



Sample Question Format
(For all courses having end semester Full Mark=50)

KIIT Deemed to be University
Online End Semester Examination(Spring Semester-2021)

Subject Name & Code: Engineering Economics and HS2002
Applicable to Courses: B.Tech

Full Marks=50

Time:2 Hours

SECTION-A(Answer All Questions. Each question carries 2 Marks)

Time:30 Minutes

(7×2=14 Marks)

<u>Q.No:1</u>	An indifference curve is -----. (a) a straight line sloping downwards (b) parallel to X-axis (c) convex to the origin (d) none of the above	CO1	(c)
	When marginal utility derived from consuming the 4th avocado is - 2, the total utility must be -----. (a) increasing (b) decreasing (c) maximized (d) negative as well	CO1	(b)
	The parallel shift of a demand curve towards right due to a change in the other factors price remaining constant -----. (a) change in quantity demand (b) change in demand (c) increase in demand (d) decrease in demand	CO1	(c)
	The good whose quantity demand increases due to an increase in the price of other good -----. (a) normal good (b) inferior good (c) substitute good (d) complimentary good	CO1	(c)
<u>Q.No:2</u>	Quantity demand for a commodity is 500 units when its price is ₹ 10 per unit. If quantity demand for the commodity decreases to 400 units due to a rise in the price to ₹ 15, then price elasticity of demand is-----. (a) 0.5 (b) 0.9 (c) 0.4 (d) 1.2	CO1	(c)
	If quantity demand for coffee increases from 50,000 units to 60,000 units due to a rise in the price of tea per 500 gram increases from ₹ 1000 to ₹ 2000, then cross elasticity of demand between tea and coffee is -----.	CO1	(a)

		(a) 0.2 (b) 0.6 (c) 0.5 (d) 0.9		
		Degree of elasticity of demand for luxurious good is -----. (a) infinity (b) >1 (c) <1 (d) 0	CO1	(b)
		When there is no change in quantity demand for a commodity due to a change in its price, it is called -----. (a) perfectly elastic demand (b) relatively inelastic demand (c) relatively elastic demand (d) perfectly inelastic demand	CO1	(d)
<u>Q.No:3</u>		The marginal product curve and average product curve intersects -- -----. (a) where MP equals zero (b) Where TP is at a maximum (c) at the maximum point of AP curve (d) at the maximum point of MP curve <i>NB:</i> TP = Total product MP = Marginal product AP = Average product	CO1, CO2	(c)
		In the Law of variable proportion, second stage ends and third stage starts where -----. (a) MP is zero (b) AP is zero (c) MP is maximum (d) AP is maximum <i>NB:</i> TP = Total product MP = Marginal product AP = Average product	CO1, CO2	(a)
		Given the production function $Q = \sqrt{LK}$ The return to scale the above production function shows is ----- ---. (a) increasing return to scale (b) decreasing return to scale (c) constant return to scale (d) none of these	CO1, CO2	(c)
		The curve which shows various combination of two factor produces equal level of output is -----. (a) iso-cost line (b) isoquant (c) isoc line (d) budget line	CO1, CO2	(b)
<u>Q.No:4</u>		The ATC equal the -----. (a) TC - Q (b) AFC/AVC (c) AFC - AVC (d) AFC + AVC <i>NB:</i> Q = Total output TC = Total cost	CO1, CO2	(d)

		AFC = Average fixed cost AVC = Average variable cost		
		The short-run cost curve which continues to decrease as output increases is -----. (a) AVC (b) AFC (c) MC (d) AC NB: MC = Marginal cost AC = Average cost	CO1, CO2	(b)
		If fixed cost of a company is ₹ 20,000, selling price per unit is ₹ 100 and variable cost per unit is ₹ 60, then Break-even point(BEP) in units is -----. (a) 600 (b) 500 (c) 400 (d) 700	CO1, CO2	(b)
		The point where TR is equal to TC, is called -----. (a) BEP (b) margin of safety (c) profit point (d) contribution per unit NB: TR = Total revenue TC = Total cost	CO1, CO2	(a)
Q.No:5		A producer earns TR of ₹ 1,00,000 by selling 10 units of a commodity. If the producer earns TR of ₹ 1,10,000 by selling 11 units of the commodity, then MR is -----. (a) 11,000 (b) 10,000 (c) 1000 (d) 1100 NB: MR = Marginal revenue	CO1, CO2, CO3	(b)
		If price of a commodity is ₹ 15 and coefficient of elasticity is 3, then MR is -----. (a) 5 (b) 10 (c) 15 (d) 20	CO1, CO2, CO3	(c)
		The type of market where there is no restriction for the new firms to enter into the industry, produce and sell uniform products like other firms-----. (a) Oligopoly (b) Monopoly (c) Perfect competition (d) None of the above	CO1, CO2, CO3	(c)
		A firm under perfectly competitive market charges a price that is -----. (a) different to other firms, depending on the situation (b) lower than other firms (c) higher than other firms (d) similar to other firms	CO1, CO2, CO3	(d)
Q.No:6		A person deposits ₹ 6,00,000 in a bank at 8% interest rate for 7 years. If the compounding is half yearly, then the maturity amount of his account after 7 years is -----. (a) 7,20,345.67 (b) 6,50,897.43 (c) 8,00,000 (d) 1,039,005.868	CO1, CO2, CO3	(d)
		A person needs ₹ 50,00,000 after 20 years. If the interest rate is 7% compounded annually, then the equal amount the person should deposit at the end of every year is-----.	CO1, CO2, CO3	(b)

