May/June 2013) Profit-Volume ratio expressed as a percentage indicates the relative profitability of different products			
12.Differentiate “technical efficiency and economic efficiency” (Nov/Dec 2013)			
s.no	Technical efficiency	Economic efficiency	
1	Efficiency =(output /input) X 100	Worth / cost	
2.	Technical efficiency happens when there is no possibility to increase the output without increasing the input	Economic efficiency happen when production cost of an output is as low as possible	
13.write down the disadvantages large scales production (Nov/Dec 2012) It may ultimately lead to monopolistic combination firms			

It depends on exports. if for any reasons exports the firms will suffers
Artistic goods cannot be produces in large scales production

14.list out the scope of economics (Nov/Dec 2012)

Subject matter of economics

Whether economics is a science or an art

Is it a positive or a normative science

15.what are the types of consumption(April/May2010)

Direct consumption, indirect consumption and waste full consumption

16.State the Law of Demand. (Nov/Dec 2009)

It states that demand will be more at lower price this is due to diminishing utilities

17.what is diversification of marketing(Nov/Dec 2009)

A firm not only sales , commodities in the internal market but also in the foreign markets so that if demand in foreign market falls , it si sustains by the sales in the internal markets

18.What are the main areas of application of managerial economics

It is application of economic theory and methodology to managerial decision. The emphasis in this course will on demand analysis and estimation, production and cost analysis and different market condition. Forecasting and decision making under uncertainty.

19.State the sources of wants

The human motives that induces the business and economics activities which produce the desire goods and services.

20.Differrentiate wealth and money

s.no	Wealth	money
1	Having a large amount money or possessions	A medium of exchange
2.	The ability to survive a certain no of days forward	Money is and idea, backed by confidence

21.what is the form of utility

The process of increasing the attractiveness of a product to a group consumers by altering its physical appearances.

22.give examples for wealth and wants

Wealth : a great quantity or store money, property or other riches

Wants: clothing shelters and nutrients

23.Difine law of diminishing marginal utility

The additional benefits which person derives from a given increase of his stock of a thing diminishing with every increases in the stock that he already has.

24. list out the advantages of small scale production

More employment . small capitals, close supervisions freedom of work easy management

25. what are kinds of external economics

Economy of concentrating economy information economy disintegrating

26. what are factors determined internal economics

Labor economics, technical economics, marketing, managerial economics financial economics

27.describe price theory

The price of commodity falls when its apply increases because its marginal utility diminishes

28. what is the basis of taxations

Taxations its based on principle of progression the rate of taxations increase as the income increases

29.what is consumption

The uses of goods and services for which we pay a price only come under consumption

30. write down the types of capitals

Fixture capital working capital circulating capital floating capital and sunk capital

PART – B

1. Bring out the scope of Engineering economics with appropriate example. (Nov/Dec 2016) (April/May2017)

2. Explain in detail about flow in an economy. (Nov/Dec 2016)

3. Briefly explain about element of cost and its classification (Nov/Dec 2016)

4. Discuss opportunity and describe process planning. (April/May2017)

5. Discuss the nature and scope of managerial economics (May/ June 2013)

6. Explain how managerial economics helps in solving managerial problems (May/ June 2013)

7. Explain the following a) Micro economics b) Macro economics c) Normative economics d) Positive economics (May/ June 2013)
8. Discuss the scope of Engineering economics with NANO technology as a new science introduced in the industry (Nov/Dec 2008)
9. Enumerate the concept of extension and contraction in demand (April / May 2011)
10. Differentiate monopoly from monopolistic competition. (April / May 2011)
11. What is demand forecasting? Explain any four method of forecasting. (April / May 2011)
12. Explain the factors influencing demand and supply. (Nov/Dec 2013)

UNIT II VALUE ENGINEERING

Make or buy decision, Value engineering – Function, aims, Value engineering procedure. Interest formulae and their applications –Time value of money, Single payment compound amount factor, Single payment present worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factor-equal payment series capital recovery factor-Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.

