



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, August 2020

Course: ECONOMICS AND LIFECYCLE CONCEPTS

Semester: 8th

Program: B.Tech.(ADE)

Time 03 hrs.

Course Code: PME0401

Max. Marks: 100

SECTION A (30 X 1 = 30)

1. MCQ(3X1=3)

- i. The relation that the law of demand defines is.
 - a) Income and price of a commodity
 - b) Price and quantity of a commodity
 - c) Income and quantity demanded
 - d) Quantity demanded and quantity supplied

- ii. What do you mean by a mixed economy?
 - a) Modern and traditional industries
 - b) Public and private sectors
 - c) Foreign and domestic investments
 - d) Commercial and subsistence farming

- iii. The law of demand means?
 - a) As the quantity demanded rises, the price rises
 - b) As the price rises, the quantity demanded rises
 - c) As the price rises, the quantity demanded falls
 - d) As supply rises, the demand rises

2. MCQ(3X1=3)

- i. The law of demand states that, other things remaining the same, the higher the price of a good, the
 - a) Smaller is the demand for the good.
 - b) Smaller is the quantity of the good demanded.
 - c) Larger is the quantity of the good demanded.
 - d) Larger is the demand for the good.

- ii. The demand curve for a good is derived from the:
 - a) Marginal cost of the good.
 - b) Marginal benefit of the good.
 - c) Marginal benefits of the good minus marginal costs of the good.
 - d) Production Possibilities Frontier

- iii. The interaction of supply and demand explains
 - a) Both the prices and the quantities of goods and services.
 - b) The quantities of goods and services but not their prices.
 - c) The prices of goods and services but not their quantities.
 - d) Neither the prices nor the quantities of goods and services

3. MCQ(3X1=3)

- i. In a cost dominated cash flow diagram, which will be assigned with positive sign.
 - a) the costs (outflows)
 - b) profit
 - c) revenue
 - d) salvage value

- ii. In the annual equivalent method of comparison, which will be computed first?
 - a) The annual equivalent cost
 - b) Revenue cost
 - c) Savage cost

- d) Rate of return
- iii. Which is the methods for calculating cash flow/analysis.
 - a) Present worth method
 - b) Future worth method
 - c) Annual equivalent method
 - d) All the above

4. MCQ(3X1=3)

- i. Which is not a type of maintenance activity.
 - a) Breakdown maintenance
 - b) Scheduled maintenance
 - c) Preventive maintenance
 - d) Charted maintenance
- ii. Which is not a main cause of breakdown.
 - a) Failure to replace worn out parts
 - b) Lack of lubrication
 - c) Skilled operator
 - d) Indifference towards minor faults
- iii. What is concerned with prediction of replacement costs and determination of most replacement policy?
 - a) Search theory
 - b) Theory of replacement
 - c) Probabilistic programming
 - d) None of the above

5. MCQ(3X1=3)

- i. Which is not a cause of depreciation is:
 - a) Wear and tear
 - b) Depletion
 - c) Obsolescence
 - d) Profit
- ii. The method which is not used in depreciation calculation is:

- a) Straight line method
 - b) Declining method
 - c) Cash flow analysis
 - d) Service output method
- iii. Amortization is the expensing of intangible capital assets - intellectual property among these which is not a intellectual property
 - a) Patents
 - b) Trademarks
 - c) Policy
 - d) Copyrights.

6. TRUE/FALSE(5X1=5)

- i. The presence of sunk costs can affect future decision-making, if they are large enough.
- ii. If price falls and quantity demanded increases, this is represented by a movement along a given demand curve.
- iii. 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.
- iv. Replacement analysis involves the Replacement of existing obsolete or worn-out assets in order to avoid failure in operations.
- v. Inflation is an economic condition where there is a rise in prices resulting in the fall in the purchasing power of money

7. FILL UP(5X1=5)

- i. In the short run, when the output of a firm increases, its average fixed cost_____.
- ii. _____specifies the purpose of the product or what the product does, what is its utility etc.
- iii. The _____ measures the surplus in an investments project at time zero (0).

- iv. The criterion provide a basis for measuring investment worth by determining equal payments on an annual basis is called_____.
- v. _____of depreciation is a type of computing depreciation base on service rendered by an asset.\

8. MATCH(5X1=5)

- i. Variable cost – invested outside the business
- ii. Simplify the product –break down maintenance
- iii. Net present value method (NPV) - Direct material cost
- iv. Delays in production - value analysis
- v. Sinking fund - rate of return method.

SECTION B (5 X 10 = 50)

- 9. a) Briefly explain the elements of cost and its classification? **(5 Marks)**
- b) Explain about process planning and its various types? **(5 Marks)**

OR

The process-planning engineer of a firm listed the sequences of operations as shown in Table to produce a component.