		(a) 2,50,789.990 (b) 1,21,964.628 (c) 3,35,000.002 (d) 4,20,645.76		
		A company takes a loan of ₹ 20,00,000 for 20 years. If the interest rate is 11% compounded annually, then the equal amount of money the company has to repay at the end of every year is-----. (a) 2,51,151.273 (b) 3,49,507.78 (c) 4,03,506.008 (d) 4,50,980.345	CO1, CO2, CO3	(a)
		If a person invests equal sum of ₹ 30,000 at the end of every year with 9.5% for 30 years, then the maturity amount of her account after 30 years will be-----. (a) 50,00,000 (b) 41,56,000 (c) 44,90,625.065 (d) 60,00,000	CO1, CO2, CO3	(c)
<u>Q.No:7</u>		The correct expression for GNP_{FC} is -----. (a) $GNP_{MP} - NIT$ (b) $NDP_{MP} + NFIA$ (c) $NNP_{MP} - Depreciation$ (d) $GDP_{MP} + NFIA$ <i>NB:</i> GDP_{MP} = Gross Domestic product at market price GNP_{MP} = Goss National Product at market price NDP_{MP} = Net Domestic Product at market price NNP_{MP} = Net National Product at market price $NFIA$ = Net Factor Income from Abroad NIT = Net Indirect Tax	CO1, CO2, CO3	(a)
		The correct expression for NNP_{FC} is-----. (a) $GNP_{MP} - NIT$ (b) $NDP_{MP} + NFIA$ (c) $GDP_{MP} + NFIA$ (d) $GNP_{FC} - Depreciation$ <i>NB:</i> NNP_{FC} = Net National Product at Factor Cost	CO1, CO2, CO3	(d)
		Bank rate is the rate at which..... (a) Reserve Bank of India takes loan from commercial banks (b) commercial banks takes loan from the Reserve Bank of India (c) both commercial banks and Reserve bank of India gives loan to each others (d) commercial banks provide loan to consumers	CO1, CO2, CO3	(b)
		The instrument of fiscal policy through which Reserve Bank of India controls inflation in the country is -----. (a) credit control (b) open market operation (c) increase in bank rate (d) increase in tax	CO1, CO2, CO3	(d)

SECTION-B(Answer Any Three Questions. Each Question carries 12 Marks)

Time: 1 Hour and 30 Minutes

(3×12=36 Marks)

<u>Question No</u>	<u>Question</u>	<u>CO Mapping (Each question should be from the same CO(s))</u>
		CO2, CO3

Q.No:8

(a) Students will have to explain the Law of variable proportion with suitable diagrams.

(b) From the following table find out total fixed cost(TFC), total variable cost(TVC), average total cost(ATC), average fixed cost(AFC), average variable cost(AVC) and marginal cost(MC).

Q	TC	TFC	TVC	ATC	AFC	AVC	MC
0	125						
10							5
20				10.5			
30			110				
40	255						
50						3	
60							3
70				5			
80			295				

Answer

Q	TC	TFC	TVC	ATC	AFC	AVC	MC
0	125	125	0	-	-	-	-
10	130	125	5	13	12.5	0.5	5
20	210	125	85	10.5	6.25	4.25	80
30	235	125	110	7.833	4.166	3.666	25
40	255	125	130	6.375	3.125	0.75	20
50	275	125	150	5.5	2.5	3	20
60	278	125	153	4.633	2.083	2.55	3
70	350	125	225	5	1.785	3.214	72
80	420	125	295	5.25	1.562	3.687	70

(a) A company has the following short-run production function:

$$Q = L^{0.75}K^{0.25} \text{ (Where Q is the output and L is the labour and K is the capital)}$$

(i) Find the Marginal product(MP) function and average product function of labour

(ii) If the fixed quantity of capital in the short-run equals 10,000 units, what is the short-run product function?