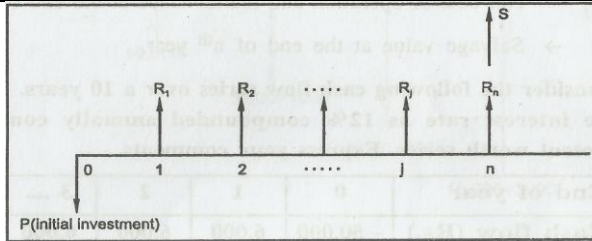
PART – A

1. What do you mean by `Make or Buy Decisions'? (Nov/Dec 2017) (May/June 2016)(Nov/Dec 2015)	<p>✓ Make or buy decision is a determination whether to produce a component part internally or to buy it from an outside supplier.</p> <p>✓ The Organization should evaluate the costs and benefits of manufacturing a product or product component against purchasing it and then select the alternative which results in the lower cost.</p>
2. What are the different approaches followed in make or buy decision? (Nov/Dec 2017)	<p>The following are the approaches followed in make or buy decision.</p> <p>✓ Simple cost analysis</p> <p>✓ Economic analysis</p> <p>✓ Break-even analysis</p>
3 What is mean by value analysis/value engineering?. (Nov/Dec 2016)(April/May 2017)(Nov/Dec 2015)	<p>The steady state error is defined as the value of error as time tends to infinity. The steady state error is a measure of system accuracy. These error arise from the nature of inputs, type of system and from non linearity of system component.</p>
4. What do you mean by value of a product? (April/May 2017)	<p>Value differs from both price and cost in the sense that it is the cost proportionate to the function. We can express value mathematically as Value =function or utility/ cost</p>
5. Explain `function'. (Nov/Dec 2016)	<p>Function specifies the purpose of the product or what the product does, what is its utility etc.</p>
6. What are the different types of values? (May/June 2016)	<p>✓ Cost value</p> <p>✓ Exchange value</p> <p>✓ Use value</p> <p>✓ Esteem value</p>
7.What are the various functions of a product? (April/May 2015)	<p>Functions can be classified into the following three categories:</p> <p>✓ Primary functions</p> <p>✓ Secondary functions</p> <p>✓ Tertiary functions</p>
8. Write any four objectives of value analysis.	<p>✓ Reduce the cost of the product</p> <p>✓ Simplify the product</p> <p>✓ Use (new) cheaper and better materials</p> <p>✓ Modify and improve product design so as to make it acceptable to consumer</p>
9. List any four advantage of value engineering. (Nov/Dec 2006)(April/May 2008)	

<ul style="list-style-type: none"> ✓ Value engineering/analysis identifies and reduces the product cost. ✓ It modifies and improve the product design ✓ It increases the performance/utility of the product by economical means. ✓ It helps to generate new ideas.
<p>10. Explain concept of discounting (Nov/Dec 2009) Discounting is a financial mechanism in which a debtor obtains the right to delay payments to a creditor, for a define period of time, in exchange for a charge or fee.</p>
<p>11. What is value engineering ? It is an intensive, interdisciplinary, problem solving activity that focus on improving the value of the functions that are required to accomplish the goal or objective of any product, process, service, project or organization.</p>
<p>12. Write any four aims of value engineering To minimize total cost of the project and processes. To eliminate unnecessary cost. To make the project easier and successful by improving quality and to ensure safe operation and environmental and ecological goals.</p>
<p>13.what is meant by cash flow diagram The sum money recorded as receipts or disbursements in project financial records or calls cash flow The graphical representation of a cash flow i.e., both cash outflows and cash inflows with respect to a times scales is called cash flow diagram</p>
<p>14.write down the general principal of economics equivalent calculations equivalent calculations made to compare alternatives requires a common time basics equivalents depends on interests rate equivalent calculations may need the conversion of multiple payment cash flows to single cash flow</p>
<p>15. List out the method for calculating interest payment Single payment compound amount Single payment present worth method Equal payment series amount Equal payment series sinking fund Equal payment series present worth amount Equal payment series capital recovery amount Uniform gradient series annual equivalent amount</p>
<p>16. Mention any two criteria for buy decision. Non availability of the facilities that are required to make the product item Non availability of sufficient amount to buy machines, equivalent and other resources to be used in the manufacturing of product item. Non availability of the skilled worker who can make the product</p>
<p>17. What is simple interest? Simple interest is calculated on the original principal only. Accumulated interested from prior is not used in calculation for the following period i.e., simple interest means that interest is not given on interest</p>
<p>18. List out the benefits of value engineering. It reduces the operation cost by simplifying the procedures and increasing procedural efficiency. Improves quality management and resources efficiency. Prevents over design of components. Balances cost and performance. Orients employees towards creative thinking</p>
<p>19. Write note on equal payment series sinking fund. In this mode of investment the main objective is to find the equivalent amount that should be invested at the end of each interest period to realize the future sum.</p>
<p>20. Write a note single payment present worth amount. Finding the present worth of a future sum is simply the reverse of compounding and is known as discounting processes.</p>
<p>21. How effective interest rate is calculated? The effective interest rate is the amount the borrower pays in interest fees and commissions divided by the borrower receives.</p>
<p>22. what is time value of money? This is an important concept that differentiates the discounted cash flow with the traditional method. The essence of this concept is that money received earlier is more valuable than that received later.</p>
<p>23. Techniques / approaches of make or buy decision. Simple cost analysis. Economic analysis. Break-even analysis.</p>
<p>24. What is economic analysis? Economic analysis involves in evaluation of the economic order quantity and total cost for make and buy alternatives based on the inventory control concepts</p>

