

**EXAMINATION SCRIPT**

STUDENT NO.

1 7 0 5 0 9 5



DEPARTMENT:

CSE

L-2 T-2

BANGLADESH UNIVERSITY OF  
ENGINEERING AND TECHNOLOGY

COURSE NO.

DATE

COURSE TITLE

**SECTION A****Declaration on the Online Course Conduct by Undergraduate Student of BUET for  
COVID-19 Situation**

Please write the declaration (as per no. 2 of Instructions) given in the footer below in your own handwriting and sign it.

On my honour, I bearing Student No..... 1705095 ..... hereby declare that,

I shall not misuse, in any form or method, the course materials, Audio and Video Records of the lectures of this course. I shall not adopt any unfair means during the Final examination and shall not receive any help or offer/provide help to anyone. I shall preserve hard copy and soft copies of the answer scripts and will not expose the same to any person/party/media. I agree to accept any punitive measure taken by BUET authority if at any time during or after the completion of the course it is revealed/ violated otherwise.

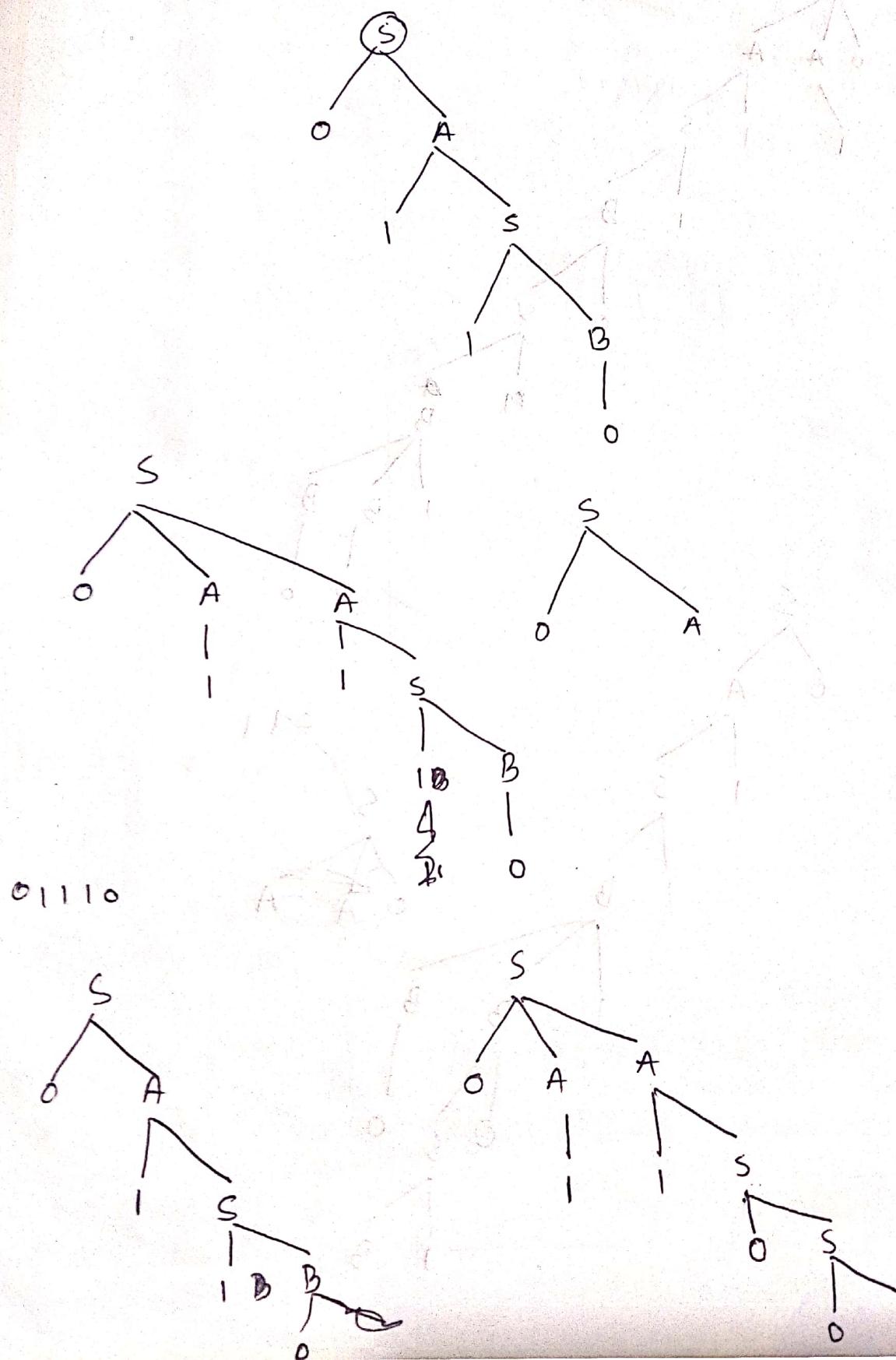
Signature..... Iftekhar Hakim Kaosar

Date.....

**Instructions**

1. Clearly enter your Student ID, Course Number, Course Title, and Date in the space provided. Complete the declaration exactly as below with your signature and date. You can also insert the scanned image of your handwritten declaration in this box.
2. Declaration: I shall not misuse, in any form or method, the course materials including Lecture Notes, Reading Materials, Audio and Video Records of the lectures of this course. I shall not adopt any unfair means during the Final Examination and shall not receive any help or offer/provide help to anyone. I shall preserve hard copy and soft copies of the answer scripts and will not expose the same to any person/party/media. I agree to accept any punitive measure taken by BUET Authority if at any time during or after the completion of the course it is revealed/ violated otherwise.
3. Do not put your name or any other form of identification except the Student No. anywhere in the answer script.
4. Use offset/normal white paper of A4 size for writing the answer. Use only one side of the paper for writing. On each page, clearly write your Student ID and Page numbers.

