Started on	Wednesday, 17 February 2021, 2:00 PM
State	Finished
Completed on	Wednesday, 17 February 2021, 3:00 PM
Time taken	59 mins 46 secs
Grade	**33.50** out of 40.00 (**84**%)

Question **1**

Correct

Mark 1.00 out of 1.00

One constraint for a LPP is given as follows

x <= 0.2 (x + y)

What is the correct way to rearrange this as an equation (including a slack variable u) before entering it into a simplex table?

A. $-.8x + .2y + u = 0$

B. $-1.2x + .2y + u = 0$

C. $1.2x - .2y + u = 0$

D. $.8x - .2y + u = 0$

- C
- B
- A
- D ✔

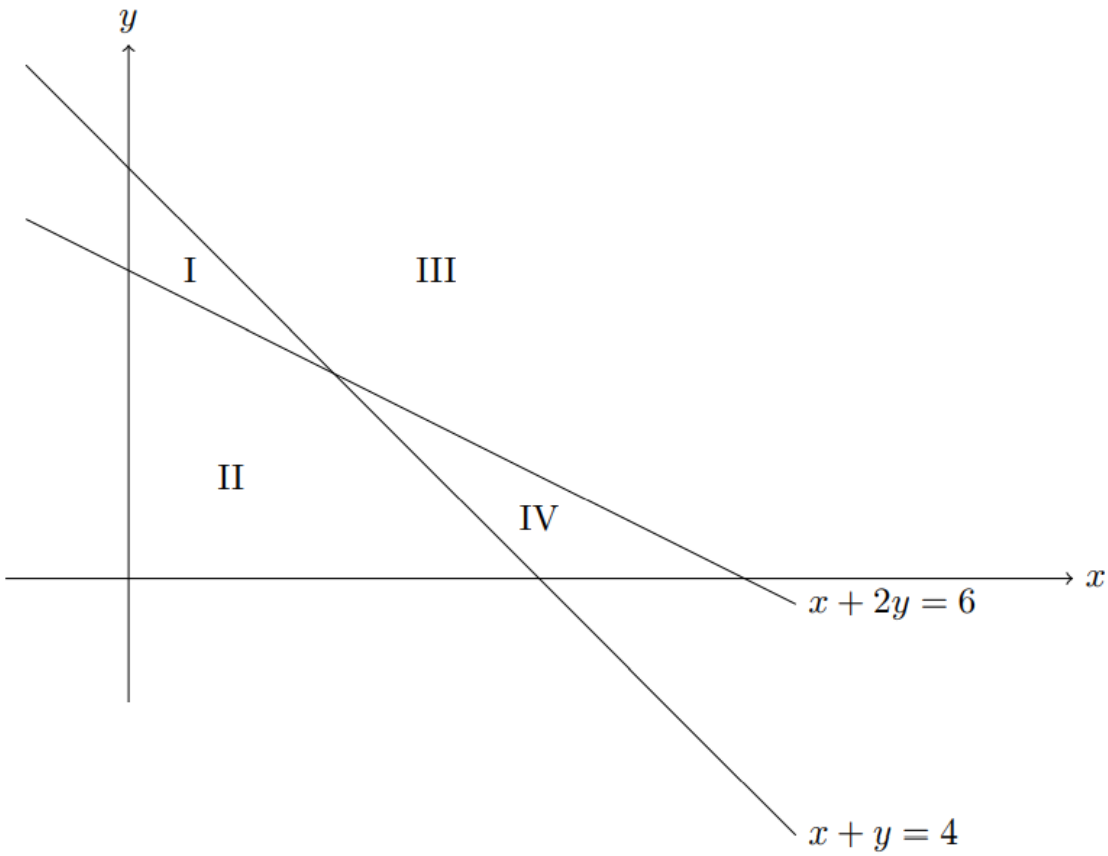
The correct answer is:
D

Question **2**

Correct

Mark 1.00 out of 1.00

Consider the feasible region given by the following inequalities, whose boundary lines are graphed below.



x + 2y ≥ 6, x + y ≥ 4, x ≥ 0, y ≥ 0

Which one of the following labels best indicate the feasible region described above?