Purchase model Manufacturing model.
PART – B
1. What are all the function aims of value engineering discuss the value engineering procedure. (Nov/Dec 2009)
2. What is time value of money? How is it useful in taking investment related decision? (Nov/Dec 2009)
3. Compute the present value of Rs. 1000 receivable 6 years hence if the rate of discount is 10 percent? (Nov/Dec 2009)
4. Explain in detail about criteria for make or buy decision and its approaches (Nov/Dec 2016)
5. Explain problems in single payment present worth factor (Nov/Dec 2016)
6. Discuss make or buy decision and explain value engineering procedure (April/May 2017)
7. Describe the function and aims of value engineering (April/May 2017)
8. A company has to replace an asset after 10 years at an outlay of Rs. 5 lakhs it plans to deposit an equal amount at the end of every year for next year at an annually compounded interest of 20% Find the equivalent amount to be deposited at the end of every year for the next 10 year. (April/May 2017)
9. Explain the factor governing elasticity of demand.
10. How will you measure elasticity of demand. Illustrate how do you interpret the different types of elasticity.
11. Explain how supply and demand determine the equilibrium price. What happens if the supply curve shift to the left?

UNIT III CASH FLOW
Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), Annual equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.
PART – A
1. What is revenue dominated cash flow? (Nov/Dec 2017)(Nov/Dec 2015)(May/June 2016) The profit/revenue, salvage value of all inflows to an organization will be assigned with positive sign and the cost outflows will be assigned with negative sign is called revenue dominated cash flow.
2. What is cost of dominated cash flow? (Nov/Dec 2017) (April/May 2017) <ul style="list-style-type: none"> ✓ The cost outflow will be assigned with positive sign and profit, revenue salvage value all inflows etc., ✓ Will be assigned with negative sign is called cost dominated cash flow.
3. Mention the various rate of return method. (April/May 2017)(Nov/Dec 2014) <ul style="list-style-type: none"> ✓ Internal rate of return (IRR) ✓ Average rate of return (ARR) ✓ Net present value method (NPV) ✓ Pay-back period (PBP)
4. What is rate of return? (Nov/Dec 2016) Rate of return is the break-even interest rate, i , which equates the present worth of a project's cash outflows to the present worth its cash inflow
5. What is present worth method? (Nov/Dec 2013)(Nov/Dec 2014) <ul style="list-style-type: none"> ✓ The present worth measures the surplus in an investments project at time zero (0). ✓ The present worth of all cash inflows is computed the present worth of all cash outflows associated with an investment of project is called present worth method.
6. Limitations of cash flow analysis? <ul style="list-style-type: none"> ✓ Cash flow statement cannot be equated with the income statement. ✓ The cash balance may not represent the real liquid position of the business. ✓ Cash flow statement cannot replace the funds flow statement.
7. Draw revenue – dominated cash flow diagram for present worth method.



Where,

P = initial investment

i = interest rate

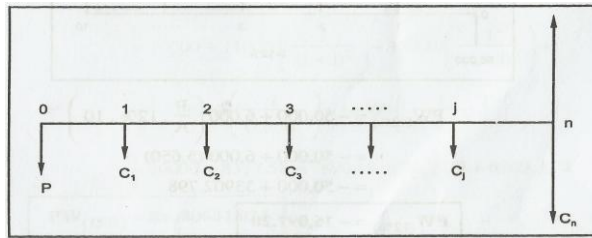
PW = present worth interest rate

R = Revenue

R_j = Revenue at the end of **jth** year

S = salvage value at the end of **nth** year.

8. Draw cost – dominated cash flow diagram for present worth method.



Where,

P = initial investment

i = interest rate

S = salvage value at the end of **nth** year.

C = Cost of operation

C_j = Net Cost of operation and maintenance at the end of **jth** year

9. Consider the following cash flow series over a 10 years. Assuming the interest rate as 12% compounded annually. Compute the present worth series. Express your comments.

End of the year	0	1	2	3...	10
Cash flow (Rs)	-50,000	6,000	6,000	6,000	6,000

Solution :

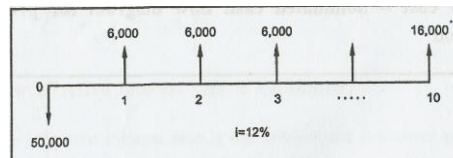
$$P = -50,000$$

$$A \text{ (or) } R = 6,000$$

$$i = 12\%$$

$$n = 10 \text{ years}$$

Flow diagram

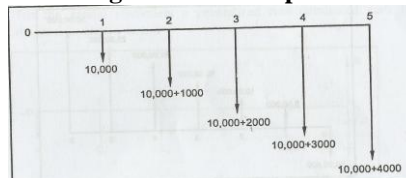


$$PW_{(12\%)} = -50,000 + 6,000 (P/A, 12\%, 10)$$

$$= -50,000 + 6,000 (5.650)$$

$$= -16,097.20$$

10. Take the following cash flow diagram. Find the present worth, take **i = 15%** annually.



Solution :

