

# MARWADI UNIVERSITY

## Answer Book

Enrolment No.

92200103184

530273

Student's Signature

92200103184

t119417x94883



Supervisor's Signature

Supervisor's Name

CJV

Seat No.

MU

Main	Suppli.	Total
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1 + 0 = 1

Subject Name	AI
Subject Code	01CE1702
Date of Exam	16 09 2025

### PART - I (To be filled by examiner only)

PROGRAM / DEPT. NAME

B.Tech - CE

Question No.	Marks by Examiner	Marks by Verifier-I	Marks by Verifier-II	For the use of University
1				
2				
3				
4				
5				
6				
7				
Total Marks Obtained				SIGNATURE OF SUPERVISOR (Incase of student registered under unfair means)
Total Marks Rounded				SIGNATURE OF SENIOR SUPERVISOR (Incase of student registered under unfair means)
Total Marks in Words				

BARCODE/QR FOR EXAMINER

Examiner Institute	Examiner's Full Name	Signature & Date
Verifier Institute	Verifier's Full Name	Signature & Date
01)		
02)		



**Marwadi**  
University  
Marwadi Chandarana Group

**MARWADI UNIVERSITY**

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## Instructions to Candidates

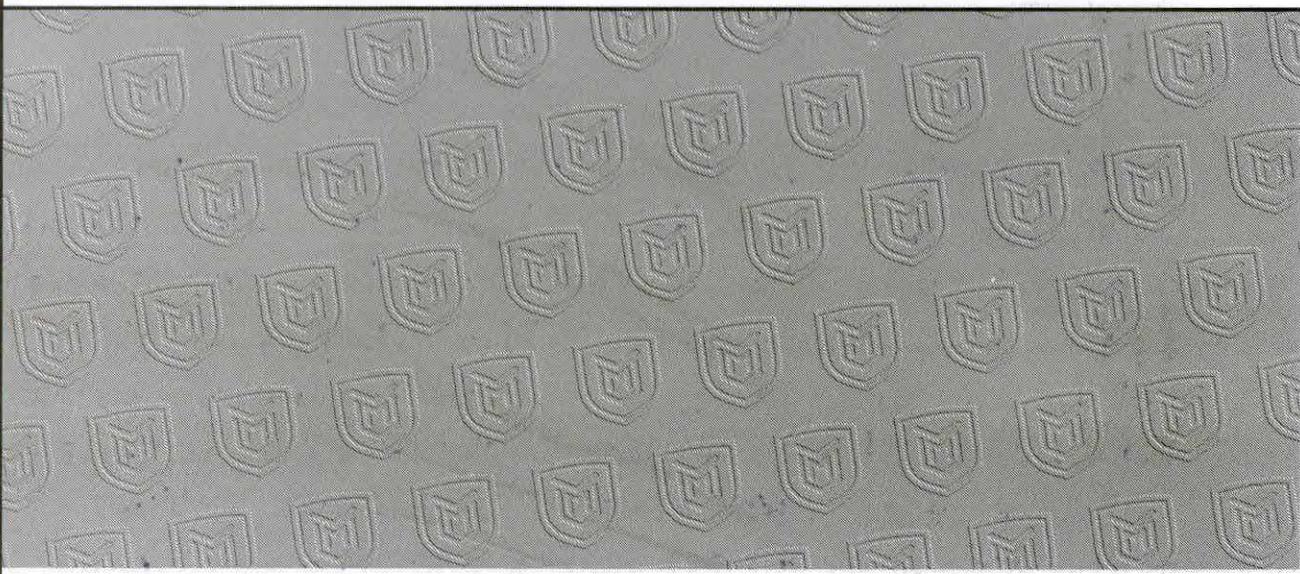
- A candidate should ensure that any objectional material leading to UFM case is not lying around his/her seat prior to the commencement of the examination and it will be the sole responsibility of the candidate to inform to the supervisor.
- A candidate should verify the answer book/supplementary pages are printed properly and does not have any damages. If find any missing page/defect, must get it replaced before writing anything by requesting to the supervisor. No pages of the answer book/supplementary should be removed/damaged by the candidate.
- Enter your enrolment number, subject code, date of exam, program name at appropriate space provided.
- A candidate needs to paste barcode/QR sticker (verify own enrolment number) at the appropriate space on the front page.
- Do not write your name or number or any sign in the answer book which reveals your identity.
- Do not write anything on main page space provided for examiner/university usage.
- Write relevant answer of the question in a clear and legible handwriting on the both sides of the answer book.
- Begin a new question answer on separate page. **WRITE YOUR ANSWERS IN BLUE OR BLACK BALLPOINT PENS ONLY.**
- Candidates are not allowed to write/marks anything on the question paper (except enrol. number at the space provided). Any page of the answer book used for rough work should be marked as 'rough work'.
- No candidate will be allowed to leave the examination hall after the commencement of examination till 45 minutes and during the last 10 minutes of the examination session.
- Do not leave your seat in any circumstances without the prior permission of the block supervisor.
- If any objectional material related to the examination or mobile phone or programmable calculator or electronic/ non electronic device or handwritten/printed paper chit/cloth/body parts or any other material is found with the candidate or found exchanging any of them or found exchanging answer book/question paper; the candidate will be immediately expelled, and the final punishment will be imposed as per university rules and regulations.
- The candidate must use their own pens, pencils, ruler, eraser, and other stationary items. They are strictly prohibited from communicating/ pointing/exchanging any stationary items with anyone other than the invigilator, both inside and outside the examination hall. Engaging in any other form of communication will be considered a violation of the examination rules. Candidate who is found either copying or receiving assistance and Candidate offering assistance to other candidates will be punished as per rules of university.
- There will be warning bell/announcement by supervisor 10 minutes before the completion of the examination.
- Before 10 minutes of completion of the examination, the candidate will stop writing, tie up the supplementary, make total of answer book & supplementary on main page, paste brown/black hollow stickers main page of supplementary/ answer book space provided to cover identity information filled by the candidate.
- The candidate must surrender the answer book along with tied supplementary (used/ unused) to the supervisor after the final bell/immediately upon completion of examination time before leaving the examination hall. If failed to do the action will be taken against the candidate as per university rules and regulations.
- The candidate may also not be allowed to take the question paper out of the examination Hall until he/she completed the examination and the answer books have been submitted.
- Any damage/tear/swallow/take away of the answer book/supplementary is an offence able conduct and disciplinary action will be taken for the same.
- A disciplinary action will be taken against the candidate who disobeys the instructions of the supervisor or misbehave or violates the code of conduct of the Marwadi University examinations.

