

KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2024

Marks Scored:

Level : B.ARCH
Year : III

Course : MGTS 305
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 20 DEC 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose and encircle in the most appropriate option from each set of choices

- Economics is the study of
 - choice under conditions of scarcity
 - how society decides what, how, and for whom to produce.
 - production technology
 - the best way to run society
- Which of the following would lead to an INCREASE in the demand for golf balls?
 - A decrease in the cost of producing golf balls.
 - A decrease in the price of golf balls.
 - An increase in average household income when golf balls are a normal good.
 - An increase in the price of golf clubs.
- We have the following demand and supply functions,
Demand: $Q_d = 600 - 30P$, Supply: $Q_s = -300 + 120P$. Equilibrium price and output are
 - $P = \$6$ and $Q = 420$
 - $P = \$10$ and $Q = 300$
 - $P = \$3.33$ and $Q = 500$
 - $P = \$6$ and $Q = 420$
- Suppose that you are willing to pay \$20 to see a movie on Saturday night. A ticket costs \$10, and the next-best alternative use of your time would be to go to dinner with a friend. The cost of the dinner is \$20 and you value the experience of having dinner with your friend at \$60. The opportunity cost of seeing the movie is equal to:
 - \$50
 - \$30
 - \$20
 - \$10
- When the price of a product falls by 10% and its demand rises by 30%, then the elasticity of demand is _____.
 - 30
 - 13
 - 3
 - 10
- A manufacturing process has fixed costs of \$20,000 per year with variable costs of \$15 per unit. If the company sells each unit for \$20, the number of units that must be sold each year in order to reach breakdown is nearest to:
 - 1,000 units
 - 2,000 units
 - 3,000 units
 - 4,000 units
- At 9 percent compounded annually, how long will it take \$200 to quadruple?
 - 16 years
 - 12 years
 - 48 years
 - 8 years
- Which of the following is the term that describes the amount of time taken for a capital budgeting project to recover its initial investment?
 - Investment period
 - Maturity period
 - Redemption period
 - Payback period

18. A machine with a five-year life has a first cost of \$20,000 and \$2,000 salvage value. Its annual operating cost is \$8,000 per year. According to the straight line method, the depreciation charge in year 2 is nearest to:
- a. \$3,600.
 - b. \$4,000.
 - c. \$11,600.
 - d. \$12,000.
19. Equipment with a cost of \$450,000 has an estimated salvage value of \$30,000 and an estimated life of 4 years or 10,000 hours. It is to be depreciated by the units-of-activity method. What is the amount of depreciation for the first full year, during which the equipment was used 2,700 hours?
- a. \$105,000.
 - b. \$112,500.
 - c. \$113,400.
 - d. \$108,750.
20. All of the following are examples of cash inflows except:
- a. Asset salvage value.
 - b. Income taxes.
 - c. Operating cost reduction.
 - d. Construction cost savings.

KATHMANDU UNIVERSITY
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December, 2024

Level : B.ARCH
Year : III
Time : 2 hrs. 30mins.

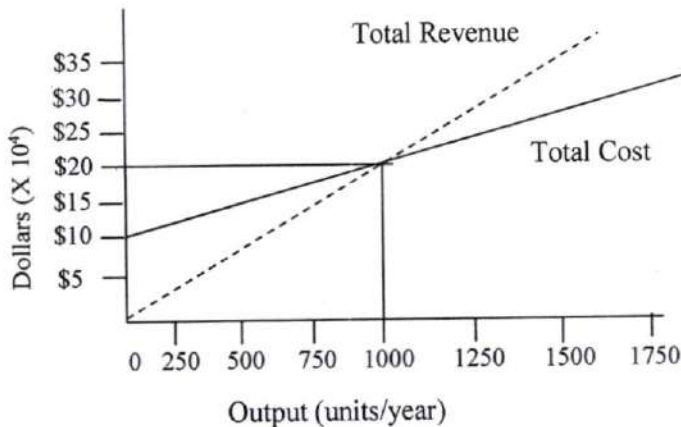
20 DEC 2024

Course : MGTS 305
Semester : I
F. M. : 40

SECTION "B"
[40 marks]

Attempt ALL question. Missing parameters can be assumed suitably.

- 1 a. Differentiate between microeconomics and macroeconomics? Explain why technical managers should have understanding of both microeconomics and macroeconomics. [2]
- b. How would the following events influence this year's demand curve of New Year concert general admission tickets compared to last year's demand curve? Draw a graph with price on the y axis and quantity on the x axis to illustrate your answer. Explain briefly your reasoning noting particular which element of the "all else held equal" condition (e.g. income, preference, etc.) has changed. [3]
- a. Economic growth in Kathmandu over the past year has increased median income by 12%.
 - b. Last Year, the New Year concert was held at the same time, but had no general admission fee. This year it is being held at the same time, but is charging Rs.50 for general admission.
 - c. New security procedures introduced by Government require that every individual entering the concert be thoroughly searched, and prohibit entering with backpacks, strollers, umbrellas, and more than 3 oz. of any liquid or gel.
- c. Consider the accompanying breakeven graph for an investment, and answer the following questions as they pertain to the graph. [3]



- (a) Give the equation to describe total revenue for x units per year.
- (b) Give the equation to describe total costs for x units per year.
- (c) What is the "breakeven" level of x in terms of costs and revenues?
- (d) If you sell 1500 units this year, will you have a profit or loss? How much?