$$P = -50,000$$

Annual increase in income = 1,000

$$n = 5 \text{ years}$$

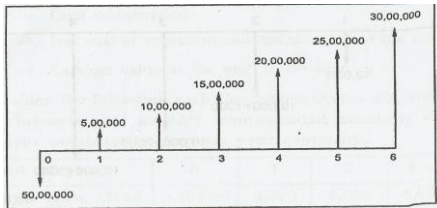
$$i = 15\%$$

$$PW_{(15\%)} = -10,000 + 1,000 (A/G, 15\%, 5) X (P/A, 15\%, 5)$$

$$= 10000 + 8317.58 + 7890.19 + 7432.79 + 6960.474$$

$$= \text{Rs } 40601.034$$

11. Determine the future worth method by assuming interest rate of 10%, for the given diagram. Add your comment.



Solution:

$$P = 50,00,000$$

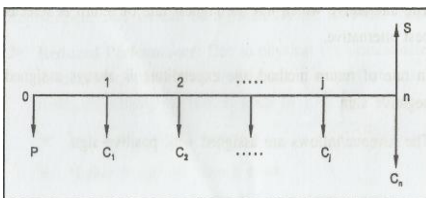
$$R_1 = 5,00,000$$

$$n = 6$$

$$i = 10\%$$

$$\begin{aligned} FW_{(10\%)} &= -50,00,000(1+0.1)^6 + 5,00,000(1+0.1)^{6-1} + 10,00,000(1+0.1)^{6-2} + 15,00,000(1+0.1)^{6-3} \\ &\quad + 20,00,000(1+0.1)^{6-4} + 25,00,000(1+0.1)^{6-5} + 30,00,000(1+0.1)^{6-6} \\ &= 2,12,93,660 \end{aligned}$$

12. Determine the future worth method by assuming interest rate of 10% for the given diagram. Add your comment



Where,

P = initial investment

C = Cost of operation

i = interest rate

C_j = Net Cost of operation and maintenance at the end of j^{th} year

S = salvage value at the end of n^{th} year.

13. A person deposits a sum of Rs 20,000 at the interest rate of 18% compounded annually for 10 years. Find the maturity value after 10 years.

Solution:

$$P = 20,000$$

$$i = 18\%$$

$$n = 10 \text{ years}$$

$$F = P(1+i)^n$$

$$= 20,000(F/P, 18\%, 10)$$

$$= 20,000(5.234)$$

$$= \text{Rs } 1,04,680 \quad \text{The maturity value for given investment at 18\% compounded annually is 1,04,680 after 10 Yr.}$$

PART – B

1. Explain in detail about future worth method (Revenue dominated cash flow diagram)

2. (i) How would you describe the revenue dominated cash flow diagram?

(ii) Explain present worth method.

3. A company invests in one of the two mutually exclusive alternatives. The life of both alternatives is estimated to be 5 years returns & with the following investment, annual salvage values.

	Alternative	
	A	B
Investment(Rs)	-1,50,000	-1,75,000
Annual equal return (Rs)	60,000	70,000
Salvage value (Rs)	15,000	35,000

Determine the best alternative based on the annual equivalent method by assuming $i=25\%$.

4. i) A company has three proposals for expanding its business operations.

The details are as follows:

Alternative	Initial cost	Annual revenue	Life(years)
A	25,00,000	8,00,000	10
B	20,00,000	6,00,000	10
C	30,00,000	10,00,000	10

Each alternative has insignificant salvage value at the end of its life.

Assuming an interest rate of 15% compounded annually, find the best alternative for expanding the business operations of the company using the annual equivalent method.

ii) How would you understand the concept of Annual Equivalent Method? (Revenue Dominated Cash Flow Diagram)

5. Classify cost dominated cash flow diagram to derive the Annual Equivalent Method.

6. i) Discuss about the rate of return method.

ii) Consider the following two mutually exclusive alternatives

	A	B
Cost	4000	6000
Uniform annual benefit	640	960
Useful life(in years)	20	20

Using interest rate determine which alternative should be selected based on the future worth method of comparison.

7. A company must decide whether to buy machine A or machine B.

	Machine A	Machine B
Initial cost(Rs)	3,00,000	6,00,000
Useful life(years)	4	4
Salvage value at the end of machine life(Rs)	2,00,000	3,00,000
Annual maintenance	30000	0

8. Classify cost dominated cash flow diagram to derive the Annual Equivalent Method.

9. A man owns a corner plot. He must decide which of the several alternatives to select in trying to obtain a desirable return on his investment. After much study and calculation, he decides that the two best alternatives are given as in the following table:

	Build soft Gas station	ice-cream stand
First cost	20,00,000	36,00,000
Annual		
Property taxes	80,000	1,50,000
Annual income	8,00,000	9,80,000
Life of building (in years)	20	20
Salvage value	0	0

i) What is the best alternative based on the future worth method at $i=12\%$.

ii) How will you represent the cost-dominated cash flow diagram?