(iii) Show that marginal product of labour(MP_L) is less than average product of labour in the short-run production function as per the question (ii) above.

Answer

(i) $MP_L = 0.75(K/L)^{0.25}$

$$AP_L = 0.25(L/K)^{0.75}$$

(ii) $10L^{0.75}$

(iii) $MP_L = 7.5/L^{0.25}$, $AP_L = 10/L^{0.25}$

So we find $MP_L < AP_L$ as per the above answer.

(b) Students will have to write about the short-run average cost curves

and draw the respective diagrams.

(a) A monopolist has the following demand and cost functions. Find out the level of output at which monopolist has maximum profit and find out the maximum profit.

$$TC = 600 + 30Q^2$$

$$P = 500 - 20Q$$

Answer

Q = 5 at which monopolist has maximum profit

Maximum Profit = 650

(b) If a manufacturer sells his product at ₹ 5 each. Variable cost is ₹ 2 per unit and the fixed cost is ₹ 60,000, find out the followings:

(i) Break-even point(BEP)

(ii) P/V ratio

(iii) profit when the firm sells 30,000 units

Answer

(i) BEP(in units) = 20,000

$$BES = 1,00,000$$

(ii) P/V ratio = 60%

(iii) Profit = 30,000

Q.No:9

(a) A company has to choose a best alternative . From the following information find out which alternative will be selected on the basis of present worth method if the interest rate is 12% compounded annually.

Particulars	Alternative A	Alternative B	Alternative C
Initial outlay(in)	1,00,00,000	1,20,00,000	1,10,00,000
Life of the alternatives(in years)	8	8	8
Annual revenue(in)	25,00,000	30,00,000	28,00,000
Salvage value(in)	1,00,000	50,000	30,000

Answer

$$NPW_A(12\%) = 24,19,000$$

$$NPW_B(12\%) = 29,02,800$$

$$NPW_C(12\%) = 29,09,280$$

Alternative C will be selected.

(b) A company is planning to expand its business activities. It has two alternatives for the expansion programme and the corresponding cash flows are tabulated below. Each alternative has a life of 5 years and a negligible salvage value. The minimum attractive rate of return(MARR) for the company is 15%. Suggest the best alternative to the company.

Particulars	Alternative 1	Alternative 2
Initial outlay(in)	5,00,000	1,70,000
Annual equal revenue(in)	8,00,000	2,70,000

Answer

CO2, CO3, CO4

IRR for alternative 1 lies in between 20% and 22%.

IRR = 20.78%

IRR for alternative 2 lies in between 20% and 22%.

IRR = 20.435%

Student will get the grace mark.

(a) A company invests in one of the two mutually exclusive projects. The life of both projects is estimated to be 10 years. Find out the best project for the company with the help of future worth method if i is 12% compounded annually.

Project	Initial investment(in)	Annual maintenance cost(in)	Salvage Value(in)
A	8,00,000	1,50,000	50,000
B	6,00,000	1,20,000	30,000

Answer

$NFW_A(12\%) = 50,66,977$

$NFW_B(12\%) = 39,39,384$

(b) One project is to be selected out of two mutually exclusive projects. Project A requires an initial cost of ₹ 1,00,00,000 with net annual earnings estimated as ₹25,00,000 per year for the next 8 years. The initial cost of Project B requires ₹ 1,20,00,000 with estimated annual earning as ₹ 40,00,000 per year for the next 8 years. Find out which project will be selected with the help of benefit-cost analysis if the interest rate is 12% compounded annually.

Answer

$(B/C)_A = 1.24$

$(B/C)_B = 1.65$

Project B will be selected

(a) A company will invest in one of the two following alternatives. From the following information find out which alternative the company should select on the basis of annual worth method if the interest rate is 15% compounded annually.

