2024

discount and the FYUGP (PDUYT) the function

(2nd Semester)

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COMMERCE

(Interdisciplinary Paper)

al Solve the following system of equations, .4

4x - 3u + 2z = 4

Paper Code : IDP-2/BM

(Basic Mathematics)

Full Marks: 37½ Pass Marks: 40%

Time: 2 hours a for the total specific the total sp

(PART : B—DESCRIPTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

3. (a) Find the point of local maxima and local

 (a) What are functions? Write about the different types of functions. Graphically represent any two functions. 1+2+2=5

Or

(3)

What are limits? Find the relationship between a and b, so that the function fdefined by semested bas)

$$f(x) = \begin{cases} ax+1, & \text{if } x \le 3 \\ bx+3, & \text{if } x > 3 \end{cases}$$

is continuous at x = 3.

Pass Marks: 40%

2+3=5

Solve the following system of equations, using matrix inversion method:

(Interdisciplinary Paper

$$3x-2y+3z=8$$

$$2x+y-z=1$$

$$4x-3y+2z=4$$

Time : 2 hours

Solve the following system of equations, using Cramer's rule:

$$x+y-z=6$$

$$3x-2y+z=-5$$

$$x+3y-2z=14$$

(a) Find the point of local maxima and local minima for the equation

for the questions

minima for the equation
$$f(x) = x^4 - 62x^2 + 120x + 9$$
5

Full Marks: 371/2

(b) A manufacturer's requirement for a raw material is 2000 units per year. This ordering cost is ₹ 10 per order while carrying cost is 16 paisa per year per unit of average inventory. The purchase price of raw material is ₹ 1 per unit. Find the economic order quantity and the total inventory cost.

A company manufactures x units of one item and y units of another. The total cost in dollars, C, of producing these two items is approximated by the function we rate per wenother in

$$C = 5x^2 + 2xy + 3y^2 + 800$$

(i) If the production quota for the total number of items (both types combined) is 39, find the minimum production cost.

(ii) Estimate the additional production cost or savings if the production quota is raised to 40 or lowered to 38.

Or

Solve:

21/2×2=5

3

2

(i)
$$\int \frac{x}{(x+1)(x+2)} dx$$

24L/936a

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(Continued)

24L/936a

(ii)
$$\int \frac{2x}{1+x^2} dx$$

5. (a) To prepare for her future, she deposits \$24,000 at the end of each year for 7 years in an account paying 6% compounded annually. How much will she have on deposit after 7 years?

0-

- (b) Express the interest rate of 6.5% per semiannual period compounded weekly in the following forms: 2+1+1+1=5
 - (i) Effective rate per week
 - (ii) Effective yearly rate

(ii) Estimate the additional production

quota is raised to 40 or lowered

- (iii) Effective rate per semiannual period
- (iv) Effective rate per quarter

3. (a) Find the point of local maxima and local

cost of ** * if the production

Solve: $f(x) = x^4 - 62x^2 + \frac{1}{2}x + \frac{1$

(b) The range of f(x) 4 2.0 2.2

(FYUGP) (C.O)

(2nd Semester) [a,0] (ii)

(iv) None of COMMERCE [2,1] (vi)

(Interdisciplinary Paper) (g) If x is real, then find the minimum value of

Paper Code : IDP-2/BM

(Basic Mathematics) (iii) is a decreasing function

(PART : A—OBJECTIVE)

(d) Let A and B be nxn matrices such that BA + B = 1 - (Marks : 121/2) - 1 = 8 + AB

matrix. Which of the following is always true?

The figures in the margin indicate full marks for the questions

1. Put a Tick (/) mark against the correct answer in the brackets provided: relignization et 8.4 A (1111/2×15=71/2) or gain expected from the second-

(a)
$$\lim_{x \to 3} \frac{x-3}{x^2 - 2x - 3}$$
 is $\lim_{x \to 3} \frac{x-3}{x^2 - 2x - 3} = yx + x$ but $0 = yx - x$ (a)

- of a the system has infinitely many ool in ions?

 - (ii) 1 port (ity) cost () 0 = 3 (ii) 0 = 3 (iii) 0 = 3 (iii) 0 = 3 (iii) 0 = 3 (iii) 0 = 3
 - (iv) None of the above (2)

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(b)	The	range	of $f(x) = \sqrt{x}$	$25-x^2$	is

- (0, 5)(FYU(PP)
- [0, 5]
- (-5, 5)
- (iv) [1, 5] COMMERCE

(c) Let
$$f: R \to R$$
 be defined by $f(x) = 2x + \cos x$, then f

- has a minimum at $x = \pi$
- has a maximum at x = 0
- is a decreasing function
- is an increasing function

(d) Let A and B be $n \times n$ matrices such that $BA + B^2 = I - BA^2$, where I is the $n \times n$ identity matrix. Which of the following is always true?