10. Discuss in detail about the different cash flow methods and also give their formulas.

ii) A firm is diversifying into a new business. The life of the business is 10 years without any salvage value at the end of life. The initial outlay required is Rs.20,00,000/- and the annual net profit estimated is Rs.3,50,000/-. Find the rate of return for the new business. Check whether the business is worth for a cost of capital of 12%

UNIT IV REPLACEMENT AND MAINTENANCE ANALYSIS

Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely

PART – A

1. What is future worth analysis? (Nov/Dec 2017)

- ✓ Net future worth measures the surplus at time period other than 0.
- ✓ Future worth analysis is particularly useful in an investment situation where we need to compute the equivalent worth of a project at the end of its investment period.

2. What is annual equivalent method? (Nov/Dec 2017) (Nov/Dec 2015) (April/May 2017)

The criterion provide a basis for measuring investment worth by determining equal payments on an annual basis is called annual equivalent method.

3. What is Replacement analysis? (April/May 2017)

- ✓ Replacement analysis involves the Replacement of existing obsolete or worn-out assets in order to avoid failure in operations.
- ✓ The problems often faced by management of various industries are whether to replace equipment or to continue to use existing equipment, and when existing equipment should be replaced with efficient equipment.
- ✓ This class of decision analysis is known as replacement analysis.

<p>4. What is mean by gradual failure? (Nov/Dec 2016)</p> <ul style="list-style-type: none"> ✓ . Gradual failure is progressive in nature. ✓ It can be depicted in machine equipment, which is gradually depreciating or deteriorating with the time resulting in very high operating and maintenance cost and/or decreased residual value. ✓ It is easier to predict such type of failure and taking the corrective measures by providing a replacement policy for such machine equipment.
<p>5. Define economic service life of an asset? (Nov/Dec 2016)(Nov/Dec 2015) The economic service life of an asset is defined to be the period of useful life that minimizes the annual equivalent cost of owning and operating the asset</p>
<p>6. What are the types of replacement problem? (May/June 2016) (a) Replacement of assets that deteriorate with time (replacement due to gradual failure, or wear and tear of the components of the machine).</p> <p>This can be further classified in to the following types:</p> <ol style="list-style-type: none"> 1. Determination of economic life an asset 2. Replacement of an asset with a new asset. <p>(b) Simple probabilistic model for assets which fails completely. (Replacement due to sudden failure).</p>
<p>7. Explain annual equivalent total cost. (May/June 2016) Annual equivalent total cost of owning and operating an asset is a summation of the capital recovery cost (average first cost) and the annual equivalent operating cost of the asset.</p>
<p>8. Name the types of maintenance.</p> <ul style="list-style-type: none"> ✓ Corrective or Breakdown maintenance. ✓ Scheduled maintenance ✓ Preventive maintenance and ✓ Predictive maintenance
<p>9 . State the main causes of breakdown. (May/June 2011)</p> <ul style="list-style-type: none"> ✓ Failure to replace worn out parts ✓ Lack of lubrication ✓ Indifference towards minor faults
<p>10. State any two disadvantages of break down maintenance.</p> <ol style="list-style-type: none"> 1. Delays in production 2. Faster plant deterioration
<p>11. Explain Predictive maintenance.</p> <ul style="list-style-type: none"> ✓ It is comparatively a newer maintenance technique. ✓ Equipment conditions are measured periodically or on a continuous basis and this enable maintenance men to take a timely action such as equipment adjustments repair or overhaul.
<p>12. What is predictive maintenance? Predictive maintenance is a maintenance strategy which involves testing and monitoring machines in order to predict machine failure.</p>
<p>13. What are all the types of Replacement problem? Replacement of items (assets) that deteriorate with time. Replacement of items (assets) that breakdown completely. Replacement of items (assets) that become out of date due to new developments.</p>
<p>14. What are the reasons for replacement? Increased cost of operation. Higher scrap and rework cost. Lost in sale. Higher maintenance cost.</p>
<p>15. What are the needs for maintenance? Enhance the safety of work force. Enhance the service reliability of equipment. Improve the quality of a product or service through well maintained equipment.</p>
<p>16. What are the various types of maintenance cost? Down time (idle time) cost due to equipment break time. Cost of spares. Cost associated with maintenance department. Losses due to inefficient operations of machines. Cost associated with equipment replacement.</p>

