SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF COMMERCE

INTERNAL TEST (Academic Year 2024)

Name of the Course : B.Sc(H) Maths
Name of the Paper : LPP and Applications
Duration : 1 hr 30 Minutes
Date of Test : 15/04/2024

Semester: ..... VI th (Section - B)
Faculty Name: Ankush kumar
Maximum Marks: 10

Attempt any two questions!

Q1 (i) Find all basic feasible sol^n of the eq^{n}s!

$$x_1 + 2x_2 + 4x_3 + x_4 = 7$$
$$2x_1 - x_2 + 3x_3 - 2x_4 = 4$$

(ii) Let X and Y be two convex set in $\mathbb{R}^1$, then for any scalars α, β s.t $\alpha X + \beta Y$ is also convex.

Q2 (i) Solve by graphical method of the following L.P.P –

$$\max Z = 0.75x_1 + x_2$$
$$\text{s.t} \quad x_1 - x_2 \geq 0$$
$$-0.5x_1 + x_2 \leq 1$$
$$\& \; x_1, x_2 \geq 0$$

(ii) Find the inverse of A, By using Simplex Method –

$$A = \begin{bmatrix} 5 & 2 \\ 2 & 1 \end{bmatrix}$$

Q3 Solve the following L.P.P by Two Phase Method –

$$\max Z = -x_1 + 3x_2$$
$$\text{s.t}$$
$$x_1 + x_2 \geq 1$$
$$-2x_1 + 3x_2 \leq 6$$
$$\& \; x_1, x_2 \geq 0$$

Faculty Signature:
(Ankush kumar)

SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF COMMERCE

INTERNAL TEST (Academic Year 2024.)

Name of the Course : B.Sc (H) Maths
Name of the Paper : L.P.P and Applications
Duration : 1 hr
Date of Test : 08/04/2024

Semester: ..... VIth (Section-A)
Faculty Name: Ankush Kumar
Maximum Marks: 10

Attempt any two questions:

Q1(i) Seal the following LPP by graphical method:

$$\min Z = 3x_1 + 5x_2$$

$$\text{s.t} \quad -3x_1 + 4x_2 \leq 12$$
$$2x_1 - x_2 \geq -2$$
$$2x_1 + 3x_2 \geq 12$$
$$x_1 \leq 4, \; x_2 \geq 2$$

and $x_1, x_2 \geq 0$

(ii) Shows that the set $S = \{(x_1, x_2) \mid 3x_1^2 + 2x_2^2 \leq 6\}$ is Convex.

Q2 Let $x_1 = 1, x_2 = 1, x_3 = 1$ be a feasible solution to the system of equations: $x_1 + x_2 + 2x_3 = 4$

$$2x_1 - x_2 + x_3 = 2$$

Is this a B.F.S? If not, reduce it to two different basic feasible solutions.

Q3 Solve the following L.P.P by Big-M method-

$$\max Z = -x_1 - x_2 + x_3$$

$$\text{s.t} \quad x_1 - x_2 - x_3 = 1$$
$$-x_1 + x_2 + 2x_3 \geq 1$$
$$\& \; x_1, x_2, x_3 \geq 0$$

Faculty Signature: (Ankush Kumar)

(ANKUSH KUMAR)

SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF MATHEMATICS

INTERNAL TEST (Academic Year: 2024)

Name of the Course : B.Sc (H) Maths
Name of the Paper : L.P.P and Applications
Duration : 1 hr
Date of Test : 06/05/2024

Semester: VI th - (Section-A)
Faculty Name: Ankush kumar
Maximum Marks: 10

Attempt any two questions : (Section-A)

Q1 Apply principal of duality to solve the following LPP:

$$\max Z = 2x_1 + 2x_2$$

s.t

$$2x_1 + 4x_2 \geq 1$$
$$x_1 + 2x_2 \geq 1$$
$$2x_1 + x_2 \geq 1$$
$$\& \; x_1, x_2 \geq 0$$

Q2 Solve the following assignment problem:

	I	II	III	IV	V
1	3	8	2	10	3
2	8	7	2	9	7
3	6	4	2	7	5
4	8	4	2	3	5
5	9	10	6	9	10

Q3 Solve the following transportation problem:

Origin \ Destination				Supply
1	6	8	4	14
2	4	9	3	12
3	1	2	6	5
Demand	6	10	15	

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(Section-B)