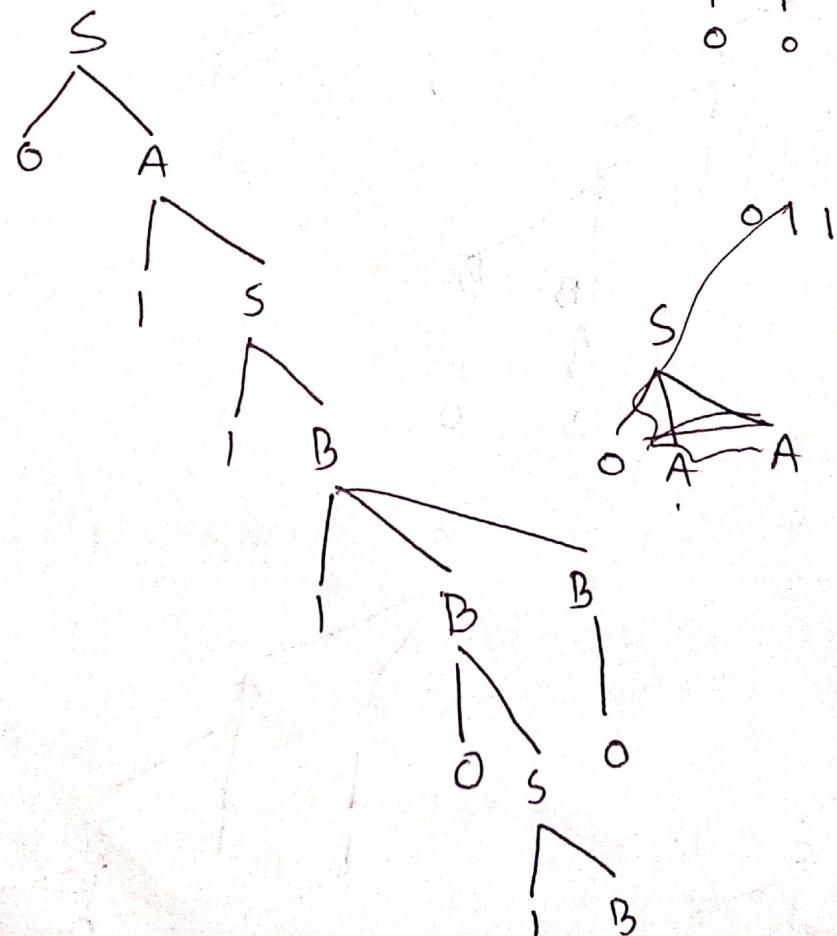
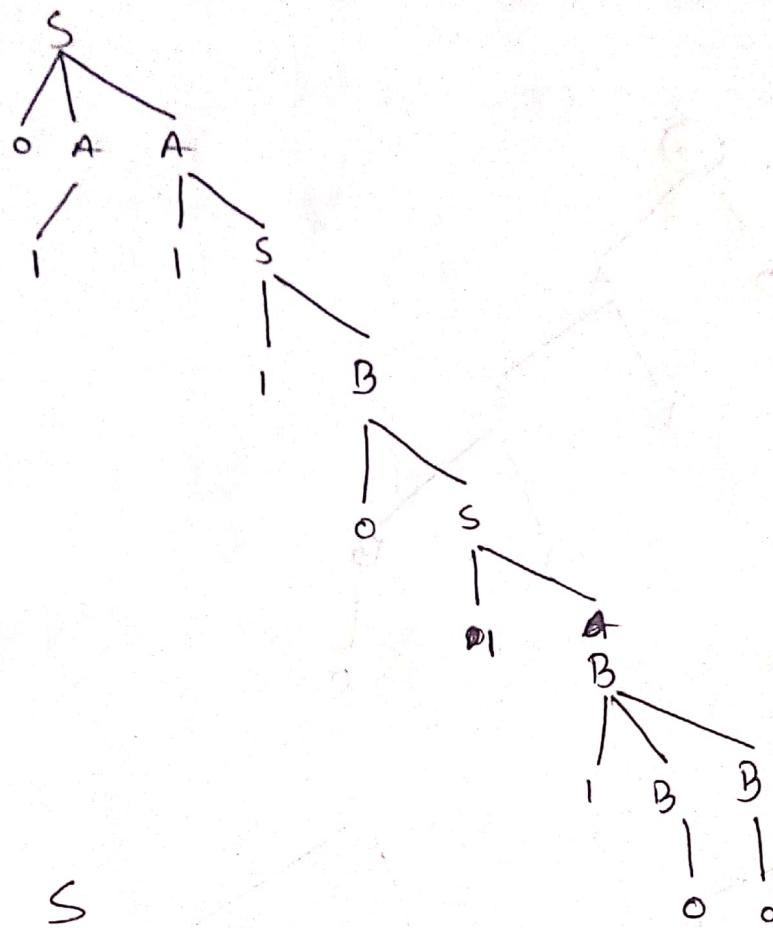
$$E \Rightarrow E+E \Rightarrow E * E + E \xrightarrow{*} a+a*a$$



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A-2

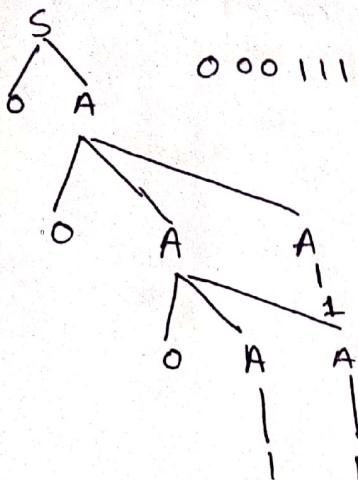
01110 1100



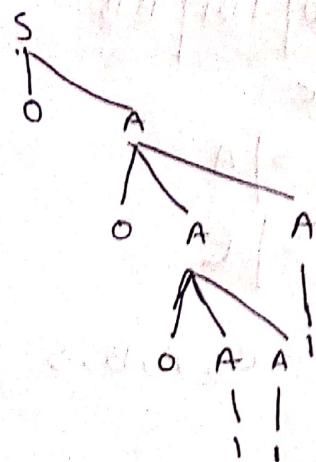
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n=3