<p>17. what are the disadvantages in scheduled maintenance? Moderate planning is required. Parts are usually replaced before its end of life. Sometime machines might fail if a part experiences a serious problem period to the next inspection.</p>
<p>18. What are the advantages in preventive maintenance? Better product quality and favor rejections. Long term repair costs are significantly lower when compared to other types of maintenance. Safety is improved due to reduced like hood of incipient failure. Less overtime pay for maintenance personnel.</p>
<p>19. write a short notes on the concept of challenger and defender. The task performed by the defender (existing machine) are no longer necessary. The task performed by the defender (existing machine) are inefficient. The repairing or overhauling of the defender (existing machine) become impossible or unworthy.</p>
<p>20. What are the objectives of plant maintenance? The objective of plant maintenance is to achieve less breakdown and to keep the plant in good working condition at the lower cost. Machines and other facility should be kept in such a condition which permits them to be used at there optimum (profit making) capacity without any interruption.</p>
<p>21. What is the importance of plant maintenance? The importance of plant maintenance varies with the type of plant and its production. Equipment breakdown leads to loss of production. Plant maintenance plays a prominent role in production management.</p>
<p>22. What are the elements of preventive maintenance? There is no read-made on the shelf, preventive maintenance programme for any industry. It must be tailor-made measured and cut to fit the requirement of individual industry or plant. A well-conceived preventive maintenance programme contains the following elements, features or steps.</p>
<p>23. What are the elements get impact of poor maintenance? Production capacity. Production cost. Product and service quality.</p>
<p>24. What are the factors to be considered for replacing equipments? Technical factor. Financial factor.</p>
<p>PART – B</p>
<p>1.(i) List the features of Maintenance. How would you manage maintenance in any sector? (8 marks) (ii) List the causes for replacement of assets in detail. (8 marks)</p>
<p>2.(a) Find the comparative use value of the old machine. (b)Is it advisable to replace the old machine? (b)A machine was purchased two years ago for Rs. 10,000. Its annual maintenance cost is Rs.750. Its life is six years and its salvage value at the end of its life is Rs.1, 000. Now, a company is offering a new machine at a cost of Rs. 10,000. Its life is four years and its salvage value at the end of its life is Rs.4, 000. The annual maintenance cost of the new machine is Rs. 500. The company which is supplying the new machine is willing to take the old machine for Rs. 8,000 if it is replaced by the new machine. Assume an interest rate of 12%, compounded annually.</p>
<p>3. i) How would you show your understanding in finding the economic life of an asset? (8 marks) (ii) How would you use the concept of challenger and Defender in replacement?(8 marks)</p>
<p>4.i) Discuss about Simple probabilistic model for items which fail completely. (8 marks) (ii) Two years ago, a machine was purchased at a cost of Rs.2, 00,000 to be useful for eight years. Its salvage at the end of its life is Rs.25, 000. The annual maintenance cost is Rs. 1, 20,000. Now, a new machine to cater to the need of the present machine is available at Rs. 1, 50,000 to be useful for six years. Its annual maintenance cost is RS. 14,000. The salvage value of the new machine is RS. 20,000. Using an interest rate of 12%, find whether it is worth replacing the present machine with the new machine. (8 marks)</p>
<p>5. i) Explain the types of Replacement. (8 marks) (ii) Compare replacement and maintenance analysis. (8 marks)</p>
<p>6.Challenger and Defender: Two years ago, a machine was purchased at a cost of Rs.2, 00,000 to be useful for eight years. Its salvage value at the end of its life is Rs. 25,000.The annual maintenance cost is Rs.25, 000. The market value of the present machine is Rs. 1, 20,000. Now, a machine to cater to the need of the present machine is</p>

available at Rs. 1, 50,000 to be useful for six years. Its annual maintenance cost is Rs. 14,000. The salvage value of the new machine is Rs. 20,000.

Using an interest rate of 12%, how would you find whether it is worth replacing the present machine with the new machine?

7.(i) Examine the concept of Capital recovery with return. (8 marks)

(ii) A firm is considering replacement of equipment, whose first cost is Rs. 1,750 and the scrap value is negligible at any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs. 100 every year thereafter.

(a) When should the equipment be replaced if $i = 0\%$?

(b) When should the equipment be replaced if $i = 12\%$? (8 marks)

8. Compare the two alternatives and make an annual equivalent cost analysis to determine whether to keep or replace the old engine. A diesel engine was installed 10 years ago at a cost of Rs. 50,000. It has a present realizable market value of Rs. 15,000. If kept, it can be expected to last five years more, with operating and maintenance cost of Rs.14, 000 per year and to have a salvage value of Rs. 8,000 at the end of the fifth year. This engine can be replaced with an improved version costing Rs. 65,000 which has an expected life of 20 years. This improved version will have an estimated annual operating and maintenance cost of Rs. 9,000 and ultimate salvage value of Rs. 13,000. Using an interest rate of 15%, make an annual equivalent

9.(i) A firm is considering replacement of equipment, whose first cost is Rs. 4,000 and the scrap value is negligible at the end of any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs.200 every year thereafter. When should the equipment be replaced if $i = 0\%$? (8 marks)

(ii) When should the equipment be replaced if $i = 12\%$? (8 marks)

10. Can you identify the replacement problem and suggest your idea to eradicate it.

UNIT V DEPRECIATION

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the years digits method of depreciation, sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions – procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.