- II
- I
- IV
- III ✔

The correct answer is:
III

Question **3**

Correct

Mark 1.00 out of 1.00

A company manufactures two products X and Y. Each product has to be processed in three departments: welding, assembly and painting. Each unit of X spends 2 hours in the welding department, 3 hours in assembly and 1 hour in painting. The corresponding times for a unit of Y are 3, 2 and 1 hours respectively. The maximum employee hours available in a month are 1,500 for the welding department, 1,500 in assembly and 550 in painting. The contribution to profits are £100 for product X and £120 for product Y.
What is the labour constraint for the welding department in this linear programme?

Select one:

- 2X + 3Y <= 550 hours
- 3X + 2Y <= 1,500 hours
- 2X + 3Y <= 1,500 hours ✔
- 3X + 2Y <= 550 hours

The correct answer is: 2X + 3Y <= 1,500 hours

Question **4**

Correct

Mark 1.00 out of 1.00

The RHS of a constraint represents

Select one:

- a. Resources needed in future
- b. available resources ✔
- c. Resources which are not needed
- d. Required resources

The correct answer is: available resources

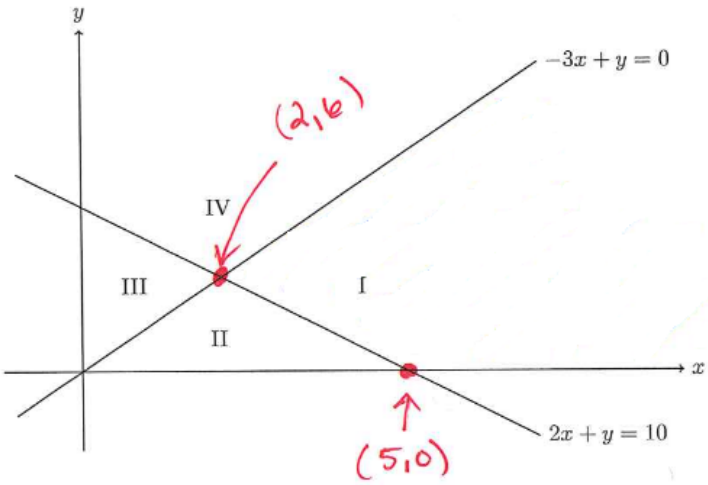
Question **5**

Correct

Mark 1.00 out of 1.00

Consider the following graphical representation of a LPP with constraints

-3x+y<=0, 2x+y>=10, x>=0,y>=0. Which one of the following label describes the feasible region?



- I ✔
- II
- IV
- III

The correct answer is:
I

Question **6**

Correct

Mark 1.00 out of 1.00

For a maximization problem, an entering variable in simplex table is

Select one:

- a variable with least value in Z-row
- a variable with most negative value in Z-row ✔
- a variable with value 0 in Z-row
- a variable with most positive value in Z-row

The correct answer is: a variable with most negative value in Z-row

Question **7**

Correct

Mark 1.00 out of 1.00

If a LPP has multiple solutions, which one of the following is true with respect to Graphical method?

- The slope of all the constraints is equal to zero
- The slope of the objective function is less than that of all of the constraints
- The slope of the objective function is greater than that of all of the constraints
- The slope of the objective function is same as that of one of the constraints ✔

The correct answer is:
The slope of the objective function is same as that of one of the constraints

Question **8**

Correct

Mark 1.00 out of 1.00

In Simplex method of maximization LPP problem, the criteria for leaving variable is

- based on maximum RHS value
- based on minimum ratio value ✔
- based on maximum ratio value
- based on minimum RHS value

The correct answer is:
based on minimum ratio value

Question **9**

Correct

Mark 1.00 out of 1.00

Which one of the following is false with respect to degeneracy in simplex method?

