

Factor Influencing Disinfection

& their Evaluation

① Concentration →

[DEPTH OF BIOLOGY]

[Conc. of Disinfectant \propto Rate of Disinfection]

⇒ Conc. of disinfectant should not be too less & also should not be too more

'It should be optimum'

ex → The optimum conc. of Phenol is about 1%

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② Temperature ⇒

As the temp. of Disinfectant ↑/se ⇒ Rate of Disinfection ↑/se.

Rate of Disinfection normally ↑/se with Temp

③ Time of Contact ⇒

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Sufficient time of Contact must be allowed for the disinfectant to exert its action.

④ PH → [DEPTH OF BIOLOGY]

A change in PH during disinfectant process can affect the growth of Microbe.

⇒ PH = 6-8 is optimum for the growth of many bacteria & the rate of growth decline on either side of this range.

⇒ Therefore disinfectant should have PH range other than 6-8.

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⑤ Surface Tension ⇒

The contact b/w aq. soln. of disinfectants is needed if they have surfactant property.

⑥ Formulation of the disinfectant ⇒

Effectiveness of Chlorhexidine & quaternary ammonium compounds maybe greater in 70% OH than in aq. soln.

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Evaluation of Disinfectant

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- Referred to check the ability or efficacy of any disinfectant against specific microorg. to establish its effectiveness.
- There are many methods for evaluation of Disinfectant

Some Major Method of evaluation are

- (a) Phenol Coefficient Test (Rideal - Walker Test).
- (b) Chick Martin Test. [DEPTH OF BIOLOGY]
- (c) Kelsey Sykes Test.

(a) Phenol Coefficient Test

In Phenol Coefficient Test, any test chemical disinfectant is compared with Phenol for its anti-microbial activity.

- In this test, we use any of these three Microorganism

- *Salmonella typhi*.
- *Staphylococcus aureus*.
- *Pseudomonas aeruginosa*.

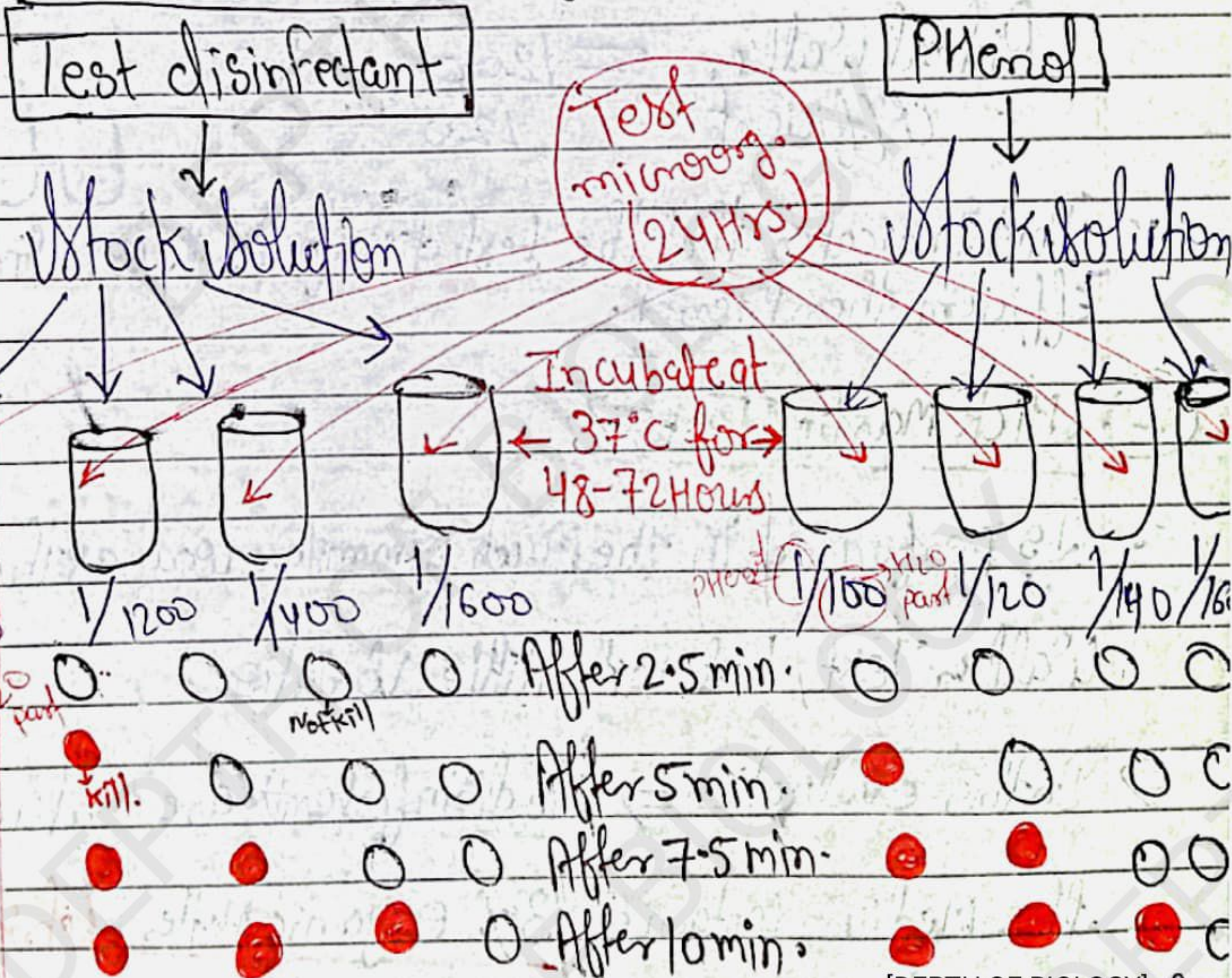
[DEPTH OF BIOLOGY]