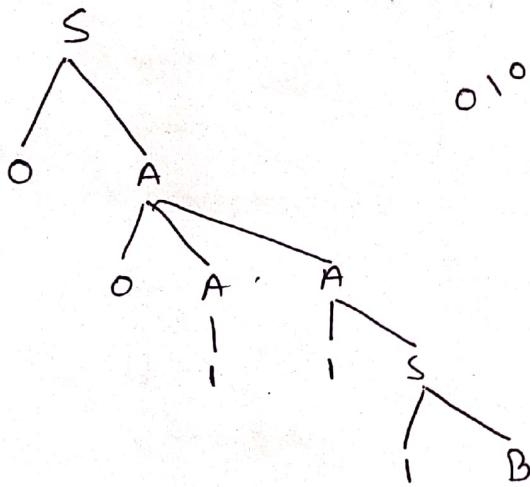
0110110



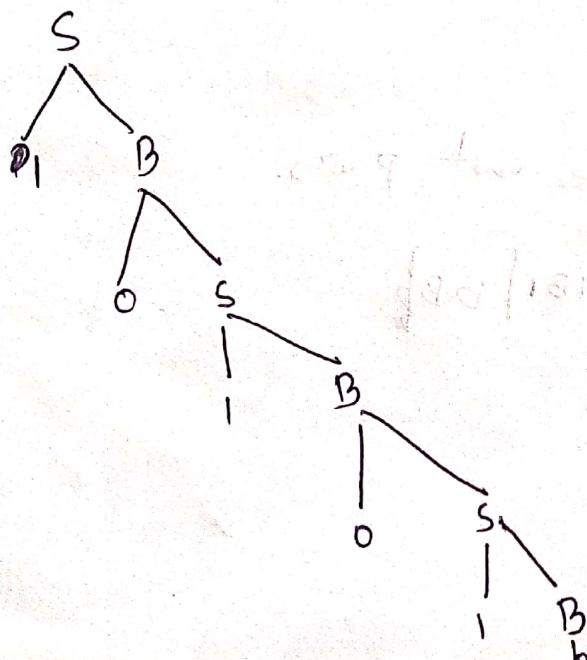
000111



010101



1010100



$$S \rightarrow 0 A 0 \mid 1 B 1 \mid B B$$

$$A \rightarrow c$$

$$B \rightarrow S \mid A$$

$$C \rightarrow S \mid E$$

①

Nullables : C, A, B, S

So,

$$S \rightarrow 00 \mid 0 A 0 \mid 11 \mid 1 B 1 \mid B \mid B B \mid c$$

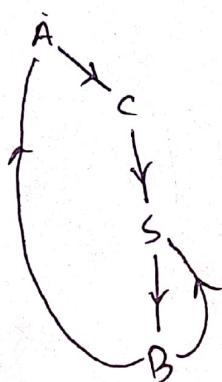
$$A \rightarrow c$$

$$B \rightarrow S \mid A$$

$$C \rightarrow S$$

②

Unit productions,



So, all pairs are unit pairs.

$$S \rightarrow 00 \mid 0 A 0 \mid 11 \mid 1 B 1 \mid B B \mid c$$

$$A \rightarrow \text{same}$$

$$B \rightarrow \text{same}$$

$$C \rightarrow \text{same}$$

③  $\leftarrow$  C

C not generating, unreachable.