## પરીક્ષાર્થીઓ માટે સુચના

- પરીક્ષાની શરૂઆત પહેલા ઉમેદવારે પાતરી કરવી જોઈએ કે UFM/ગેરરીતિ કેસ તરફ દોરી જીવી કોઈપણ વાંધાજનક સમગ્રી તેની બેઠકની આસપાસ પેલી નથી અને જો હોય તો તે સુપરવાઈઝરને જ્ઞાન કરવાની સંપૂર્ણ જરૂરાદી ઉમેદવારની રહેણી.
- ઉમેદવારે ખરાઈ કરવી જોઈએ કે ઉત્તરવહી /પૂર્ક પૂર્ણ યોગ્ય રીતે છૃપાયેલા છે અને તેમાં કોઈ નુકસાન નથી. જો કોઈ ગુમ થયેલ પૂર્ક/ભારી જ્ઞાન, તો સુપરવાઈઝરને વિનંતી કરીને કંઈપણ લખતા પહેલા તેને બદલતું આવશક છે. ઉમેદવાર દ્વારા ઉત્તરવહી/પૂર્ક પૂર્ણ કોઈપણ પાના દ્રોષીતપ્રસ્ત થવા જોઈએ નથી.
- આપેલ યોગ્ય જગ્યા પર તમારો નોંધવી નંબર, વિષય કોડ, પરીક્ષાની તારીખ અને પરીક્ષાની વિગતો લાખો.
- ઉમેદવારે અગ્નાન પેંચ પર યોગ્ય જગ્યા પર બારકોડ/QR સ્કૈનર (પોતાના રોલ નંબરની ચકાસવી કરીની) લગાવવાનું રહેણે.
- ઉત્તરવહીના તમારું નામ અથવા નંબર અથવા કોઈપણ ચિહ્નન લખણો નથી તો તમારી ઓળખ છતી કરે.
- પરીક્ષા/યુનિવર્સિટી ઉપયોગ માટે આપવામાં આવેલ ઉત્તરવહીના મુખ્ય પૂર્ણની જગ્યા પર કંઈપણ લખણો નથી.
- ઉત્તરવહીના બંને બાજુઓ સ્પષ્ટ અને સુવાચ્ય હસ્તાક્ષરાં પ્રશ્નનો સંબંધિત જગ્યાની લાખાં લાખો.
- અલગ પેંચ પર નાનો પ્રશ્ન/જગ્યા શરૂ કરો. તમારા જવાબો ફક્ત વાદળી અથવા કાણી બોલ પોઈન્ પેનમાં લાખો.
- ઉમેદવારોને પ્રશ્નપત્ર પર કંઈપણ લખણ/ચિહ્નન કરવાની મંજૂરી નથી (આપવામાં આવેલ જગ્યા પર રોલ નંબર સિવાય). રફ્ક કાર્ડ માટે ઇન્પોયેગમાં લેવાતો ઉત્તરવહીના કોઈપણ પેંચને 'રફ્ક કાર્ડ' તરફે ચિહ્નિત કરવું જોઈએ.
- પરીક્ષા પ્રથમ થાથી પછી જપ મિનિટ સુધી અને છેલ્લી ૧૦ મિનિટ દરવિધાન કોઈપણ ઉમેદવારને પરીક્ષા હોલ્ડમાંથી ભાદર જવા દેવામાં આવશે નથી.
- બ્લોક સુપરવાઈઝરની પૂર્વ-પરવાનગી વગર કોઈપણ સંઝેગોમાં તમારી બેઠક છોડો નથી.
- જો પરીક્ષાને લગતી કોઈપણ વાંધાજનક સમગ્રી અથવા મોબાઇલ ફોન અથવા ગ્રોમેન્બલ કેલ્ક્યુલેટર અથવા ઇલેક્ટ્રોનિક/નોન ઇલેક્ટ્રોનિક ઉપકરણ અથવા હસ્તલિખિત/પ્રિન્ટેડ કાળજી/કાપડ/શરીરના ભાગો અથવા અન્ય સમગ્રી ઉમેદવાર પાસે મળી આવે અથવા તેમણે કોઈની આપ-વે કરતા જોવા મળે અથવા ઉત્તરવહી પ્રશ્નપત્રના આપ-વે કરતાં જોવા મળે; તો ઉમેદવારને પરીક્ષામાંથી ઉડાળ મૂકવામાં આવશે અને યુનિવર્સિટીના નિયમો અનુસાર કાર્યવાતી આવશે.