The result is shown in the form of Phenol coefficient

⇒ If the Phenol coefficient is less than 1 then test disinfectant is less effective than phenol.

⇒ > (More effective than phenol).

Procedure ⇒ Generally 5 ml of dilution is put in 1 test tube of



Note ⇒ By help of Inoculating loop take sample & Place in recovery culture Media & Check which dilution of disinfectant kill microorg. & how much they take time.

Calculate \Rightarrow

Rideal Walker Coefficient = $\frac{\text{Higher Conc. of test disinfectant that kill microorg. in 7.5 min.}}{\text{not kill in 5 min.}}$

or
Phenol Coefficient.

High Conc. of Phenol that kill Microorg. in 7.5 min. But not kill in 5 minute.

$$\text{Rideal Walker Coefficient} = \frac{1200}{120} = 10 \quad [\text{DEPTH OF BIOLOGY}]$$

* This indicates that the test disinfectant is 10 times more efficient than Phenol.

② Chick Martin Test \Rightarrow

• Is performed in the much similar way as the Rideal Walker Test, but with a little variation.

\Rightarrow In this evaluation \Rightarrow The disinfectant are evaluated in the medium containing 3% Organic Matter (dried Human feces or dried yeast).

$$\text{Chick Martin Coefficient} = \frac{\text{Conc. of test disinfectant that kills microorg.}}{\text{Conc. of Phenol that kill Microorg.}}$$

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3gm Organic Matter

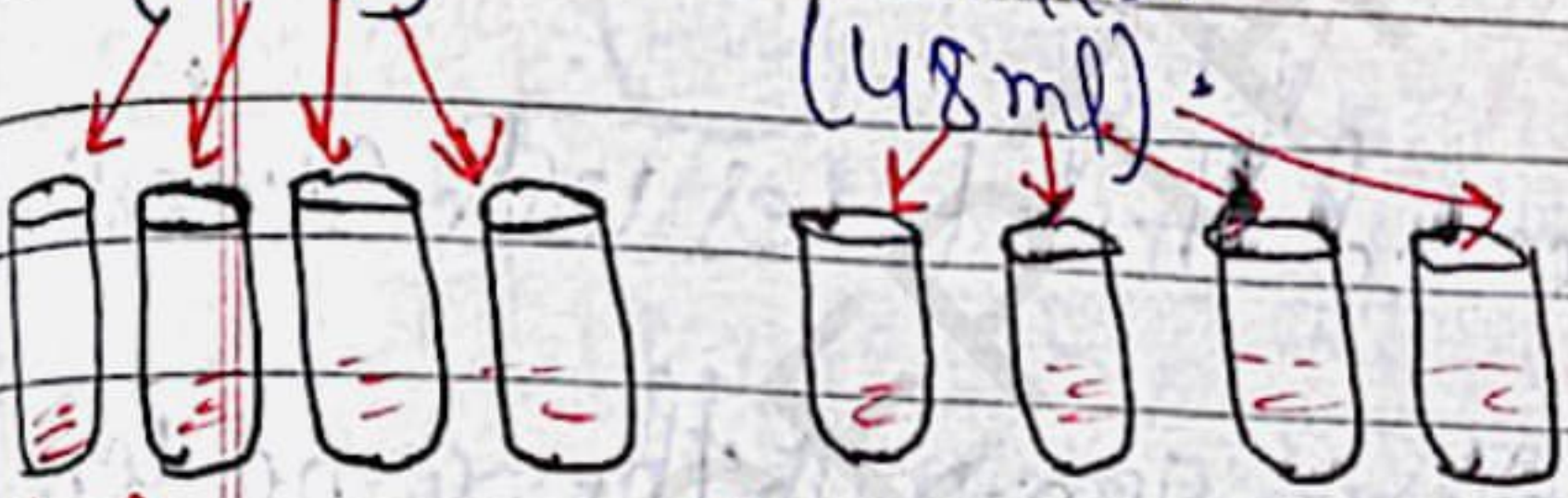
100ml Water

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3% Suspension of Organic Matter