- A tie occurs while deciding leaving variable
- Degeneracy leads to alternative optimal solution ✔
- Degeneracy indicates that at least one constraint is redundant

The correct answer is:
Degeneracy leads to alternative optimal solution

Question **10**

Correct

Mark 1.00 out of 1.00

The solution of LPP in graphical method lies in

- Fourth quadrant
- Third quadrant
- Second quadrant
- First quadrant ✔

The correct answer is:
First quadrant

Question **11**

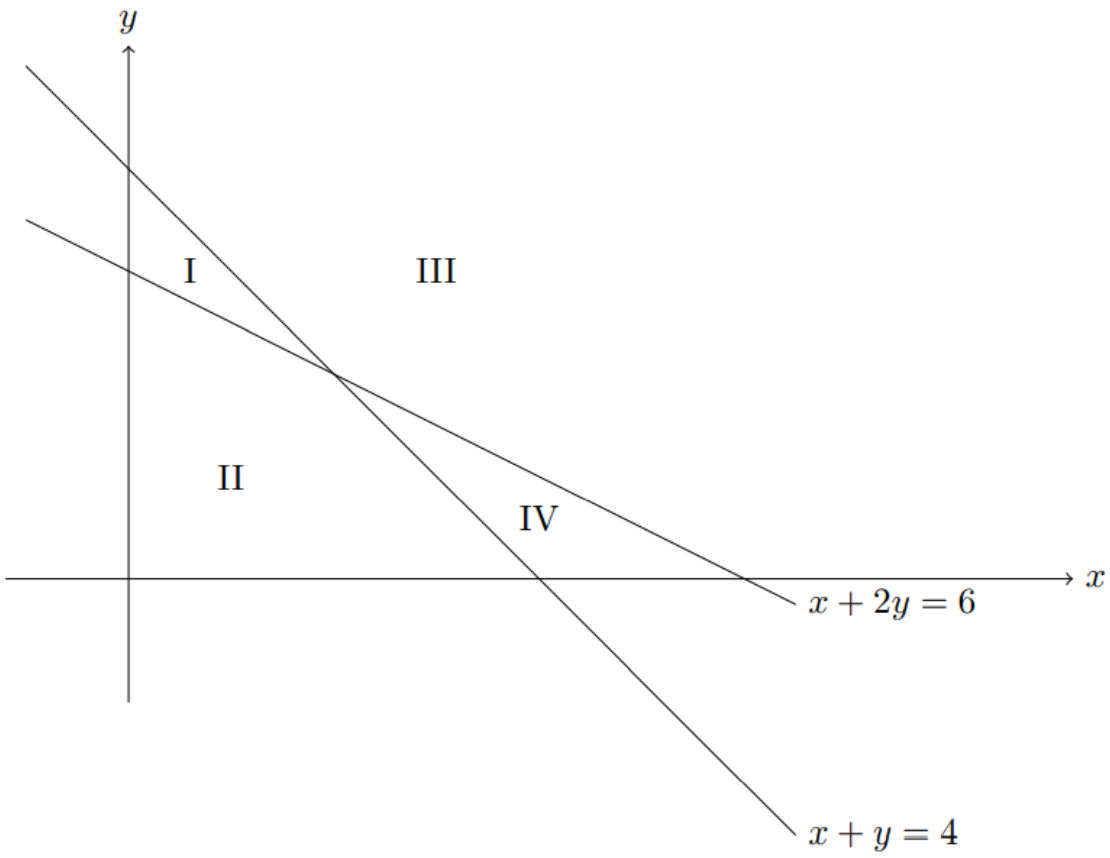
Incorrect

Mark 0.00 out of 1.00

Consider the following graphical representation of LPP

Maximize Z=x+3y.

What is the optimal point?



- (6,0)
- (0,4) ✖
- Unbounded solution
- (4,0)

The correct answer is:
Unbounded solution

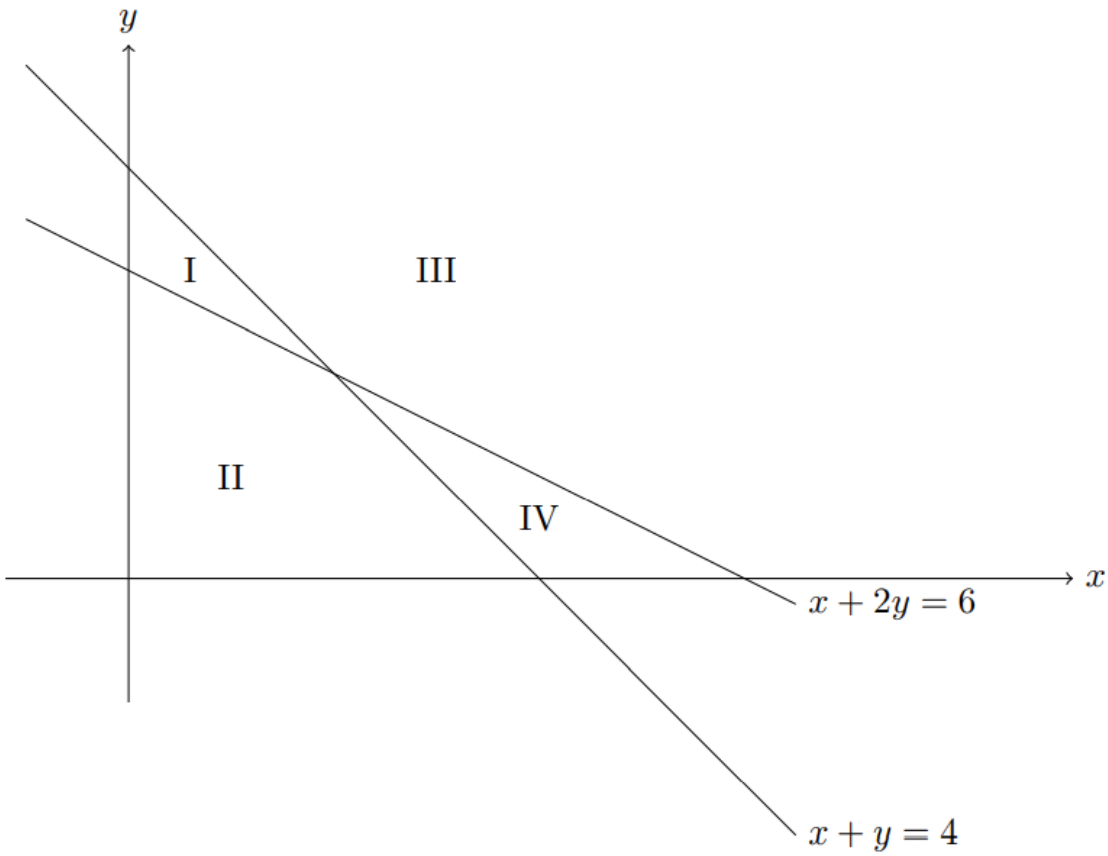
Question **12**

Incorrect

Mark 0.00 out of 1.00

Consider the following graphical representation of LPP with objective function

Minimize Z=x+3y. What is the optimal point?



- (2,2)
- (6,0)
- (0,4)
- (4,0) ✖

The correct answer is:
(6,0)

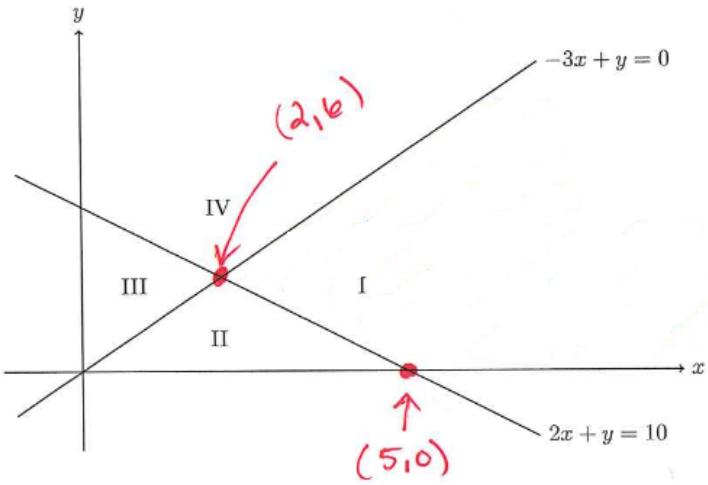
Question **13**

Incorrect

Mark 0.00 out of 1.00

Consider the following graphical representation of the LPP

Minimize Z= 3x+4y. What is the optimal point?



- (5,0)
- (0,0)
- No optimal point, Solution is unbounded.
- (2,6) ✖

The correct answer is:
(5,0)

Question **14**

Correct

Mark 1.00 out of 1.00

A linear programming problem has objective function P = 3x + 2y and the following linear inequality constraints. x − y ≤ 0, x + y ≤ 3, x ≥ 0, y ≥ 0 How many slack variables are needed for the simplex algorithm?

- 2 ✔
- 4
- 5
- 3

The correct answer is:
2

Question **15**

Correct

Mark 1.00 out of 1.00

Consider the following iteration table in simplex method

	x1	x2	x3	x4	x5	x6	RHS
Z row	-9	-18	-12	0	0	0	0
x4	4	2	5	1	0	0	80
x5	-2	-5	1	0	1	0	10
x6	7	3	-3	0	0	1	21

What is the pivot element?

- 5
- 3 ✔
- 7
- 2

The correct answer is:
3

Question **16**

Correct

Mark 1.00 out of 1.00

Consider the following iteration table in simplex method

	x1	x2	x3	x4	x5	x6	RHS
Z row	-9	-18	-12	0	0	0	0
x4	4	2	5	1	0	0	80
x5	-2	-5	1	0	1	0	10
x6	7	3	-3	0	0	1	21

Which variable enters the basis?

- x2 ✔
- x3
- x1
- x4

The correct answer is:
x2

Question **17**

Correct

Mark 1.00 out of 1.00

Alternative solutions exist of an LP model when

Select one:

- Objective function equation is perpendicular to a constraint that is satisfied as equation at the optimal solution
- Objective function equation is parallel to a constraint that is satisfied as equation at the optimal solution ✔
- One of the constraints is redundant
- Two constraints are parallel

The correct answer is: Objective function equation is parallel to a constraint that is satisfied as equation at the optimal solution

Question **18**

Correct

Mark 1.00 out of 1.00

In a Simplex table, the pivot element is the

Select one:

- Always intersection of first row and first column
- Intersection of zero coefficient column and minimum ratio row
- intersection of most negative coefficient column and maximum ratio row
- intersection of most negative coefficient column and minimum ratio row ✔

The correct answer is: intersection of most negative coefficient column and minimum ratio row

Question **19**

Correct

Mark 1.00 out of 1.00

Consider the LPP

Max z = 3 X1 + 9 X2

S.T

X1 + 4 X2 <= 8

X1 + 2 X2 <= 4

X1 , X2 >=0

Which one of the above is a redundant constraint?

Select one:

- X1 + 4 X2 <= 8 ✔
- X1 + 2 X2 <= 4
- 3 X1 + 9 X2
- X1 , X2 >=0

The correct answer is: X1 + 4 X2 <= 8

Question **20**

Correct

Mark 1.00 out of 1.00

A company manufactures two products X and Y. Each product has to be processed in three departments: welding, assembly and painting. Each unit of X spends 2 hours in the welding department, 3 hours in assembly and 1 hour in painting. The corresponding times for a unit of Y are 3, 2 and 1 hours respectively. The maximum employee hours available in a month are 1,500 for the welding department, 1,500 in assembly and 550 in painting. The contribution to profits are £100 for product X and £120 for product Y.

What is the objective function (Z) to be maximised in this linear programming problem (where Z is total profit in £s)?

Select one:

- Z = 100X + 120Y ✔
- Z = 1500X + 1500Y
- Z = 120X + 100Y
- Z = 2X + 3Y

The correct answer is: Z = 100X + 120Y

Question **21**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

Maximize Z = 5x + 3y

subjected to

2x + y ≤ 1

x + 4y ≥ 6

x, y ≥ 0

Considering the solution by two phase method

Write the objective function and initial table of Phase I only (Don't solve or no need to do any computation)

objective function Min a = A1

Max a = -A1

a + A1 = 0

	x	y	x1	x2	A1	br
a row	0	0	0	0	1	0
x1	2	1	1	0	0	1
A2	1	4	0	-1	1	0

Question **22**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

minimize 6x1 + 3x2

subject to

x1 + x2 >= 1

2x1 − x2 >= 1

3x2 <= 2

x1, x2 >= 0

Considering the solution by two phase method

Write the objective function and initial table of Phase I only (Don't solve or no need to do any computation)

a+A1+A2=0

max a = -A1-A2

	x1	x2	x3	x4	A1	A2	br
a row	0	0	0	0	1	1	0
A1	1	1	-1	0	1	0	1
A2	2	-1	0	-1	0	1	1

Question **23**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

Max Z = 2x1 + x2

Subject to 3 x1 + 4 x2 ≤ 8

6 x1 + x2 ≤ 3

and x1, x2 ≥ 0

Using Revised Simplex method

write the computation Zj-Cj alone for the starting iteration.