Particulars	Alternative A	Alternative B
Initial Cost(in)	20,00,000	22,50,000
Life of the alternatives(in years)	5	5
Annual equal return(in)	6,00,000	7,00,000
Salvage value((in)	1,50,000	3,50,000

Answer

$NAW_A(15\%) = 25,645$

$NAW_B(15\%) = 80,711.5$

Alternative B will be selected

(b) The state Government has to select a best project. The initial investment in project 1 will be ₹ 8,00,00,000 with estimated annual equal return of ₹ 80,00,000 every year for 15 years. The initial investment in project 2 will be ₹ 5,00,00,000 with estimated annual equal return of ₹ 1,00,00,000 every year 15 years. Find out which project should be selected by the Government on the

basis of BC ratio if interest rate is 16% compounded annually.

Answer

$$(B/C)_A = 0.27$$

$$(B/C)_B = 1.11$$

Project B will be selected

Q.No:10

(a) A company has to choose a best project out of alternative projects. Find out which project will be selected on the basis of present worth method if the interest rate is 12% compounded annually.

Particulars	Project A	Project B	Project C
Initial Cost(in ₹)	17,00,000	15,00,000	20,00,000
Life of the project(in years)	20	20	20
Annual operation and maintenance cost(in ₹)	2,50,000	3,00,000	4,20,000
Salvage value(in ₹)	5,000	7,000	8,000

Answer

$$NPW(i\%) = P + A[(1+i)^{20} - 1/i(1+i)^{20}] - S[1/(1+i)^{20}]$$

$$NPW_A(12\%) = 35,67,879.23990 \text{ or } 35,66,842.572$$

$$NPW_B(12\%) = 37,40,107.419$$

$$NPW_C(12\%) = 51,36,336.988$$

Project A will be selected as annual operation and maintenance cost is less.

(b) A machine has been purchased at ₹ 3,00,000 with estimated salvage value of ₹ 30,000 at the end of its service life of 12 years. Find out depreciation amount and book value of the machine for various years with the help of straight line method of depreciation.

Answer

Year	Depreciation(I-S/N)	Book value($B_{t-1} - D_t$)
0	----	3,00,000
1	22,500	2,77,500
2	22,500	2,55,000
3	22,500	2,32,500
4	22,500	2,10,000
5	22,500	1,87,500
6	22,500	1,65,000
7	22,500	1,42,500
8	22,500	1,20,000
9	22,500	97,500
10	22,500	75,000
11	22,500	52,500
12	22,500	30,000

(a) A company is planning to purchase a machine on installment. Find out

CO4, CO5, CO6

which machine should be selected on the basis of Annual Worth method if the interest rate is 18% compounded annually.

Particulars	Machine A ₁	Machine A ₂	Machine A ₃
Initial Cost(in ₹)	2,00,000	2,80,000	3,60,000
Life of the project(in years)	15	15	15
Annual earnings(in ₹)	5,00,000	7,00,000	6,00,000
Salvage value(in ₹)	10,000	8,000	6,000

Answer

$$NAW(i\%) = -P[i(1+i)^n/(1+i)^n - 1] + A + S[i/(1+i)^n - 1]$$

$$NAW_{A1}(18\%) = 4,60,886$$

$$NAW_{A2}(18\%) = 6,45,141.8$$

$$NAW_{A3}(18\%) = 5,29,398$$

Machine A₂ will be selected.

(b) The initial value of an asset is ₹ 20,00,000. Find out depreciation amount and book value of the asset for every year if the estimated life of the asset is 6 years with the help of declining balance method of depreciation if the rate of depreciation is 20%.

Year	Depreciation($D_t = KB_{t-1}$)	Book value($B_{t-1} - D_t$)
0	-----	20,00,000
1	400000	16,00,000
2	320000	12,80,000
3	256000	10,24,000
4	204800	8,19,200
5	163840	6,55,360
6	131072	5,24,288

(a) A company wants to purchase a machine. There are two machines available in the market i.e. machine A and machine B whose initial cost is 10,00,000. Find out which machine will be selected with the help of pay-back period method.