C useless.

So, Assuming,

$$\begin{array}{l} \textcircled{1} \rightarrow \\ z \rightarrow 0 \\ x \rightarrow 1 \end{array}$$

$$S \rightarrow z^2 | zAz | xx | xBx | \cancel{BB}$$

A  $\rightarrow$  same

B  $\rightarrow$  same

C  $\rightarrow$  same

Assuming,

$$\textcircled{1} \quad u \rightarrow Az$$

$$v \rightarrow Bx$$

$$\begin{aligned} S &\rightarrow z^2 | zAz | x \\ &\rightarrow z^2 | zu | xx | xv | BB \end{aligned}$$

A, B, C  $\rightarrow$  same

$$u \rightarrow Az$$

$$v \rightarrow Bx$$

$$z \rightarrow 0$$

$$x \rightarrow 1$$

$$S \rightarrow E$$

$$a \rightarrow 0|1$$

$$b \rightarrow aa$$

$$c \rightarrow bb$$

$$w \rightarrow \underline{c} | wc$$

$$w \rightarrow \underline{a} aa aa | w.$$

$$S \rightarrow TOT$$

$$T \rightarrow 1X | 0X | \epsilon \text{ (Even)}$$

$$X \rightarrow 1T | OT$$

$$a \rightarrow 1$$

$$b \rightarrow 0$$

$$c \rightarrow ab | ba$$

d.

$$x \rightarrow 0|1$$

$$A \rightarrow 00|11$$

$$B \rightarrow$$

$$S \rightarrow \epsilon | 00500 | 01510 | 01501 | 10501 | 11511$$

④

$$A \rightarrow BAB | ABA | B | \epsilon$$

$$B \rightarrow 00 | \epsilon$$

Nullables : A, B.

So,

$$A \rightarrow BAB | B | A | AB | BB | BA | ABA | AA \}$$

$$B \rightarrow 00$$

$$A \rightarrow \epsilon$$

Unit rule,

(A, B) are unit pair.

$$A \rightarrow BAB | AB | BB | BA | ABA | AA | 00$$

$$B \rightarrow 00$$

$$A \rightarrow \epsilon$$

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A-7

3 2 1

$$2^3 \times 3^2 \times 5$$

$$\cancel{2 \times 2}$$

$$3^1 \overset{5}{\underset{2}{\times}} 2$$

$$2^1 \overset{2}{\underset{2}{\times}} 2$$

$$2 \overset{5}{\underset{3 \times 5}{\times}}$$

2

$$2 \overset{3}{\underset{\times 2}{\times}}$$

$$5 \times 3$$

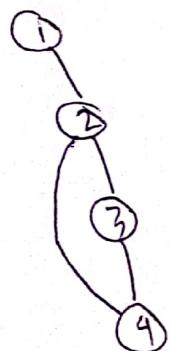
\*2



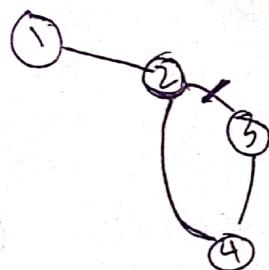
$$2+1$$



$$3 + 2 + 1 = 6$$

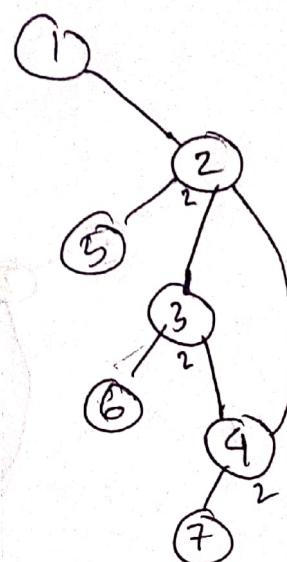


$$3 + 2 = 5$$



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A-B

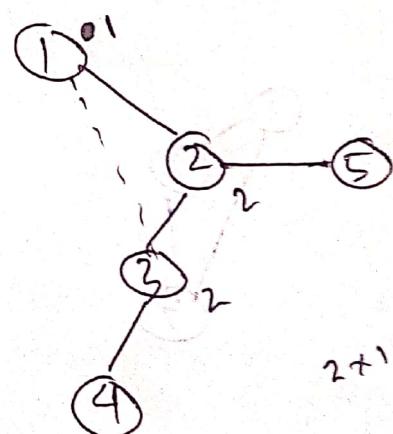
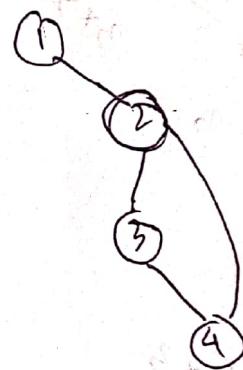


6

3

6

$$1+2+7$$

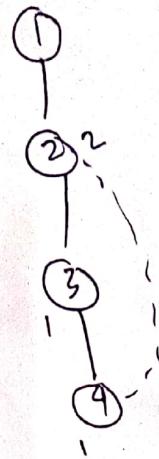


$$2+1+2+3 = 8$$

$$4+3+2+1=9$$

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1705095-A-9

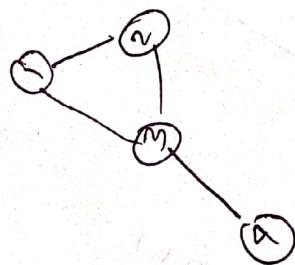


6

$0+2+3$

6

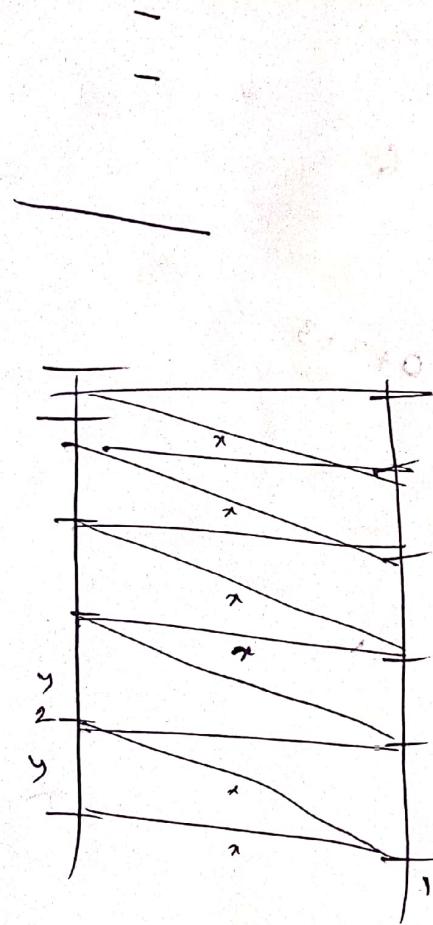
3



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A-10

1 2  
3 9



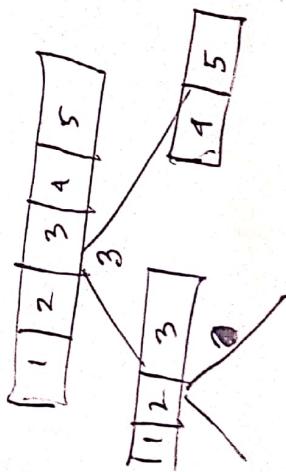
$\star$   
 $1+2 \leftarrow 5$

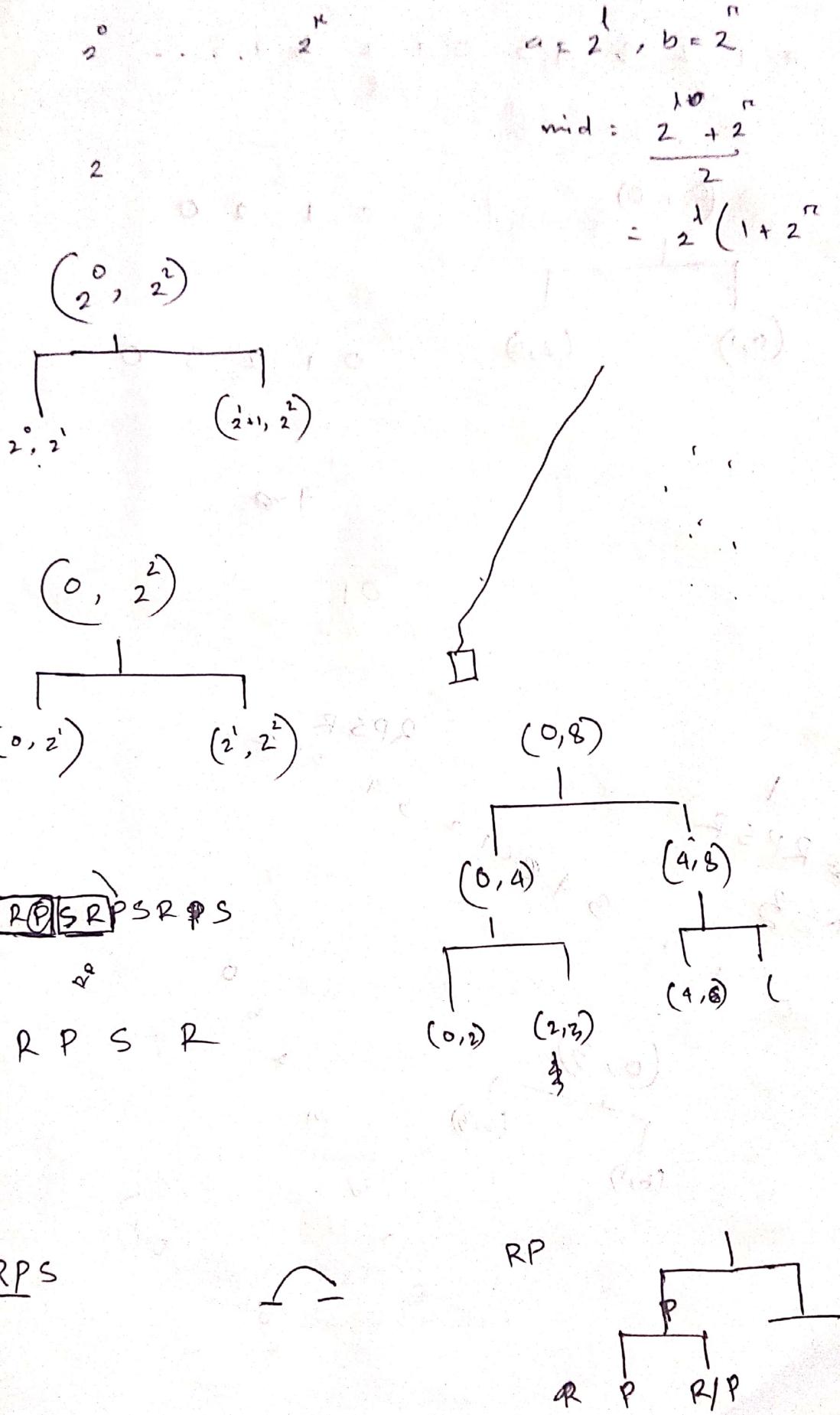
$$\frac{n(n+1)}{2} \leq$$

$$\frac{\alpha(nx)}{2} \leq n+1$$

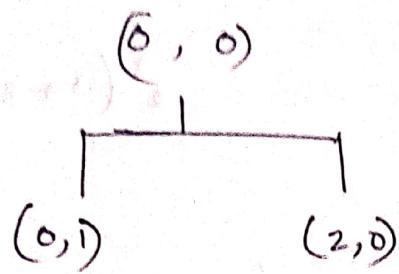
$$\Rightarrow \alpha(nx) \leq 2(n+1)$$

∴





0 1 2 3 4 5 0 1 2 3 4 5



0 1 2 0

0 1 2 3 0

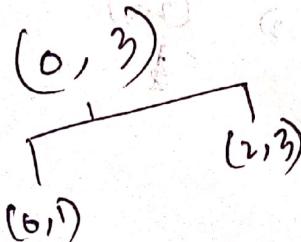
4 -

0 1

R P S R  
0, 1 2, 0

$S = R P S P$   
 $\star = 3$

0



0

1

2

1

0

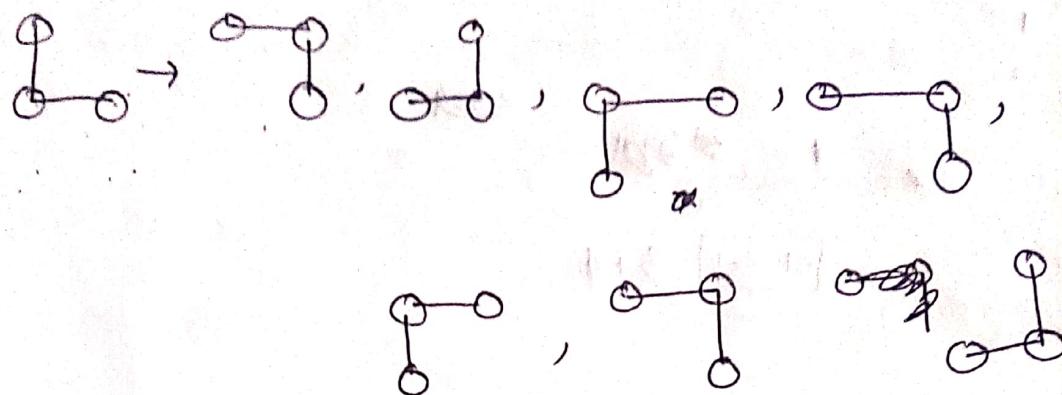
0'

1

0'

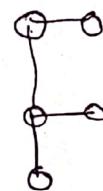
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A.13

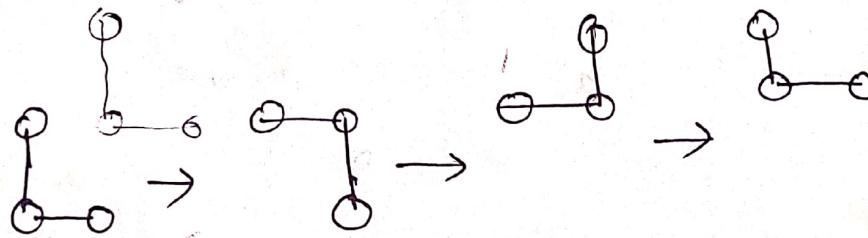


(+1,+1) (+1,0)

(+1; 0)



(0,1), (2,2) →



ଦେଖନ୍ତି  $(+1,+1) \rightarrow 4$

ବ୍ୟାକ

\*

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1

2

$$\boxed{-1 \quad -1} \quad 3 + 4$$

$$\begin{array}{r} -1 \\ + 2 + 3 \\ \hline 2 + 3 \end{array}$$

$$-1 - 1 + 3 + 4 = 5$$

$$\begin{array}{r} -1 + 2 - 18 + 9 \\ \hline \end{array}$$

$$-1 - 1 + 3 + 4$$

1 + 2 + 3

$$1+2+3+4$$

2 3 4 5

1, 3, 6, 10

5 220392

$$e^{-\alpha t} = x$$

卷之三

$$n = 205$$

3 1

2

✓

22

$$x = 2$$

$n = 3$  1 2 2 3