(For example write your answer as

Zj-Cj=(-2, -1)

)

Zj-Cj=(-2, -1)

Question **24**

Complete

Mark 0.50 out of 2.00

An assembly line consisting of three consecutive stations produces two radio models: HiFi-1 and HiFi-2. The following table provides the assembly times for the three workstations.

	Minutes per unit	
Workstation	*HiFi-1*	*HiFi-2*
1	6	4
2	5	5
3	4	6

The daily maintenance for stations 1,2, and 3 consumes 10%,14%, and 12%, respectively, of the maximum 480 minutes available for each station each day.

Write the constraints only in the given editor.

x1 -> no of HIFI 1

x2 -> no of HIFI 2

s.t

6x1 + 4x2 <= 480

5x1 + 5x2 <= 480

4x1 + 6x2 <= 480

Question **25**

Complete

Mark 0.50 out of 2.00

Top Toys is planning a new radio and TV advertising campaign. A radio commercial costs $300 and a TV ad cosls $2000. A total budget of $20,000 is allocated to the campaign. However, to ensure that each medium will have at least one radio commercial and one TV ad, the most that can be allocated to either medium cannot exceed 80% of the total budget. It is estimated that the first radio commercial will reach 5000 people, with each additional commercial reaching only 2000 new ones. For TV, the first ad will reach 4500 people and each additional ad an additional 3000.

Write the constraints only in the given editor.

300x+2000y<=20000

300x<=1600

2000y<=1600

x>=0

y>=0

Question **26**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

MAX Z = 2x1 + x2
subject to
3x1 + 4x2 <= 6
6x1 + x2 <= 3
and x1,x2 >= 0

Using Revised Simplex method

write the computation Zj-Cj alone for the starting iteration.

(For example write your answer as

Zj-Cj=(-2, -1)

)

Zj-Cj=(-2, -1)

Question **27**

Complete

Mark 1.50 out of 2.00

Convert the following LPP into Standard form.

(Type the standard form only. No need to solve it)

min 2x1 − x2 + x3

subject to

x1 − x2 + x3 ≥ −1 (Note that RHS should not be negative. Convert suitably)

x1 − x2 − x3 ≥ 2

x1 + x2 + x3 = 3

x1, x2,x3 ≥ 0

Z+2x1-x2+x3+0x4+0x5 =0

-x1+x2-x3-x4 +A1= 1

x1-x2-x3-x5+A2 = 2

x1+x2+x3+A3 = 3

x1,x2,x3,x4,x5,A1,A2,A3 >= 0

Question **28**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

Max Z = 2x1 + x2

Subject to 3 x1 + 4 x2 ≤ 12

6 x1 + x2 ≤ 16

and x1, x2 ≥ 0

Using Revised Simplex method

write the computation Zj-Cj alone for the starting iteration.

(For example write your answer as

Zj-Cj=(-2, -1)

)

Zj-Cj=(-2, -1)

Question **29**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

max z = 2x1 + 3x2 + x3

s.t. x1 + x2 + x3 ≤ 40

2x1 + x2 − x3 ≥ 10

−x2 + x3 ≥ 10

x1, x2, x3 ≥ 0

Considering the solution by two phase method

Write the objective function and initial table of Phase I only (Don't solve or no need to do any computation)

Max Z =-A1-A2

a+A1+A2 = 0

	x1	x2	x3	x4	A1	A2	br
a row	0	0	0	0	1	1	0
A1	1	1	-1	0	1	0	10
A2	2	-1	0	-1	0	1	10

Question **30**

Complete

Mark 2.00 out of 2.00

Consider the following LPP

Max Z = 2x1 + x2

Subject to 3 x1 + 4 x2 ≤ 8

6 x1 + x2 ≤ 12

and x1, x2 ≥ 0

Using Revised Simplex method

write the computation Zj-Cj alone for the starting iteration.

(For example write your answer as

Zj-Cj=(-2, -1)

)

Zj-Cj=(-2, -1)

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