- 2 a. Use the modified internal rate of return approach with an investment rate of 18% per year and a borrowing rate of 10% to find the external rate of return for the following cash flows. [3]

Year	0	1	2	3
Cash flow	+16,000	-32,000	-25,000	+70,000

- b. Consider the following investment projects: [5]

Year	Net Cash Flow		
	Project 1	Project 2	Project 3
0	-\$1000	-\$5000	-\$2000
1	500	7,500	1,500
2	2,500	600	2,000

Assume that MARR = 15%.

(a) Compute the IRR for each project.

(b) On the basis of the IRR criterion, if the three projects are mutually exclusive investments, which project should be selected?

- 3 a. A couple with a newborn daughter wants to save for their child's college expenses in advance. The couple can establish a college fund that pays 7% annual interest. Assuming that the child enters college at age 18, the parents estimate that an amount of \$40,000 per year (actual dollars) will be required to support the child's college expenses for 4 years. Determine the equal annual amounts the couple must save until they send their child to college. (Assume that the first deposit will be made on the child's first birthday and the last deposit on the child's 18th birthday. The first withdrawal will be made at the beginning of the freshman year, which also is the child's 18th birthday.) [3]

- b. A firm is considering three mutually exclusive alternatives as part of a production improvement program. The alternatives are [5]

Alternatives	A	B	C
Installed cost	\$10,000	\$15,000	\$20,000
Uniform annual benefit	\$1,625	\$1,530	\$1,890
Useful life in years	10	20	20

The salvage value at the end of the useful life of each alternative is zero. At the end of 10 years, Alternative A could be replaced with another A with identical cost and benefits. The maximum attractive rate of return is 6%. Which alternative should be selected based on PW method.

- 4 a. Company XYZ is considering an investment of \$100,000. The useful life of the project is 10 years. The cutoff period is three (3) years. The board of directors has identified two alternatives A and B. The expected annual cash flows are as follows: [2+1]

	Alternative A	Alternative B
Initial cost	(\$100,000)	(\$100,000)
Cash flow year 1	\$35,000	\$35,000
Cash flow year 2	\$28,000	\$35,000
Cash flow year 3	\$32,000	\$35,000
Cash flow year 4	\$40,000	\$35,000

- a) Which alternative should be selected based on payback method?
 b) Explain the problems (drawbacks) associated with this method.
- b. Why Benefit- Cost ratio method is important in evaluating public projects? Explain. [1+4]

The town of Oakville is evaluating a proposal that it erect and operate a structure for parking in the downtown area. Numerous design proposals were considered. Data for the two best proposals is presented below.

	Design A	Design B
Cost of site and construction	\$2,220,000	\$1,850,000
Annual revenue from parking fees	765,000	575,000
Annual maintenance cost	\$410,000	\$295,000
Service life	20 years	20 years

At the end of each five year period the parking facility will require a maintenance overhaul. The cost for design A is estimated to be \$650,000 and for design B, \$375,000. At the end of the service life the facility will be torn down and the land sold. Demolition costs and proceeds from the sale of the land are presented below.

	Design A	Design B
Demolition costs	\$530,000	\$550,000
Proceeds from sale of land	530,000	530,000

If the city's interest rate is 10%, determine the B/C ratio of each design proposal.

- 5 a. Explain depreciable property. [1+5]

A firm that has purchased \$150,000 worth of office equipment that qualifies as depreciable property. The equipment is estimated to have a salvage (market) value of \$30,000 (20% of the original cost) after the end of its depreciable life of 10 years. Calculate the asset's depreciation deductions and book values over its depreciable life for:

- a) Straight Line Method
 b) Double Declining Method
 c) Sum-of-the-years' digits (SYD)

- b. Assume that equipment costing \$900,000 has been purchased for use in a sand and gravel pit. [2]
 The pit will operate for 5 years, while a nearby airport is being reconstructed and paved. Then the pit will be shut down, and the equipment removed and sold for \$70,000. Compute the unit-of-production (UOP) depreciation schedule if the airport reconstruction schedule calls for 40,000 m³ of sand and gravel as follows:

Year	Required Sand and Gravel (m ³)
1	4,000
2	8,000
3	16,000
4	8,000
5	4,000

Use following formulas if needed:

Uniform series

$$(F/A, i, N) = \{(1+i)^N - 1\} / i$$

$$(P/A, i, N) = \{(1+i)^N - 1\} / \{i (1+i)^N\}$$

$$(A/F, i, N) = i / \{(1+i)^N - 1\}$$

$$(A/P, i, N) = i(1+i)^N / \{(1+i)^N - 1\}$$

Gradient series

$$(A/G, i, N) = [\{(1+i)^N - iN - 1\} / i \{(1+i)^N - 1\}]$$

$$(P/G, i, N) = [\{(1+i)^N - iN - 1\} / i^2 (1+i)^N]$$

$$(P/A_1, g, i, N) = [\{1 - (1+g)^N (1+i)^{-N}\} / (i - g)] \text{ if } i \neq g$$

$$(P/A_1, g, i, N) = \{N / (1+i)\} \text{ if } i = g$$