PART – A

1. Define the term “Depreciation”. .(Nov/Dec 2017)

Depreciation is the process of allocating the acquisition cost of the tangible assets less salvage value, if any, in a systematic and a rational manner over the estimated life of the asset

2. Mention the various method used in depreciation calculation. (Nov/Dec 2017)(April/May 2017)(Nov/Dec 2016)(April/May 2015)

The various methods used in depreciation calculation are:

1. Straight line method
2. Declining method
3. Sum of the years digits method
4. Sinking fund or annuity method
5. Service output method

3 What is service output method of depreciation? .(April/May 2017)

Service output method of depreciation is a type of computing depreciation base on service rendered by an asset

4. Write five reasons for providing depreciation. .(Nov/Dec 2016)

The reasons for providing depreciations are:

- ✓ To know the correct profits
- ✓ To show correct financial position.
- ✓ To make provision for replacement of asset
- ✓ To compute tax liability
- ✓ To decide for show much to buy or sell the assets in the second hand market

<p>5. What is evaluation of public alternatives? .(May/June 2016)(Nov/Dec 2015) Evaluation of public alternatives is nothing but the selecting of best alternative from the available alternatives</p>
<p>6.. Define the term inflation? (May/June 2016)</p> <ul style="list-style-type: none"> ✓ Inflation may be defined as a sustained in the general price level. ✓ It is an economic condition where there is a rise in prices resulting in the fall in the purchasing power of money
<p>7. What is sinking fund?</p> <ul style="list-style-type: none"> ✓ A depreciation fund equal to be actual loss in the value of the asset is estimated for each year. ✓ This amount is invested outside the business in a separate account called sinking fund
<p>8. What is amortization?</p> <ul style="list-style-type: none"> ✓ Amortization is a routine decrease in value of an intangible asset, or the process of paying off a debt over time through regular payments. ✓ Amortization refers to the expensing of intangible capital assets (intellectual property: patents, trademarks, copyrights. Etc.) in order to show their decrease in value as a result of use or passage of time
<p>9. What are the causes of inflation? Excessive printing of currency notes Deficit financing Black money. Increase of wages and salary. Excessive taxation. Fall in production War. Poor government policy.</p>
<p>10. What is sinking fund method of depreciation?</p>
<p>11. What is consumer price index? CPI is widely used to measure the inflation. It measure the cost of consumer goods and services. It is based on prices of food, clothing, shelter, fuel, transportation, medical, college,etc.</p>
<p>12. What are the three level of inflation? Moderate inflation. Galloping inflation. Hyper inflation.</p>
<p>13. what is meant by galloping inflation? This acquire when prices start rising at double or triple digit rates of 20%, 100%, 200% per year. Galloping inflation is the starting point of serious economic distortion.</p>
<p>14. How inflation is controlled? Monetary measure. Fiscal measure (government revenue and expenditure). Direct or non monetary measures.</p>
<p>15. What are the control devices used by RBI to control and regulate the bank credit? Bank rate policy. Variation of reserve ratio. Open market operation. Selective credit control.</p>
<p>16. What is meant by demonetization? Higher denomination rupee notes an be abolished from circulation to control inflation.</p>
<p>17. What are the types of inflation? Creeping inflation. Walking inflation. Running inflation (or) runaway inflation. Credit inflation. Profit inflation. War-time inflation. Demand pull or demand push inflation. Cost push inflation. Suppressed inflation.</p>
<p>18. What is meant by deflation? The deflation occurs when the general level of prices is falling. There will not be sufficient money circulation. Price of commodities will come down. The income of people will decrease.</p>
<p>19. What is benefit-cost (BC) ratio? BC ratio is defined as the ratio of equivalent benefits to the equivalent cost.</p>

<p>20. Mention the procedure to adjust inflation. Convert all investment cost into today's rupees. Modify the above cost using an assumed rate of inflation. Calculate either annual equivalent amounts or future worth amount or present worth amount of cash flow resulting from the above step by considering the value of money.</p>	
<p>21. What are the factor affecting the periodic allocation of depreciation? The depreciated value of an asset is allocated over its economic life on some rational basis i) For new machine Depreciation value = Acquisition cost – estimated scrap value if any. ii) For used machine Depreciation value = Acquisition cost – estimated scrap value – accumulated depreciation up to a given time</p>	
<p>22. write the classification of depreciation. Wear and tear due to operating use. Action of elements like rust, heat or decay. Disaster like accident, earthquake, etc. Poor maintenance and neglect.</p>	
<p>23. What are all the effects of inflation? Prices of the commodities rise during inflation period. Purchasing power of people falls down. Money income of people increase but availability of goods decreases. Everyone starts hoarding goods. There is no correlation between demand and supply.</p>	
<p>24. Define Net National Product (NNP). NNP, as defined as te measure of net output available for consumption by the society. NNP is the real measure of national income. NNP = Gross National Product (GNP) - Depreciation</p>	
<p>PART – B</p>	
1	<p>(i) How would you explain the various methods of depreciation? (ii) Two equipments are purchased each for Rs.12,000/-. The estimated useful life is 5 years for both the estimated scrap value for each equipment is RS.2,000/-. For one equipment the straight line method is used to calculate annual depreciation and for the other equipment, the reducing balance method is adopted. Compare the depreciation charges for both for all the 5years.</p>
2	<p>(i) Explain inflation adjusted decision. (ii) A machine costs Rs.5,00,000/-. Its annual operation cost during the first year is Rs.40,000/- and it increases by Rs.5000/- every year thereafter. The maintenance cost during the first year is Rs.60,000/- and it increases by Rs.6000/- every year thereafter. The resale value of the machine is Rs.4,00,000/- at the end of the first year and it decreases by Rs.50,000/- every year thereafter. Take an interest rate of 20%. Find the economic life of the asset.</p>
3	<p>Himalaya Drug Company has just purchased a capsulating machine for Rs. 10, 00,000. The plant engineer estimates that the machine has a useful life of 5 years and a salvage value of Rs. 10,000 at the end of its useful life. Compute the depreciation schedule for the machine by each of the following depreciation methods :</p> <p>(i) Straight line method of depreciation. (ii) Sum –of-the-year's digits method of depreciation.</p>
4	<p>Analyze if a 40 year old man is planning for his retirement. He plans to retire at the age of 60 and estimates that he can live comfortably on Rs. 24,000 per year in terms of today's rupee value. He can invest his savings at 15% compounded annually. Assume an average inflation rate of 9% for the next 30 years. What equal amount should he save each year until he retires so that he can make withdrawals at the end of each year commencing from the end of the 21st year from now that will allow him to live as comfortably as he desires for 10 years beyond his retirement?</p>
5	<p>(i) Explain the procedure to adjust inflation. (ii) Find the depreciation annuity by annuity method after three years, the initial cost of the machine is Rs.8, 00,000 a salvage value at the end of three years is Rs. 4, 00,000. Rate of interest 10%.</p>
6	<p>How would you evaluate that in a particular locality of a state, the vehicle users take a roundabout route to reach certain places because of the presence of a river? This results in excessive travel time and increased fuel cost. So, the state governments planning to construct a bridge across the river. The estimated initial investment for constructing the bridge is Rs. 40, 00,000. The estimated life of the bridge is 15 years. The annual operation and maintenance cost is Rs. 1, 50,000. The value of fuel savings due to the construction of the bridge is Rs. 6, 00,000 in the first year and it increases by Rs. 50,000 every year</p>

	thereafter till the end of the life of the bridge. Check whether the project is justified based on BC ratio by assuming an interest rate of 12%, compounded annually.
7	<p>(i) Define the difference in evaluating alternatives of private and public organizations.</p> <p>(ii) A company has purchased an equipment whose first cost is Rs. 1, 00,000 with an estimated life of eight years. The estimated salvage value of the equipment at the end of its lifetime is Rs. 20,000. Determine the depreciation charge and book value at the end of the 5th year using the sum-of-the-years-digits method of depreciation.</p>
8	<p>(i) Explain the consideration of the evaluation of the alternative of constructing a bridge across a river. List the different benefits and costs related to this alternative.</p> <p>(ii) How would you compare declining balance method of depreciation and double declining balance method of depreciation?</p>
9	Robert & Co. Purchased Machinery on 1st April 2002 for Rs. 75,000. After having used it for three years it was sold for Rs. 35,000. Depreciation is to be provided every year at the rate of 10% per annum on declining balance method. Accounts are closed on 31st March every year. Find out the profit or loss on sale of machinery.
10	<p>(i) The cost of a machine is Rs. 1, 60,000 and its scrap value is Rs. 40,000. Estimated life 5 years. Using sum of year's digits method, determine depreciation charges for each year. Demonstrate the calculations of the sum-of-the-years-digits method of depreciation. (8 marks)</p> <p>(ii) Two mutually exclusive projects are being considered for investment. Project A1 requires an initial outlay of Rs. 30, 00,000 with net receipts estimated as Rs. 9, 00,000 per year for the next 5 years. The initial outlay for the project A2 is Rs. 60, 00,000, and net receipts have been estimated at Rs. 15, 00,000 per year for the next seven years. There is no salvage value associated with either of the projects. Using the benefit cost ratio, which project would you select? Assume an interest rate of 10%.</p>