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**Department of Psychology**

Experiment / Test No. : 5

Date : 23/3/2019

Title of the Experiment / Test : Serial Learning.

Subject's Name : H.T.

Student's Name : Madhura Vivek Pawar.

Class : MA (I) Roll No. : 1865/20



Signature of the Teacher



## Serial Learning.

### - STATEMENT OF THE PROBLEM:-

To study the effect of serial position on speed of learning.

### - INTRODUCTION:

#### 1) Definition of Learning:-

"Learning is defined as relatively permanent change in behaviour as a result of practice or experience." [Morgan and King].

"Learning can be defined as process of change in one's way of responding resulting from environmental conducts."

#### 2) Serial Learning:-

Serial learning technique is one of the major methods developed by psychologists to measure verbal learning. In serial learning method each item of learning material is provided before the subject one by one in serial order with short span of interval in between (usually 2 seconds.) each items. In serial learning one has to learn not only the words or syllables but also the serial position in which the items are vertically related to each other i.e. which word or syllable proceed or follows the particular word or syllable being learnt. This method is useful in study the process of relatively more active search and retrieval from memory store. The process of exposure is repeated continuously till the learner reaches the criterion of learning.



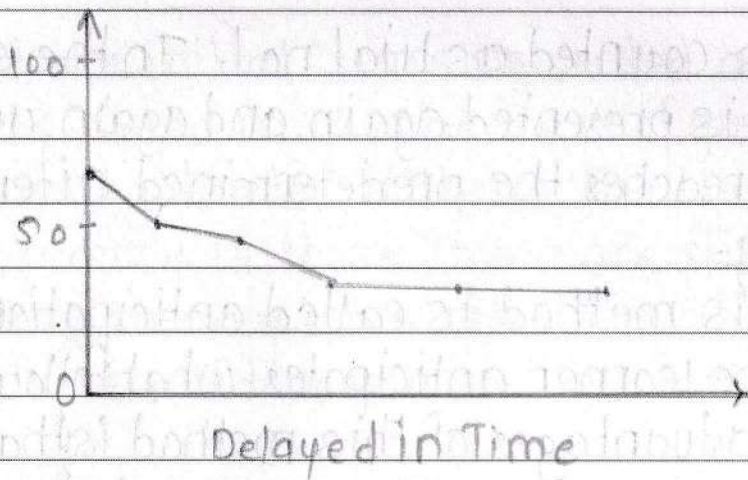
8) Ebbinghaus Contribution In Serial Learning:-  
Verbal learning materials includes all the cases of learning by using words responding to or with. In addition, numbers, non-sense syllables, code language, verbal signs etc. also constitute material for verbal learning.

A German psychologist Herman Ebbinghaus in 1880 was first to develop nonsense syllables for experimental studies on verbal learning. He was indeed the first to experimentally investigate the properties of human memory. Influenced by the British Empiricists, Ebbinghaus assumed that the process of committing something to memory involved the formation of new associations would be strengthened through repetition.

Ebbinghaus constructed a list of about 20 items and then proceeded to memory these systematically. Ebbinghaus discovered that the ability to recall the items improved as the numbers of repetition went up rapidly at first and then more slowly and the list was finally mastered. This led to the development of learning curve.

He also found out that forgetting occurs most rapidly soon after the end of practice but the rate of forgetting slowed as time went on and fewer items could be recall. This finding led to development of forgetting curve.





#### 4) Methods of Serial Learning :-

##### A) A Method of complete presentation :-

In this method, all the items are presented to the subject at once. The learner may then read and re-read all the items and continue to repeat the process until all the items are fully learnt.

This is called the method of complete presentation. Since the entire list of items is presented to the learner at the same time. This method is advantageous because the entire material is learnt as an integrated whole and not in parts eg. learning a poem.

##### B) Anticipation Method :-

This method is called serial anticipation method.

In this method, the items are presented one at a time for a brief second e.g. 2 second. After exposing whole list once, the subject is shown item one for two seconds with which the listener is required to anticipate the next item. Then he or she is presented with the item no. and the subject is again required to anticipate the third item of the list. The same procedure is followed till end of list and hence completion of this anticipation



trial is counted as trial no. 1. In the same way, the list is presented again and again until the learner reaches the predetermined criterion of learning.

This method is called anticipation as in each trial, the learner anticipates what follows next. One of the advantages of this method is that the effect of knowledge of result, operator does automatically in the procedure because in every anticipation the correct item is exposed as stimulus item to the subject that provides knowledge to the learner or whether he has failed in anticipating the response item. This kind of automatic feedback of great motivational value in learning.

5) Serial Position Curve:-

“Serial position effect is the tendency of person to recall the first and last items of a series the best and middle items worst.”

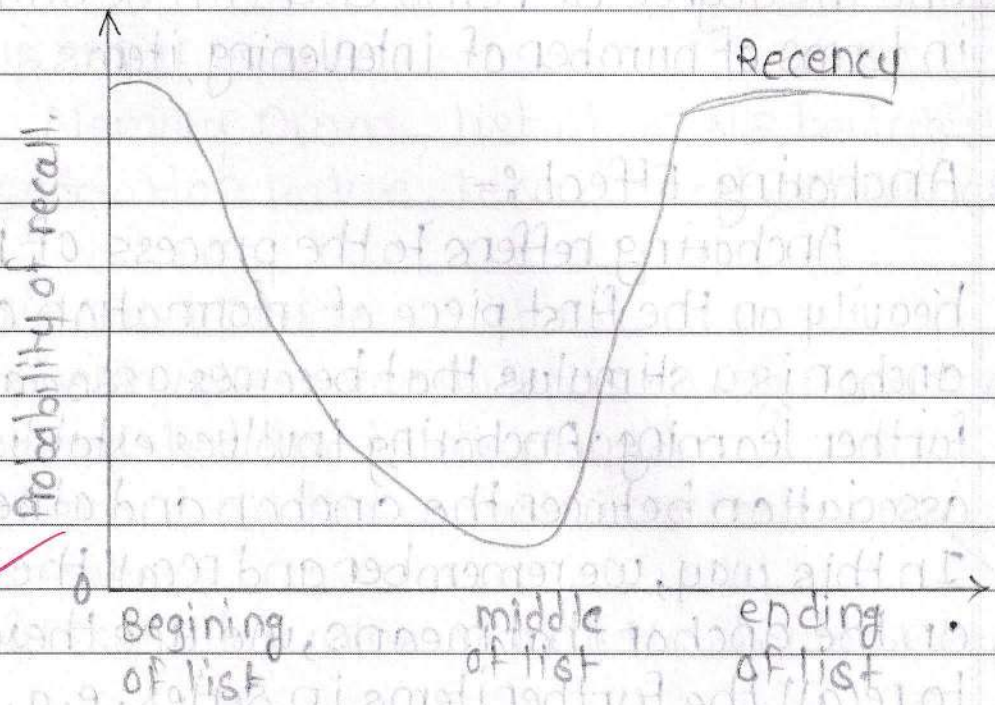
Serial position curve is a U-shaped learning curve that is normally obtained while recalling a list of words first described by Nipher. The serial position curve can be defined as 'U-shaped' relationship between a word's position in list and its probability to recall.

The serial position effect consist of two phenomenon - primary effect and recency effect. The primary effect refers the better recall of first items of the list than middle items. The recency effect refers to better recall of items from end of list than middle items of list.

One suggested reason from primary effect is



That the initial items presented are most effectively stored in LTM because of greater amount of processing devoted to them. The theorised reason for recency is, these items are still presented in working memory when recall is solicited, so middle items recalled poorly.



### 6) Types of association in serial learning :-

In his experimental investigations, the Ebbinghaus reported evidence of at least three classes of association that may found in serial learning :-

e.g. A B C D E F G H. is the list.

i) Immediately successive forward association.

e.g. A-B and B-c

A B C D E F G H

ii) Immediately successive backward association.

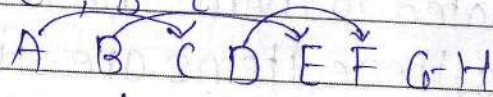
e.g. B-A and C-B.

A B C D E F G H



iii) Association between items that are not immediately adjacent. ☒

e.g. A-C, B-E



Non adjacent associations which may be either forward or backward are called remote associations and the degree of remoteness can be stimulated in terms of number of intervening items.

7) Anchoring Effect :-

Anchoring refers to the process of relying heavily on the first piece of information offered. An anchor is a stimulus that becomes associated with further learning. Anchoring involves establishing an association between the anchor and other items. In this way, we remember and recall the items based on the anchor that means, we use these anchors to recall the further items in series. e.g. Box will serve as an anchor for PRT. The anchor serves as retrieval or recall cue. The retrieval depends on association strength.

e.g. BOX PRT

The problem with this effect is that all the items to be recalled are based on the anchor. Hence if we forget, the anchors, we forgot the items as well.

7) HYPOTHESES :-

The first items in the series will be learned fastest, speed of learning will decrease near the middle of the series and then rise again.



## - VARIABLES :-

Independent variable :- Serial position of an item.

Dependent variable 1 :- No. of error per neutral stimulus.

Dependent variable 2 :- No. of trials required for mastery.

## - MATERIALS :-

Memory Drum, list of 12 NS having similar association value, record sheet, stationary.

## - PRECAUTION :-

i) Check whether subject is giving response only when dotted line is displayed.

ii) Record all the correct, incorrect, incomplete responses.

iii) Association value of each NS should be kept similar.

## - PROCEDURE :-

The experimenter checked the all the material and cubical was arranged. The subject was called inside the cubical and seated carefully comfortably.

Then instructions were given to the subject :-

“ This is a learning experiment. I am going to display few NS (neutral stimulus) through the window of this apparatus (give example). Each NS will be displayed for 2 secs when, I will say start, a dotted line will appear in a window which will be followed by NS. In this way. The whole list will be displayed to you. You have to read each NS carefully. When the same list will be displayed, again you have to anticipate each NS. before it



appears. The correct Ns will appear again whether or not you have attempted to anticipate it. This will serve to verify or correct your answer. When you will be able to tell all the Ns in their proper sequence twice consequently. We would stop the experiment."



- RESULT TABLE:-

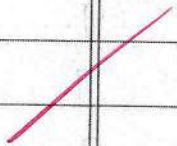
SR No.	NS	Trial									CR	Error
		1	2	3	4	5	6	7	8	9		
1	KAB	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0
2	CJH	RUK	CYZ	✓	CYZ	✓	✓	✓	✓	✓	6	3
3	RUK	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0
4	JEV	✓	CYZ	XIC	✓	✓	✓	✓	✓	✓	7	2
5	CYZ	WEK	✓	✓	✓	✓	✓	✓	✓	✓	8	1
6	WEH	WEAWIZ	XIC	XIC	✓	NYZ	NYZ	✓	✓		3	6
7	NYX	POB	CJH	MUP	XIC	NYZ	NYZ	NYZ	✓	✓	2	7
8	XIC	ZYC	XCI	✓	MUP	WEH	✓	✓	✓	✓	5	4
9	MUP	KAB	XIC	✓	✓	✓	✓	✓	✓	✓	7	2
10	VOD	POB	RUK	✓	✓	✓	MIH	✓	✓	✓	6	3
11	MIH	RUK	XYZ	POB	✓	✓	✓	✓	✓	✓	6	3
12	POB	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0
Total CR		4	4	8	8	10	9	10	12	12		

SR No.	NS	No Response	Intraserial	Extraserial
1	KAB	0	0	0
2	CJH	0	3	0
3	RUK	0	0	0
4	JEV	0	2	0
5	CYZ	0	0	1
6	WEH	0	2	4
7	NYX	0	4	3
8	XIC	0	2	2
9	MUP	0	2	0
10	VOD	0	3	0
11	MIH	0	2	1
12	POB	0	0	0



- INTROSPECTIVE :-

"The experiment was very interesting. I liked it so much. I got little confused between 5th and 6th word, other words were easy for me. It was easy for me to remember first and last word, for other words, I tried to remember them serially."



No.	Word	Remembered
1	PAR	0
2	CH	0
3	DIR	0
4	FEV	0
5	CY	0
6	WTH	0
7	NYX	0
8	XTC	0
9	MUP	0
10	VAD	0
11	PTH	0
12	POB	0



## - DISCUSSION :-

Statement of the problem is, to study the effect of serial position on speed of learning.

"Learning is relatively permanent change in a behaviour as a result of experience or due to practice."

Cubical was arranged, experimenter checked all the material. Subject was called inside the cubical and seated comfortably. Then instructions were given to subject.

Hypothesis was that, the first items in the series will be learned fastest, speed of learning will decrease near the middle of the series and then rise again.

For neutral stimulus 'KAB' no. of correct response is 9 and error is 0. which refers that it is easy for subject to remember this stimuli and subject has reported the same in her introspection.

For neutral stimulus 'RQICJH' no. of correct response is 6 and 3 errors are there which are intraserial errors. subject has said 'ROK' and 'CYZ' as a response for 3 times.

For neutral stimulus 'ROK' no. of correct response is 9 and there are no errors.

For neutral stimulus 'JEU' no. of correct response is 7 and there are 2 errors which are intraserial. Subject has given 'CYZ' and 'XIC' as a response.

For neutral stimulus 'CYZ' no. of correct response is 8 and there is 1 error which is extraserial. Subject has given 'WEX' as a



response.

For neutral stimulus 'WEH' no. of correct response is 8 and there are 6 errors, among these 2 are intraserial (XTC) and 4 are extraserial (WEA, WIZ, NYZ).

For neutral stimulus 'NYX' no. of correct response is 2 and errors are 7, among these 4 are intraserial and 3 are extraserial.

For neutral stimulus 'XTC' no. of correct response is 5 and there are 4 errors, among which 2 are intraserial (MUP, WEH) and 2 are extraserial (ZYC, XCI).

For neutral stimulus 'MUP' no. of correct response is 7 and 2 errors are there, they are intraserial. Subject has given KAB and XTC as a response 2 times.

For neutral stimulus 'VOD' no. of correct response is 6 and errors are 8, they are intraserial. Subject has given POB, RUK, MTH as a response 3 times.

For neutral stimulus 'MTH' no. of correct response is 6 and errors are 8, among which 2 are intraserial (RUK, POB) and 1 is extraserial (XYZ).

For neutral stimulus 'POB' no. of correct response is 9 and there are no errors.

There are three graphs, which shows correct response per trial, Errors per NS and correct response per NS. From first graph it can be seen that no. of correct responses are increased trial by trial. From graphs showing error and correct response per NS indicates



that subject has remembered 1<sup>st</sup> some and last some words from list very easily.

From above discussion and obtained result we can see that primary and recency effect has occurred here. Primary effect is when words in the beginning are remembered/recalled very easily. Recency effect is when words in last (recent) of the list are remembered/recalled very easily. Here we can see that subject has remembered some of beginning and some last neutral stimulus very easily. subject has mentioned in her introspection that it was easy for her to remember first and last words very easily.

#### - CONCLUSION:-

Hypothesis was that, the first items in the series will be learned fastest, speed of learning will decrease near the middle of the series and then rise again. From above discussion it can be concluded that hypothesis is accepted.

#### - REFERENCES.

- 1) Postman L Egan JPC (1949) New York, Experimental psychology an introduction, Kalyni publication



RESULT TABLE :-

List A

												Time
22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24
21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	81
20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	46
19	✓	✓	✓	✓	✓	✓			✓	✓		89
18	✓	✓	✓	✓	✓	✓						32
17	✓	✓	✓	✓	✓	✓			✓	✓	✓	22
16	✓	✓	✓	✓	✓				✓	✓		51
15	✓	✓	✓	✓	✓				✓	✓		50
14	✓	✓	✓	✓	✓	✓			✓	✓		87
13	✓	✓	✓	✓	✓							53
12	✓	✓	✓	✓	✓				✓	✓	✓	92
11	✓	✓	✓	✓	✓				✓	✓		93
10	✓	✓	✓									98
9	✓	✓	✓	✓	✓							97
8	✓	✓	✓	✓	✓				✓	✓		98
7	✓	✓	✓									95
6	✓	✓										116
5	✓	✓	✓	✓	✓							89
4	✓	✓	✓									157
3	✓	✓	✓	✓								203
2	✓											207
1	✓											146
	MTF	BIX	MTW	XTH	VTD	YOP	VTB	WUB	TUX	YOL		



→ List B

		1	2	3	4	5	6	7	8	9	10	11
04	WUN	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
18	KAR	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
24	RUK				✓	✓	✓	✓	✓	✓	✓	✓
38	GEY				✓		✓	✓	✓	✓	✓	✓
58	HUD							✓		✓	✓	✓
80	BOL										✓	✓
102	NID										✓	✓
122	KAY							✓	✓	✓	✓	✓
148	QIT						✓	✓	✓	✓	✓	✓
172	SIM							✓	✓	✓	✓	✓
190	Time	101	152	128	72	95	75	72	82	77	49	89

		LIST A	LIST B
211	% of correct Recall	50	50

INTROSPECTION :-  
 "It was little difficult for me to remember words. I took lots of time for first list. Comparatively words from 2nd list were easy to remember as I could relate it with some words. eg. KAR, RUK. These words were easy as I could relate them in marathi and Hindi language. When there was task of correlation, it didn't hamper my performance. But in second part when new list was given to learn then it was difficult to differentiate words but as I said words from second list were more reliable so it was easy to recall."



Name: Madhura vivek Pawar. Expt. No. \_\_\_\_\_

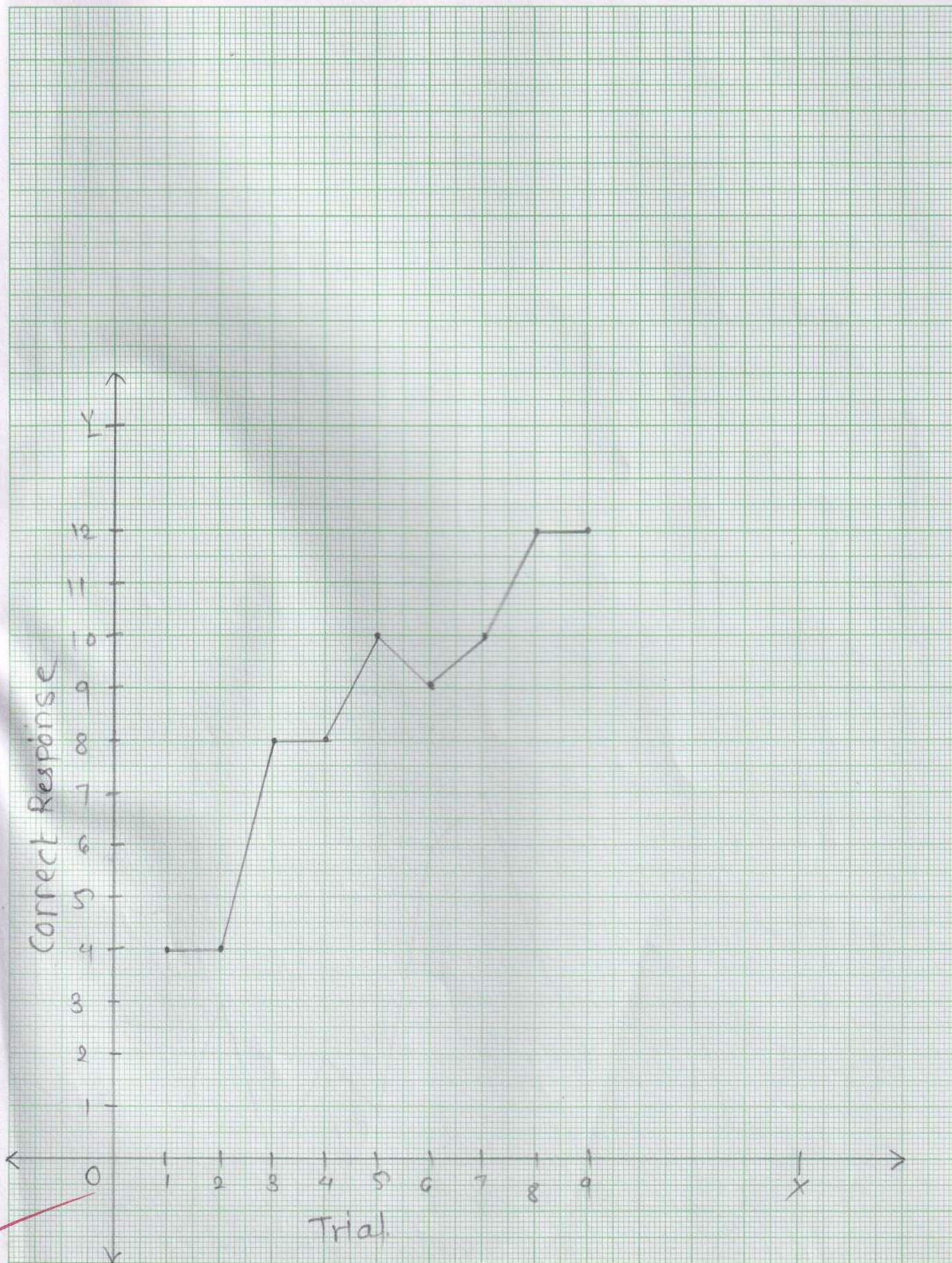
Class: M.A (T) Roll No.: 1865120

Title of the Graph: Graph showing no. of CR Per trial.

Origin = ( )

Slope = \_\_\_\_\_

Scale	
on x - axis, 1 cm =	1 Trial
on y - axis, 1 cm =	1 CR.
Intercept	
on x - axis =	
on y - axis =	





Class: M.A(T) Roll No.: 1865120

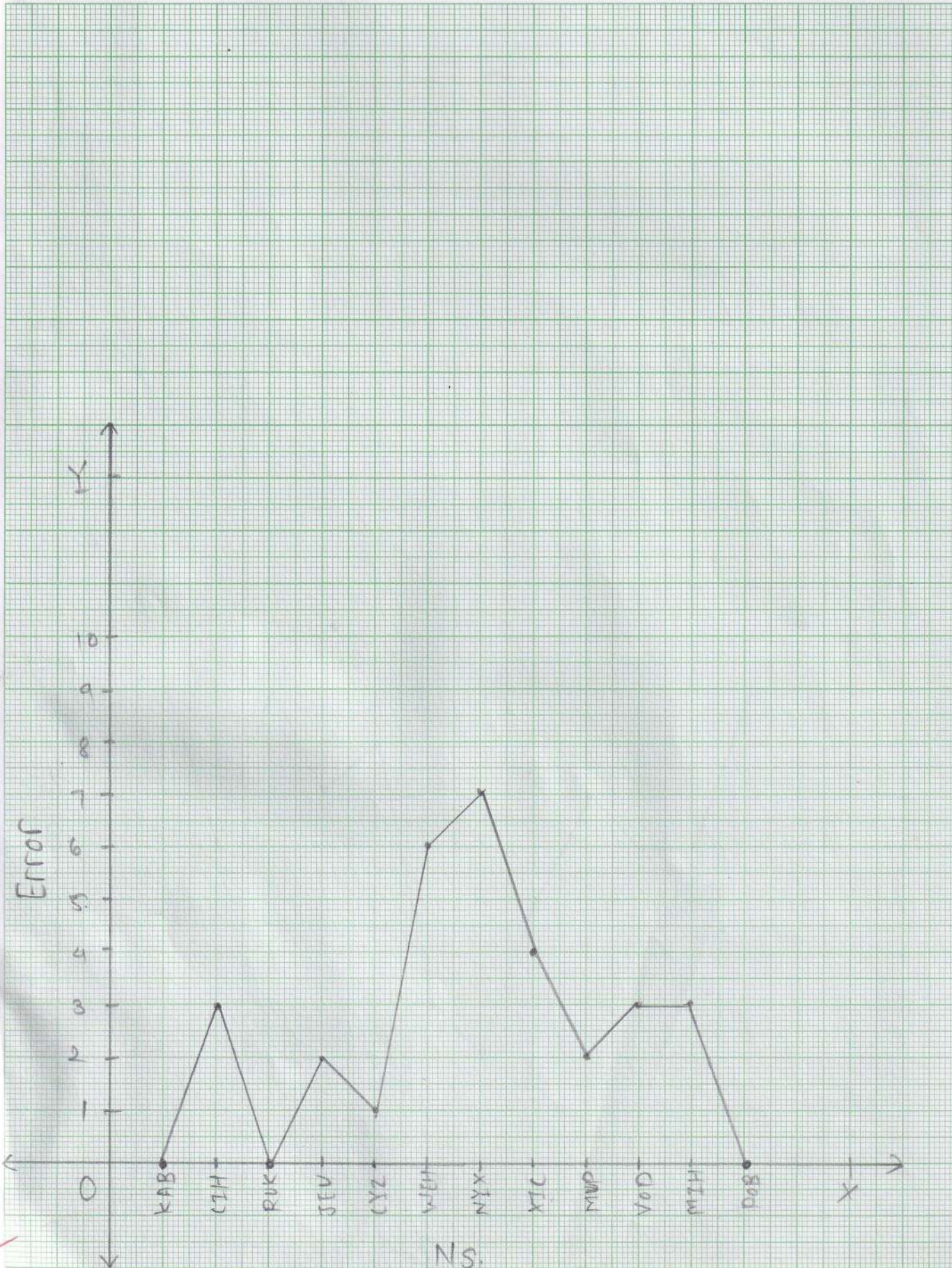
Title of the Graph: Graph showing no. of errors per NS

Origin = ( )

Slope = \_\_\_\_\_

Scale  
on x - axis, 1 cm = 1 NS  
on y - axis, 1 cm = 1 Error

Intercept  
on x - axis =  
on y - axis =





Name : Madhura Vivek Pawar.

Expt. No.: \_\_\_\_\_

Class : MACT Roll No. : 1865120

Title of the Graph : Graph showing no. of ER per NS.

Origin = ( )

Slope = \_\_\_\_\_

Scale

on x - axis, 1 cm = 1 NS

on y - axis, 1 cm = 1 CR.

Intercept

on x - axis =

on y - axis =