Year	Cash inflows from Machine A(in ₹)	Cash inflows from Machine B(in ₹)
1	2,00,000	2,00,000
2	3,50,000	4,50,000
3	4,00,000	5,20,000
4	5,80,000	6,00,000
5	8,00,000	7,50,000
6	9,50,000	8,80,000

Answer

Pay-back-period for machine A = The remaining amount / Next cash inflow X 12

$$= 3 \text{ years } 2 \text{ month}$$

Pay-back-period for machine B = 2 years 9 month

	<p>Machine B will be selected</p> <p>(b) An equipment is purchased at ₹ 4,00,000 with estimated salvage value of ₹ 50,000 at the end of its service life of 5 years. Find out depreciation and book value for various years with the help of sum-of-the-year-digit method of depreciation.</p> <table> <tr> <th>Year</th><th>Depreciation [$D_t = \frac{\text{Rate(I-S)}}{\text{Rate(I-S)}}$]</th><th>Book value ($B_{t-1} - D_t$)</th></tr> <tr> <td>0</td><td>----</td><td>4,00,000</td></tr> <tr> <td>1</td><td>116666.6667</td><td>2,83,333</td></tr> <tr> <td>2</td><td>93333.33333</td><td>1,90,000</td></tr> <tr> <td>3</td><td>70000</td><td>1,20,000</td></tr> <tr> <td>4</td><td>46666.66667</td><td>73,333</td></tr> <tr> <td>5</td><td>23333.33333</td><td>50,000</td></tr> </table>	Year	Depreciation [$D_t = \frac{\text{Rate(I-S)}}{\text{Rate(I-S)}}$]	Book value ($B_{t-1} - D_t$)	0	----	4,00,000	1	116666.6667	2,83,333	2	93333.33333	1,90,000	3	70000	1,20,000	4	46666.66667	73,333	5	23333.33333	50,000	
Year	Depreciation [$D_t = \frac{\text{Rate(I-S)}}{\text{Rate(I-S)}}$]	Book value ($B_{t-1} - D_t$)																					
0	----	4,00,000																					
1	116666.6667	2,83,333																					
2	93333.33333	1,90,000																					
3	70000	1,20,000																					
4	46666.66667	73,333																					
5	23333.33333	50,000																					
Q.No:11	<p>a) What do you mean by inflation? Explain the causes of inflation.</p> <p>(b) (i) What do you mean by GNP? Explain how GNP is different from NNP.</p> <p>(ii) From the following information find out GNP_{MP}, GNP_{FC} and NNP_{FC}</p> <p>Net indirect taxes - 25 crore NFIA - 60 crore Consumption of fixed capital (Depreciation) - 20 crore GDP_{MP} - 300 crore</p> <p>Answer</p> <p>(a) Students have to write the definition of inflation and explain the causes of inflation.</p> <p>(b) (i) Students have to write the definition of GNP and explain how GNP is different from NNP.</p> <p>(ii) $GNP_{MP} = GNP_{MP} + NFIA = 360$ crore $GNP_{FC} = GNP_{MP} - NIT = 335$ crore $NNP_{FC} = GNP_{MP} - NIT - \text{Depreciation} = 315$ crore</p>	CO4, CO5, CO6																					
	<p>(a) Explain different policies of the Government to control inflation.</p> <p>(b) (i) What do you mean by NDP? Distinguish between GDP and NDP.</p> <p>(ii) From the following information find out GNP_{MP}, NNP_{MP} and NNP_{FC}</p> <p>Indirect taxes - 50,000 crore Subsidy - 7500 crore Depreciation - 8500 crore NFIA - 15,000 crore NDP_{MP} - 3,80,000 crore</p> <p>Answer</p>																						

(a) Students will have to write the meaning of inflation and explain different policies of the Government to control inflation.

(b) (i) Students have to write the meaning of NDP and write the differences between GDP and NDP.

(ii) $GNP_{MP} = GDP_{MP} + NFIA$

$GDP_{MP} = NDP_{MP} + Depreciation = 3,88,500$

$GNP_{MP} = GDP_{MP} + NFIA = 4,03,500$

$NNP_{MP} = GNP_{MP} - Depreciation = 3,95,000$

$NNP_{FC} = GNP_{MP} - NIT - Depreciation = 3,37,000$

(a) Explain different quantitative methods of Reserve bank of India to control inflation.

(b) (i) What do you mean by NDP? Distinguish between NDP and NNP.

(ii) From the following information find out GNP_{MP} , GNP_{FC} and NNP_{FC}

Net indirect taxes - 50 crore

NFIA - 180 crore

Consumption of fixed capital(Depreciation) - 60 crore

GDP_{MP} - 900 crore

Answer

(a) Students have to explain different quantitative methods of Reserve bank of India to control inflation.

(b) (i) Students have to write meaning of NDP and explain the difference between NDP and NNP.

(ii) $GNP_{MP} = GDP_{MP} + NFIA = 1080$ crore

$GNP_{FC} = GNP_{MP} - NIT = 1030$ crore

$NNP_{FC} = GNP_{MP} - NIT - Depreciation = 970$ crore