- ઉમેદવારે પોતાના જ પેન, પેનસ્લિલ, ફૂટપ્લાન્ટ, રબર અને અન્ય વસ્તુઓનો ઉપયોગ કરવો. તેઓને પરીક્ષા પંડીના અંદર અને ભાદર બંને નિરીક્ષણ સિવાય અન્ય કોઈની સાથે વાતચીત/ઈચારા કરવા/કોઈપણ વસ્તુઓનો આપ-વે કરવા પર સાખત પ્રતિષ્ણા છે. અન્ય કોઈપણ મકારની વાતચીતમાં સામેલ થતું એ પરીક્ષાના નિયમોનું ઉલ્લંઘન ગણવામાં આવશે. જે ઉમેદવાર નહિ કરતો/સહાય મેળવતો જોવા મળે અથવા અન્ય ઉમેદવારોને સહાય આપતો હોય તેને યુનિવર્સિટીના નિયમો મુજબ શિક્ષણ કરવામાં આવશે.
- પરીક્ષા પૂર્વ થયાની ૧૦ મિનિટ પહેલા ચેતવણીની ઘંટી/સુપરવાઈઝર દ્વારા ઘોષણા થશે.
- પરીક્ષા પૂર્વ થયાની ૧૦ મિનિટ પહેલાં, ઉમેદવાર લખવાનું બધું કરશે, પૂર્ક પૂર્ણ બાંધી પર ઉત્તરવહી અને પૂર્ક પૂર્ણનો લિસ્ટ લખશે. ઉમેદવાર દ્વારા ભેદેલી ઓળખ માહિતી છુપાવાનો માટે આપેલ બ્રાઉન/લ્યેન્ડ લોલો સ્ટાફર્સ પૂર્ક/ઉત્તરવહી મુખ્ય પૂર્ક પર પેટ કરશે.
- ઉમેદવાર પરીક્ષાનો સમય પૂરો થાથી પછી તુરત જ પરીક્ષા હોલ્ડ છોડતા પહેલા, બધાપણે પૂર્ક પૂર્ણ (વપરાયેલ/ન વપરાયેલ) સુપરવાઈઝરને ઉત્તરવહી સાથે જમા કરવાની રહેણે. જો તેમ કરવામાં નિયમ જણે તો ઉમેદવાર સામે યુનિવર્સિટીના નિયમો મુજબ કાર્યવાતી કરવામાં આવશે.
- જ્યાં સુધી ઉમેદવારની પૂર્વ ન કરે અને ઉત્તરવહીનો જમા કરવામાં ન આવે ત્યાં સુધી ઉમેદવારને પરીક્ષા હોલ્ડમાંથી ભાદર પ્રશ્નપત્ર પણ લઈ જવાની મૌજૂદી આપવામાં આવશે. નહીં.
- ઉત્તરવહી પૂર્ક પૂર્ણ કોઈપણ તુકસા/કાંઈવું/ળાણી લેવું/લઈ જવું એ નિયમ વિદ્ધ આચારથી છે અને તેના માટે શિસ્તાંગની કાર્યવાતી કરવામાં આવશે.
- જે ઉમેદવાર સુપરવાઈઝરની સુચનાનો અનાદર કરશે અથવા મારવાની યુનિવર્સિટીની પરીક્ષાનોની આચારસંહિતાનો બંગ કરશે અથવા ગેરવર્તન કરશે અથવા ઉલ્લંઘન કરશે તો ઉમેદવાર સામે શિસ્તાંગની કાર્યવાતી કરવામાં આવશે.