- (i) A is nonsingular ()
 - (ii) B is nonsingular 1. Put a Tick (A) mark ag
- AT = (iii) A + B is nonsingular : be (vo) atendand
 - (iv) AB is nonsingular
 - (e) 2x-3y=0 and $2x+\alpha y=0$, for what value of a the system has infinitely many solutions?
 - $\alpha \neq 3$
 - $\alpha = -3$
 - (iii) $\alpha = 2$
 - None of the above) (iv) $\alpha = -2$

(f)	For	matrix A	$A^3 =$	I, A^{-1}	is equal	to
0/	2 02		THE PARTY	APPENDING TO THE	m IZMO S	CHI SECLEEMS.

- (i) A² sest t(or)rin.) muminim (i)
- equal to the cost of ordering 2-A (ii) cost of over-stocking
 - (iii) Cannot say
 - (iv) None of the above

(g) If x is real, then find the minimum value of
$$3x^2-2x+8$$
.

- (i) 23 p-sum consideration against which are granted is 92 (iii)
- Community surplus equals
- surplus liminis 25 onsumer
- (ii) profits plus utility total utility minus (bus) profit (vi) surplus plus producer

(h) The income or gain expected from the secondbest use of resources lost due to the best use of the scarce resources is known as

(i) producer

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surplus

- marginality principle
- opportunity cost
- incremental principle
- equimarginal principle (x) (x)

(i) Economic order quantity is the quantity at which the cost of carrying is (i) minimum (i)	(m) Find the points on the plane $x+y+z=9$ which are closest to origin.
(ii) equal to the cost of ordering ()	(i) (3, 3, 3)
(iii) cost of over-stocking () (iv) None of the above	(ii) What are bounded func (87,1,2) (ii)
(i) If $V = e^{xyz}$, then $\frac{\partial^3 u}{\partial x \partial y \partial z}$ at $(1, 1, 1)$ is	(iii) (2, 2, 2) ()
The state of the s	(iv) (3, 4, 1) ()
(i) Se () 3e ()	(n) A lump-sum consideration against which
(iii) 2e () (28)	annuity payments are granted is
(iv) 4e () (k) Community surplus equals	(i) annuity value ()
(i) producer surplus minus consumer	(ii) present value ()
(ii) profits plus utility	(iii) future value ()
(iii) total utility minus plus profit	(iv) None of the above ()
(10) consumer surplus plus	
de la character de la company	(o) "Depreciation is the gradual and permanent
(1) If $\frac{d}{dx}(f(x))$ is $g(x)$, then the antiderivative of $g(x)$	decrease in the value of an asset from any cause." Whose definition is it?
$\epsilon y = 3y = 0$ and $2x + \alpha y = 0$, for what value	cause. Whose dominate
of (i) the (x) yslem halginning will an ignorm lutions?	(i) Carter ()
(ii) opportunity cost () $(x)^{n}$ (ii)	(ii) Williams ()
(iii) incremental princi(le) ((x)'g (iii)	
(iv) $f(x) + g(x)$	(iii) Spicer ()
	(iv) Coffer ()
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IDP-2/ IDP-2/BM (CP)/936 2. Answer the following questions in short: $1\times5=5$

(a) (i) Differentiate between even and odd functions.

(ii) What are bounded functions?

If $V = e^{xyz}$, then $\frac{\partial^2 u}{\partial x \partial y \partial z}$ at (1, [2, 3, 2]) (iii)

(iv) (3, 4, 1)

(n) A lump-sum consideration against which annuity payments are granted is

(iv) 4e ()

Community surplus surplus (i)

(i) preducer() present value usus (ii) evique (ii) evique

(iii) future value villity sulg stilorq (iii)

(iii) total utility misveds last lo snot (iii)

full concurred annelse

(o) "Depreciation is the gradual and permanent

decrease in the value of an asset from any

(i) Carter (ii) (iii)

(ii) f'(x) () emission (iii)

(ii) a'(x) (iii)

(iii) Spicer () spicer (iii)

fip) Coffer ()

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(b) (i) Mention about the algebra of matrices.

(ii) What is the condition required for inverse of a matrix to exist?

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(c) (i) What do you mean by economic order quantity? o and odd

(ii) What is the Ondition required for inverse (ii) What is product rule in differentiation? (d) Differentiate between definite and indefinite integration.

Differentiate between consumer's and producer's surplus.

(e) (i) What do you mean by deferred annuities? (c) (i) What do anotterpatri oficilabatic order

(ii) What is productifully suborpliation?

(ii) Define compounding.