Table Data

Sequence - Process sequence

- 1. Turning – Milling – Shaping – Drilling
- 2. Turning – Milling – Drilling
- 3. All operations performed with CNC machine.

The details of processing times of the component for various operations and their machine hour rates summarized in Table below

Operation	Machine hour sequence rate in Rs.	Process		
		1	2	3

Turning	200	5	5	-
Milling	400	8	14	-
Shaping	350	10	-	-
Drilling	300	3	3	-
CNC	1000	-	-	8

Find the most economical sequence of operations to manufacture the component.

10. a) A person wishes to have a future sum of Rs. 1,00,000/- for his son's education after 10 years from now. What is the single-payment present worth that he should deposit now so that he gets the desired amount after 10 years? The bank gives 15% interest rate compounded annually. **(5 Marks)**
- b) A company has to replace a present facility after 15 years at an outlay of Rs. 5,00,000/-. It plans to deposit an equal amount at the end of every year for the next 15 years at an interest rate of 18% compounded annually. Find the equivalent amount by Equal-Payment Series Sinking Fund to be deposited at the end of every year for the next 15 years. **(5 Marks)**
11. a) A bank gives a loan to a company to purchase an equipment worth Rs. 10,00,000/- at an interest rate of 18% compounded annually. This amount should be repaid in 15 yearly equal installments. Find the installment amount by Equal-Payment Series Capital Recovery that the company has to pay to the bank. **(5 Marks)**
- b) A person is planning for his retired life. He has 10 more years of service. He would like to deposit 20% of his salary, which is Rs. 4,000, at the end of the first year, and thereafter he wishes to deposit the amount with an annual increase of Rs. 500 for the next 9 years with an interest rate of 15%. Find the total amount at the end of the 10th year by Uniform Gradient Series Annual Equivalent Amount. **(5 Marks)**
12. Alpha Industry is planning to expand its production operation. It has identified three different technologies for meeting the goal. The initial outlay and annual revenues of

Technology 1 are Rs.12,00,000/- and Rs. 4,00,000/- for Technology 2 are Rs. 20,00,000/- and Rs. 6,00,000/- for Technology 3 are Rs. 18,00,000/- and Rs. 5,00,000/- respectively. Suggest the best technology, which is to be implemented based on the present worth method of comparison assuming 20% interest rate, compounded annually. The life is assumed 10 years for all.

13. a) A person is planning new business. The initial outlay and the cash flow for the new business are below. The expected life of the business is 5 years. Find the rate of return of the business, Cash flow for 5 years are Rs.-1,00,000 for first year and Rs.30,000/- for each other years. **(5 Marks)**
- b) At $i = 18\%$, select the best alternative based on future worth method of comparison. If alternatives are A & B with initial investment of 50 lakhs and 45 lakhs respectively. Life is designed to be 4 years and the annual equivalent revenue w.r.t. A & B are 20 lakhs and 18 lakhs respectively. **(5 Marks)**

SECTION C (1 X 20 = 20)

14. a) A diesel engine was installed 10 years ago at a cost of Rs. 50,000/-. It has present market value of Rs. 15,000/-. It can work more for 5 years with maintenance cost of Rs. 14,000/year and salvage value of Rs. 8,000 at end of 5th year. Replace this engine with new engine for Rs. 65,000/- which has an expected life of 20 years. This new engine will have a maintenance cost of Rs. 9,000/- and salvage value of Rs. 13,000/-. Using an interest rate of 15%, make an annual equivalent cost analysis to determine to keep or replace the old engine. **(5 Marks)**
- b) Two years ago, a machine was purchased at a cost of Rs. 2 lakhs to be useful for 8 years. Its salvage value 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 6 years. Its annual maintenance cost is Rs. 14,000/-. The salvage value of the new machine is Rs. 20,000/-. Using an interest rate 12%, find whether it is worth replacing the present machine with the new machine. **(5 Marks)**

- c) The cost of a machine is Rs 1,60,000/- and its scrap value is Rs 40,000/- Estimate life is 3 years .Using sum of years digits method ,determine depreciation charges for each year.(10 marks)

OR

- a) An electronic equipment contains 1000 resistors. When any resistor fails, new resistor replaces it. The cost of replacing the resistor individually is Rs. 10/-. If all the resistor is replaced at once the replacement cost per resistor is Rs. 4/-. The percentage of surviving $S(i)$ at the end of the month(i) is as follows'=0,1,2,3,4,5 & 6 and $S(i)=100,96,89, 68,37,13$ & 0. Which is the optimum plan? (10 marks)
- b) The company has purchased a bus for its officers at Rs.10, 00,000/-, the expected life is 8 years. The salvage value is Rs. 1, 50,000/- at the end of 8th year. Find the following by sinking fund method.(i) Depreciation at the end of 3rd and 5th year.(ii) Book value at the end of 2nd and 6th year. (10 marks)