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Q.  
No.

Q.17

C.A)

## Problem Reduction

## constraint Satisfaction

- we have to reduce problems into subproblems → we have to satisfy constraints using X and D
- ex. in real world, if a taxi have to go to bedi, divide it like from madhupur, ADB, bedi → for taxi, have to go to bedi, define the constraints like start taxi, go to ADB, check Petrol etc.
- second one take exams ← in this, if we of students then take lectures set Patis, set exam time, inform students have to take exam constraint, variables and domains should be defined and in constraint, we've to divide problems.

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Q.  
No.

→ in other place  
would problem, if  
we take like go!  
to go a. Aesthsip.  
then in this we have  
to first find problem  
of education like book  
ticket, book hotel

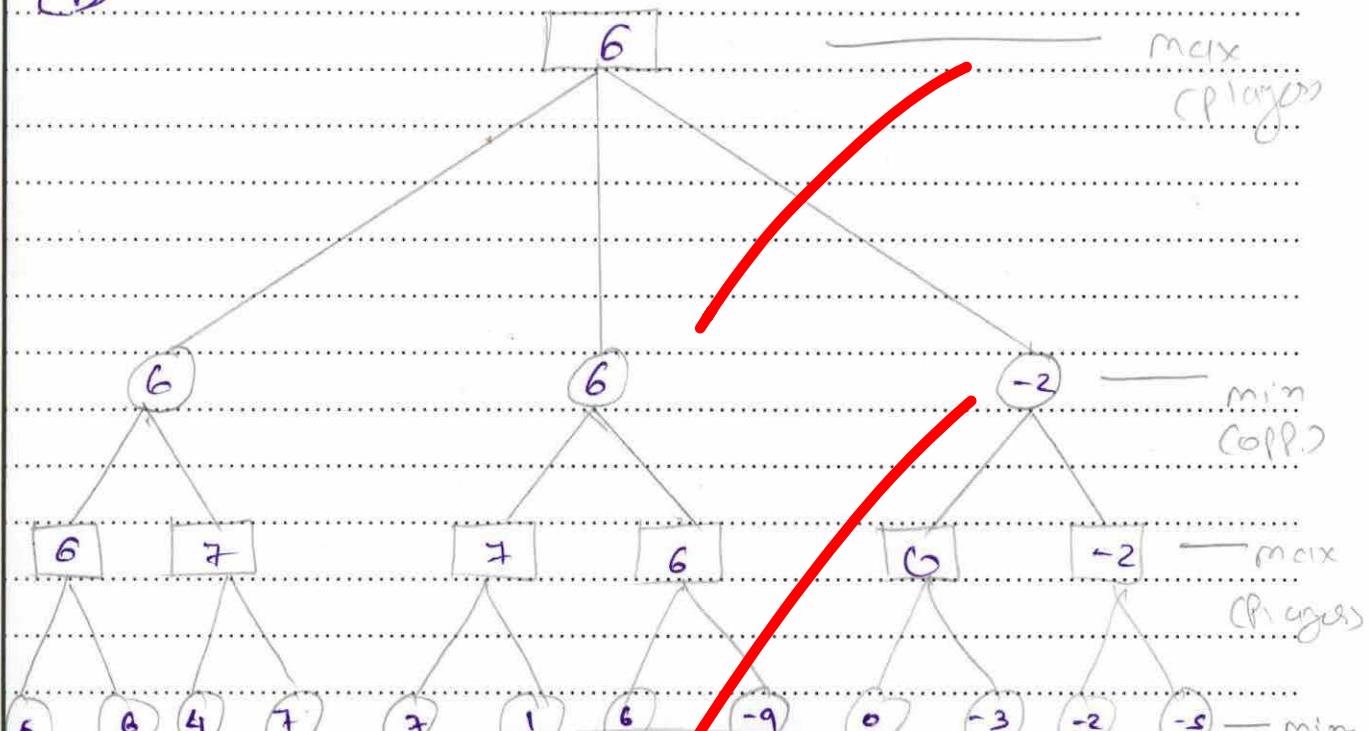
→ in this, we  
have to find feasible  
domain and constraints  
then we have to  
find solution which  
satisfies all the  
constraints like  
book ticket, book  
hotel etc.