Q4 Use the graphical method to solve the dual of the following problem:

$$\text{Max } Z = x_1 + 2x_2 + 6x_3$$

s.t

$$3x_1 + x_2 + 2x_3 \leq 6$$

$$2x_1 + 3x_2 + x_3 \leq 6$$

& $x_1, x_2, x_3 \geq 0$

Q5 Solve the following problem by the big M method:

$$\text{Min } Z = 3x_1 + 2x_2 + 4x_3 + 8x_4$$

s.t $x_1 + 2x_2 + 5x_3 + 6x_4 \geq 8$

$$-2x_1 + 5x_2 + 3x_3 - 5x_4 \leq 3$$

& $x_1, x_2, x_3, x_4 \geq 0$

Q6 Use Simplex method to obtain the inverse of the following matrix:

$$A = \begin{bmatrix} 4 & 1 \\ 2 & 9 \end{bmatrix}$$

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DEPARTMENT OF MATHEMATICS

INTERNAL TEST (Academic Year 2024)

Name of the Course : B.Sc (H) Maths
Name of the Paper : LPP and applications
Duration : 1 hr
Date of Test : 06/05/2024

Semester: ..... VIth - (Section-B)
Faculty Name: Ankush kumar
Maximum Marks: 10

Attempt any two questions! (Section-A)

Q1 Use principle of duality to solve the following

L.P.P. $\max Z = 2x_1 + x_2$

s.t $x_1 + 2x_2 \le 10$

$x_1 + x_2 \le 6$

$x_1 - x_2 \le 2$

$x_1 - 2x_2 \le 1$

and $x_1, x_2, x_3 \ge 0$.

Q2 Solve the following transportation problem:

	D_1	D_2	D_3	D_4	Availability
S_1	2	3	11	7	6
S_2	1	0	6	1	1
S_3	5	8	15	9	10
Requirement	7	5	3	2	

Q3 Minimize the total man hours in the following assignment matrix by Hungarian method:

	I	II	III	IV	V
A	11	17	8	16	20
B	9	7	12	6	15
C	13	16	15	12	16
D	21	24	17	28	26
E	14	10	12	11	15

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Faculty Signature:

Q4 Solve the following LPP by Two Phase method!

$$\text{Max } Z = x_1 + 5x_2$$

s.t

$$3x_1 + 4x_2 \leq 6$$

$$x_1 + 3x_2 \geq 2$$

& $x_1, x_2 \geq 0$

Q5 Find the solution of given system of equations using simplex method!

$$3x_1 - 2x_2 = 8$$

$$x_1 + 2x_2 = 4$$

Q6 Determine all B.F.S of the system of equations!

$$2x_1 + x_2 + 4x_3 = 11$$

$$3x_1 + x_2 + 5x_3 = 14$$

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SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF MATHEMATICS

INTERNAL TEST (Academic Year.....)

Name of the Course : B.Sc(H) Maths
Name of the Paper : Linear Programming and Application
Duration :
Date of ~~Test~~ (Assignment): 29/04/2024

Semester: 6th
Faculty Name: Ankush kumar
Maximum Marks: 10

Attempt all the questions:-

Q1 Find all the B.F.S of the following equations:

$$x_1 + x_2 + 2x_3 = 9$$
$$3x_1 + 2x_2 + 5x_3 = 22$$

Q2 Solve the following problem by two-phase method:

$$\max Z = -x_1 - 2x_2$$
$$\text{s.t } 3x_1 + 4x_2 \leq 12$$
$$2x_1 - x_2 \geq 2$$
$$\& \; x_1, x_2 \geq 0$$

Q3 Solve the following linear program by the big-M method:

$$\min Z = 3x_1 - 3x_2 + x_3$$
$$\text{s.t } x_1 + 2x_2 - x_3 \geq 5$$
$$-3x_1 - x_2 + x_3 \leq 4$$
$$x_1, x_2, x_3 \geq 0$$

Q4 Use graphical method to solve the dual of the following problem:

$$\min Z = 2x_1 + x_2 + 3x_3 + 6x_4$$
$$\text{s.t } x_1 + x_2 + 3x_3 + 2x_4 \geq 3$$
$$2x_1 + x_2 + x_3 + 3x_4 \geq 2$$
$$\& \; x_1, x_2, x_3, x_4 \geq 0$$

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Faculty Signature:

List of Students not attending Class :-

Course : B.Sc (H) Maths
Semester : VI th
Section : A & B (Both)
Paper : Linear Programming & Its Applications.
Teacher : Mr. Ankush Kumar

List of Students as fallows -

S.No	Name	Roll No.
1.	Amit	17030
2.	Archit Chandra	17042
3.	Arnav Choudhary	17136
4.	Arnav Dev	17112
5.	Ashish Sangwan	17006
6.	Chinmay Singh	17175
7.	Deepanshu	17019
8.	Disha Sharma	17173
9.	Pardeep kumar meena	17165
10.	Raghav Anand Nath	17007
11.	Rohit	17116
12.	Shashank Dandriyal	17061
13.	Tarul	17103
14.	Yash Verma	17130
15.	Tamanna	17113

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SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF Mathematics

MENTOR-MENTEE MEETING

(Academic Year 2023-24)

Faculty Name : Anilesh Kumar **Date of Meeting:** 05/02/2024

Name of the Course : B.Sc (H) Maths (4th Sem) **Semesters** : ODD/EVEN ✓ IV th

List of Mentees:

S. No.	Roll No.	Course & Semester	Name of Student	Signature
1.	22/17030	B.Sc(H) Maths Sem-IV	Dipanshu Kumar	Dipanshu.
2	22/17042	B.Sc(H) Math	Kishan Kr. Jha	Kishan
3	22/17023	B.Sc(H) MAth	AYUSHMAN NAGAR	Ayushman Nagar
4	22/17025	B.Sc(H) Maths	Chirag Maheshwari	Chirag
5	22/17028	B.Sc(H) Math	Devendra Dhakad	देवेन्द्र
6.	22/17041	B.Sc. H Maths	Khushi Kumari	Khushi

Minutes of the Meeting:

The mentees told that the classes are going regularly.

Anilesh Kumar

Mentor Signature:

SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF Mathematics

MENTOR-MENTEE MEETING

(Academic Year 2023-24)

Faculty Name : Ankush kumar **Date of Meeting:** 04/03/24

Name of the Course : B.Sc(H) Maths **Semesters** : ODD/EVEN

List of Mentees: IV th

S. No.	Roll No.	Course & Semester	Name of Student	Signature
1.	22/17030	B.Sc(H) Maths IV	Dipanshu	Dipanshu
2.	22/17042	"	Kishan Kr. Jha	Kishanjha
3.	22/17028	"	Devendra Dhakad	देवेन्द्र
4.	22/17035	"	Harsh Pundir	harsh Pundir

Minutes of the Meeting:

There was no any issue.

Ankush kumar

Mentor Signature:

SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF Mathematics

MENTOR-MENTEE MEETING

(Academic Year 2023-24)

Faculty Name : Ankush kumar Date of Meeting: 22/04/24

Name of the Course : B.Sc (H) Maths (4th Sem) Semesters : ODD/EVEN IV th

List of Mentees:

S. No.	Roll No.	Course & Semester	Name of Student	Signature
1.	22/17030	B.Sc(H)Maths Sem(IV)	Dipanshu Kumar	Dipanshu.
2.	22/17042	"	Kishan Kr. Jha	Kishan
3.	22/17023	"	AYUSHMAN NAGAR	Anagar
4	22/17025	B.SC(H) Maths	Chirag Maheshwari	
5.	22/17028	B.SC(H) Math	Devendra Dhakad	देवेन्द्र
6.	22/17041	B.SCHMaths	Khushi Kumari	

Minutes of the Meeting:

Mentees reported that they don't have any problem related to college and study.

Ankush kumar

Mentor Signature:

SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF Mathematics

MENTOR-MENTEE MEETING

(Academic Year 2023-24)

Faculty Name : Ankush kumar **Date of Meeting:** 04/05/24

Name of the Course : B.Sc(H) Maths **Semesters** : ODD/EVEN ✓

IV th

List of Mentees:

S. No.	Roll No.	Course & Semester	Name of Student	Signature
1.	22/17030	B.Sc(H) Maths IV	Dipanshu	Dipanshu
2.	22/17042	"	Kishan Kr. Jha	Kishan
3.	22/17028	"	Devendra Dhakad	
4.	22/17035	"	Harsh Pandit	harsh Pandit

Minutes of the Meeting:

Mentees reported that their classes are going on smoothly. There was no issue.

Ankush kumar

Mentor Signature: