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**Theory of automata**

**Sessional Assignment**

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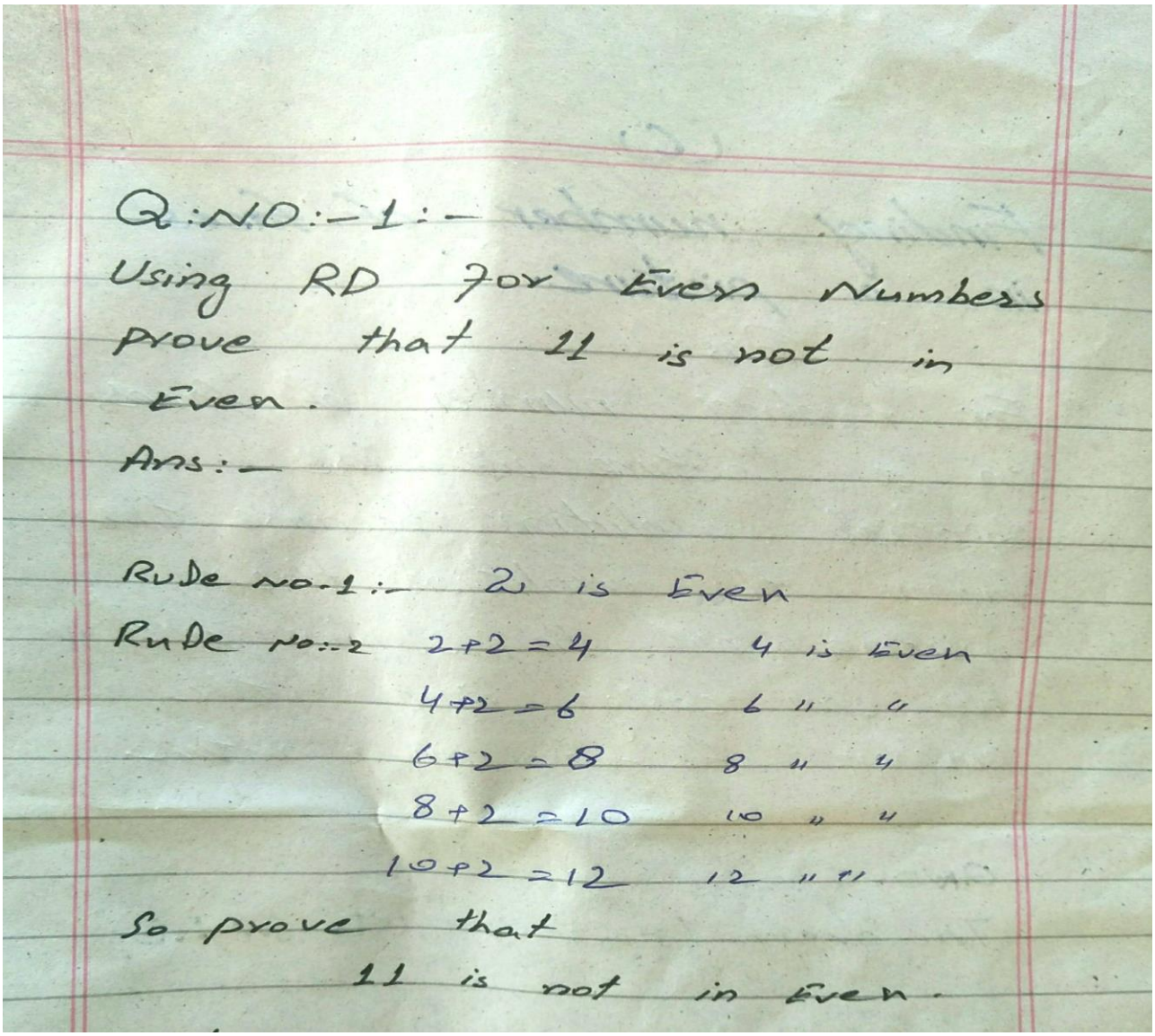

Q:NO:-1:-

Using RD for Even Numbers prove that 11 is not in Even.

Ans:-

Rule no.1:- 2 is Even

Rule no:-2 2+2=4 4 is Even

4+2=6 6 " "

6+2=8 8 " "

8+2=10 10 " "

10+2=12 12 " "

So prove that

11 is not in Even.

Q:NO: 2:—

Design an RD for palindrome and prove that the word aba is in palindrome.

Ans:—

Step 1:- aba is a in palindrome

Step 2:- if x is palindrome then s(x) Rev(s) and xx will be also palindrome where belongs to "ε"

Step 3:- No string except those construction above are allowed to be in palindrome

Q:3:- Using RD for polynomials prove that $5x^3+4y^2-6z+12$ is in polynomial.

Ans:-

Rule 1 5, 4, 5, 12 in polynomial
Rule 2 x y z in polynomial
Rule 3 5*x 4*y in polynomial
Rule 3 $5x^3$ $4y^2$ 5z in polynomial

$5x^3+4y^2-5z+12$ is polynomial.

Q:4 4:-
Design an RD for integers and prove that -4 is in integers.
Ans:-
step:-1:- -4 is in integas.

step2:- if x is in Integer then x-4 are also integer.

step3:- no string except those constructed in are allowed to be integers.

Q:NO:5:—

Theorem (Hint use RD for AE)

Ans:—

Rule 1:— / is not part of any number, so it cannot be included in An AE

Rule 2:— As x does not contains / so as (x) or (-x) cannot contain /.

Rule 3:— As neither x nor y can contain /, so any of the expressions defind by Rule 3 can also contain /

Therefore the character / can never an AE.