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Q.  
No.

L.B



6

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Q.  
No.

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Q.  
No.

Q.2)

(A)

(1) likes (Bhaskar, aeroplanes)

(2) Father (Fathers (John), Eve)

(3) mom (Picot)

(4) likes (Ravi, mangoes)

(5) give (Simus)

(6) red (Roses)

(7) owns (John, gold)

(8) taller (Ravi, mother)

(9) my name (Rocky)

(10) fruit (Apples)

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Q.  
No.

(B) Limitations of hill climbing to find global maximum:

→ In hill climbing there are mainly two max values  
 (1) global maximum  
 (2) local maximum

→ Now, when current state is at local maximum, and goes ahead the value will be decreasing as per given in diagram



→ Now, after that current state will not move further because it thinks that the global max. is arrived and next values are decreasing.

→ So, because of it, we cannot find global maximum.

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Q.  
No.

- Once, the local maximum value is arrived, the next values will be continuously decreasing.
- So, the state will identify it as global maximum only.
- So, we have to identify the value of local maximum as global maximum and we cannot determine nature value of global maximum.
- For that, we have to check whole graph and don't stop at global maximum.



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Q.  
No.

Q.32

(A) Applications of AI:

→ In real environment, there are many applications of AI available in real world.

## (1) mail Spam detection:

→ The first one is spam email. If the email is spam or not then we can check using AI.

## (2) Data mining:

→ The another approach is data mining. In data mining, we use different AI techniques.

## (3) Speech recognition:

→ In speech recognition, we use AI to recognize the voice of given input command.

## (4) washing machine:

→ In digital automatic washing machine we use AI to detect commands like wash, spin, water level etc.

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Q.  
No.(5) NLP!

→ In NLP, we use AI to process the languages and do some tasks.

(6) Recommendation engines:

→ In the many recommendations techniques we use AI like for movie recommendation, music recommendation, we use AI techniques.

(7) Mood detection:

→ In mood detection, we use AI to detect user's mood like happy, sad, etc.

(8) Stock market Prediction:

→ one of the most real world application is stock market price prediction whether it will increase or decrease.

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Q.  
No.(B)(1) discourse Phase:

- The last second phase of NLP is discourse Integration Phase.
- After calculating a meaning from past 3 phases, it comes to discourse integration phase.
- In this phase, we check that the given sentence has past connection with previous sentence or not.
- if it indicates the integrity of the past sentence or not.

ex: Dishant is a boy.  
He plays cricket.

- Now, in the example, there are two sentences. Now in second sentence, we can see that it is like 'he plays cricket'. Now if we check the previous sentence that it indicates that there is a boy named dishant who plays cricket.
- so, it has connection with the previous sentence.
- if the second sentence is denoted alone, then we cannot identify the person whose mention is there.
- This is how discourse Integration Phase works.

$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

Q.  
No.

## (2) Pragmatic Phase:

- This is the last phase of NLP in which, we check the extra factors for that sentence.
- like tone, environment, the actual meaning of that sentence.
- In second humans say same sentence for different meaning.
- it may be meant on cingees or anything else.
- This phase identifies that extra factor behind that sentence.

Ex Police officer says that 'get him down'

- The actual meaning according to sentence is like get him down on his knees but
- police officer's meaning can be like kill him.
- So, for a sentence, there can be different meanings and Pragmatic Phase identifies their meaning.

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Q. 4)

(A) Forward Reasoning:

- In forward reasoning, we are given with a initial state or initial date.
- Based on that date or state we identifies the goal state and reach there.
- This is called forward reasoning in which, we go to the next step from initial date or state & identifying of go to the goal state.
- But in backward reasoning, we are given with the goal state & we have to find initial state.
- For example, ~~we~~
  - There is one disease called COVID-19, and the goal state is its medicine or it's vaccine.
  - So, applying forward reasoning we can identify and find the goal state.

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(B)

→ In non linear planning, constraint posting is very important

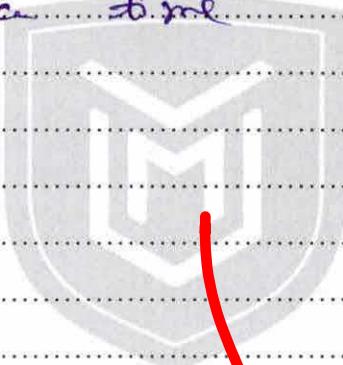
→ In non linear planning, we do more than one task simultaneously and in that we use constraints.

### posting

→ So, in non linear planning, we have to do tasks parallelly & rather than sequentially

→ in state space, we do task sequentially & one task at a time only

→ but in this, we do more than one task at a time

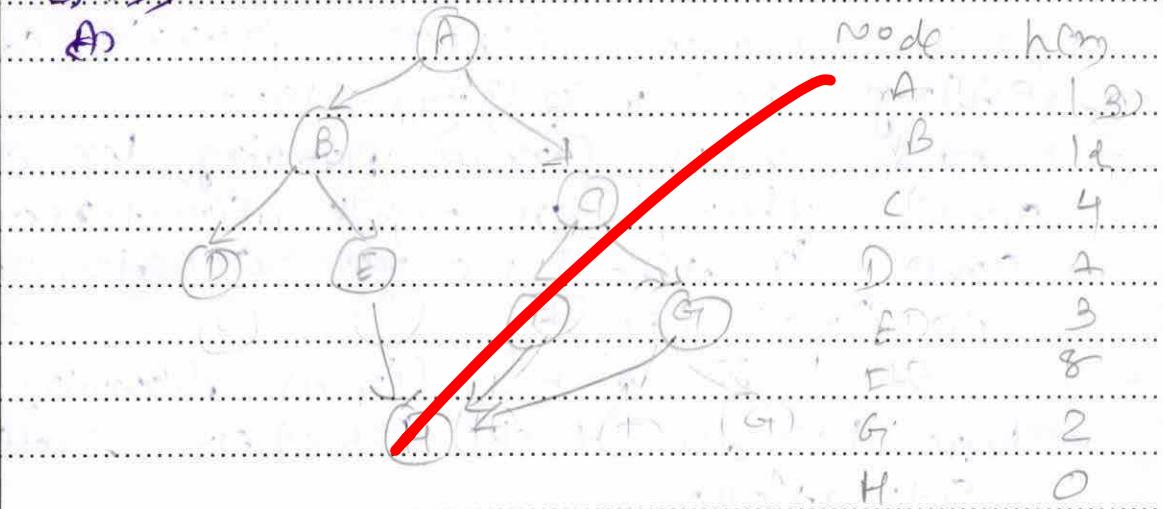


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Q. 37

A)



$$A \rightarrow B : 1.3 + 1.2 = 2.5$$

$$A \rightarrow C : 1.3 + 4 = 5.3$$

min. Path

$$(A \rightarrow C \rightarrow E) : 1.3 + 4 + 8 = 25$$

$$(A \rightarrow C \rightarrow D) : 1.3 + 4 + 7 = 19$$

for

$$(A \rightarrow B \rightarrow D) : 1.3 + 1.2 + 7 = 32$$

$$(A \rightarrow B \rightarrow E) : 1.3 + 1.2 + 8 = 28$$

$$(A \rightarrow B \rightarrow E \rightarrow G) : 1.3 + 1.2 + 8 + 0 = 28$$

$$(A \rightarrow B \rightarrow D \rightarrow H) = \text{Path not formed}$$

$$(A \rightarrow C \rightarrow F \rightarrow H) : 1.3 + 4 + 8 + 0 = 25$$

$$(A \rightarrow C \rightarrow G \rightarrow H) : 1.3 + 4 + 2 + 0 = 19$$

∴ best option Path

$$A \rightarrow C \rightarrow G \rightarrow H$$



$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

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## (B) Best - First Search:

→ for best first search, the function for the cost is  
 $f(n) = h(n)$

→ So, we've to find the path which is most optimal and lowest at cost

→ let's see each step with example

## (C) get the heuristic values

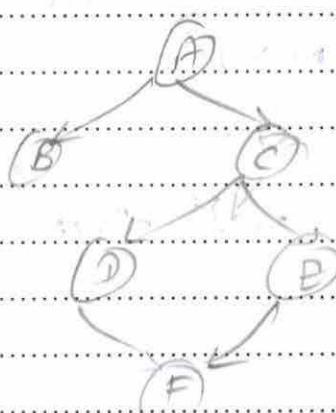
→ we've to find the heuristic value for the state according to goal state

→ the formula is:

$$\sqrt{(x_2 - x_1)^2} = \sqrt{(y_2 - y_1)^2}$$

→ the x and y are coordinates for the graph where  $x_1$  is for the current state and  $y_2$ ,  $y_1$  is for the goal state

→ Assume we've found  $h(n)$  for this graph

Node  $h(n)$ 

A	13
B	12
C	10
D	7
E	3
F	0

$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

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No.

(2) now identify child node for the current node there are two paths.

$$A \rightarrow B$$

$$A \rightarrow C$$

→ find  $h(n)$  value and add in parents value

$$A \rightarrow B : 13 + 12 = 25$$

$$A \rightarrow C : 13 + 10 = 23$$

→ min. value is  $A \rightarrow C$ , so we go for  $A \rightarrow C$

(3). Continue till most optimal path doesn't change

→ so here, the process will repeat till we get Path which is  $A \rightarrow C \rightarrow E \rightarrow F$  with cost = 26

$$A \rightarrow C \rightarrow E : 13 + 10 + 3 = 26$$

$$A \rightarrow C \rightarrow D : 13 + 10 + 7 = 30$$

$$A \rightarrow C \rightarrow E \rightarrow H = 13 + 10 + 3 + 10 = 26$$

goal state reached

→ This is how best first search works



$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

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**20**

$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

Q.  
No.**DO NOT WRITE ANYTHING IN THIS PORTION**



$$\boxed{\phantom{0}} + \boxed{\phantom{0}} + \boxed{\phantom{0}} + \boxed{\phantom{0}} + \boxed{\phantom{0}} + \boxed{\phantom{0}} = \boxed{\phantom{0}}$$

21

Q.  
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**22**

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Q.  
No.**DO NOT WRITE ANYTHING IN THIS POSITION**

$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

23

Q.  
No.



24

$$\boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} + \boxed{\quad} = \boxed{\quad}$$

Q.  
No.



DO NOT WRITE ANYTHING IN THIS PORTION

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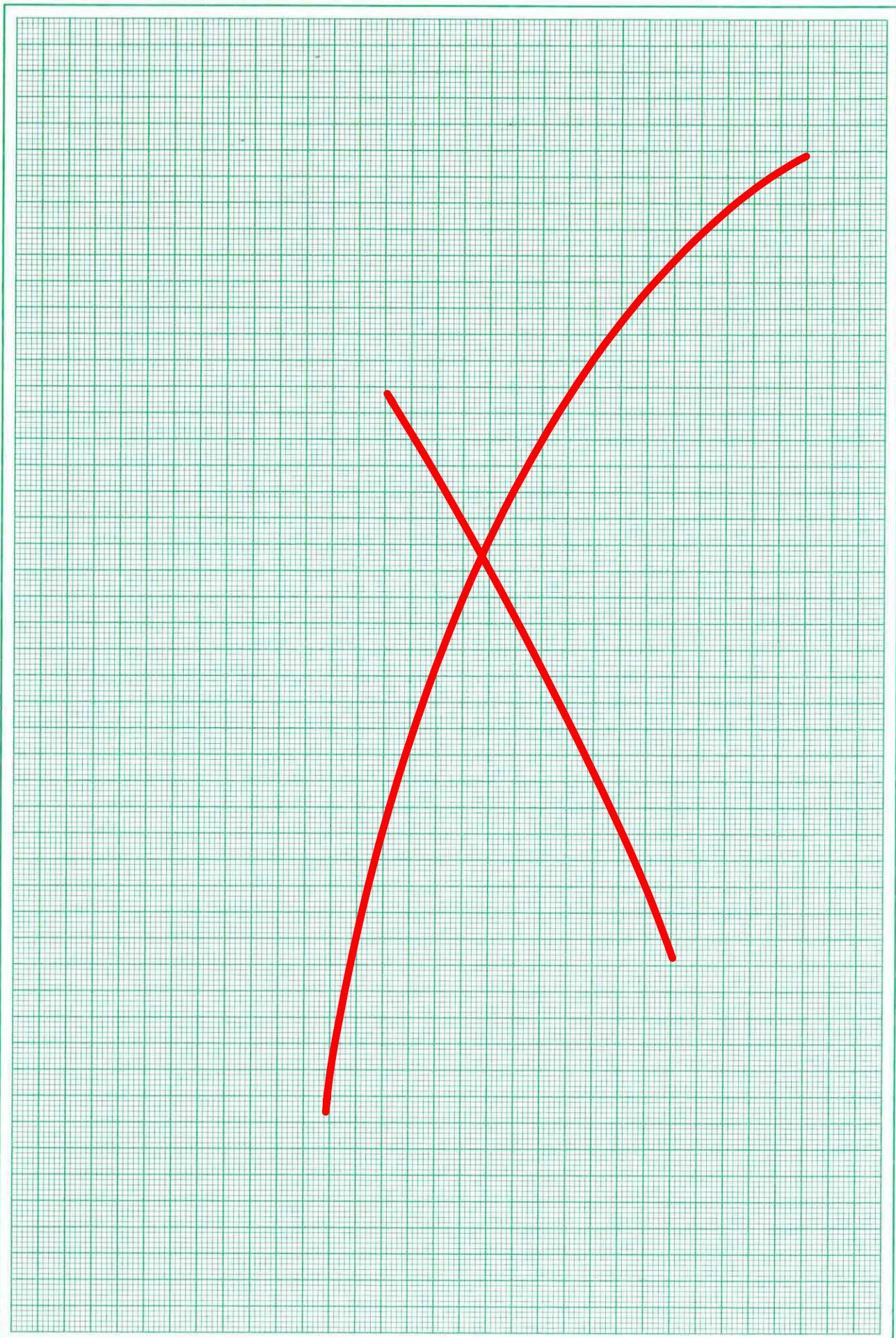
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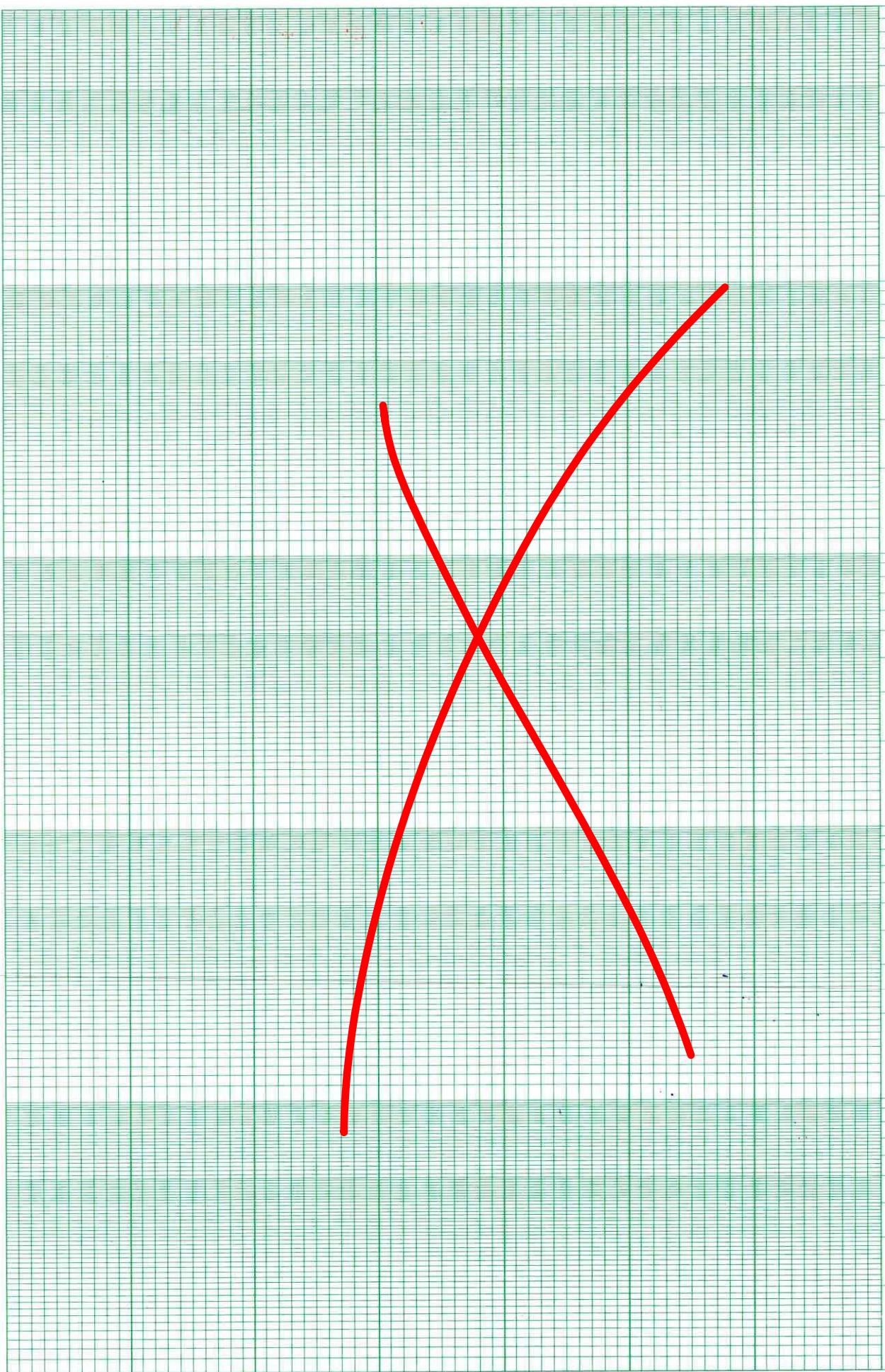
feeder (feather Grader, etc.)



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Mathematical Induction