Microorg. (2ml) + 3% Organic Matter (48ml)

Microorg. 24 Hour Old Culture



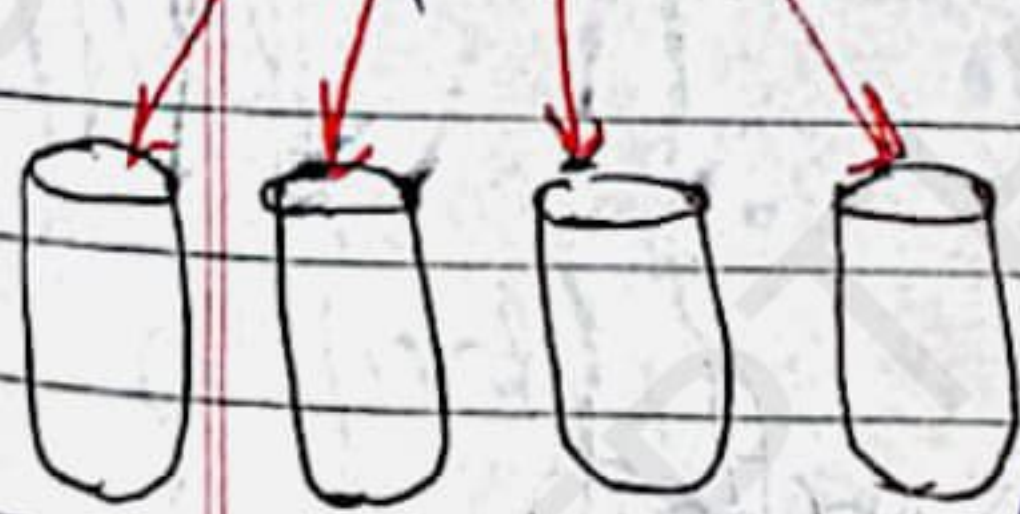
Now remove 2.5 ml in each test tube.

Different Dilutions

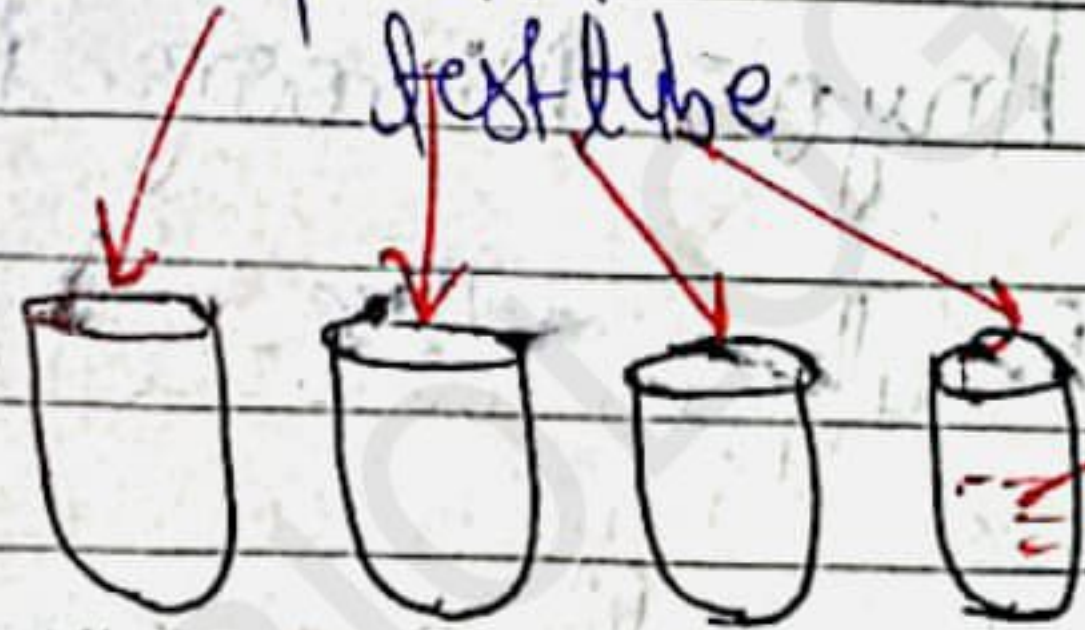
Diff. Dilution test disinfectant 2.5 ml each

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Phenol 2.5 ml each test tube.



test tube



Contain 2.5 ml microbial suspension

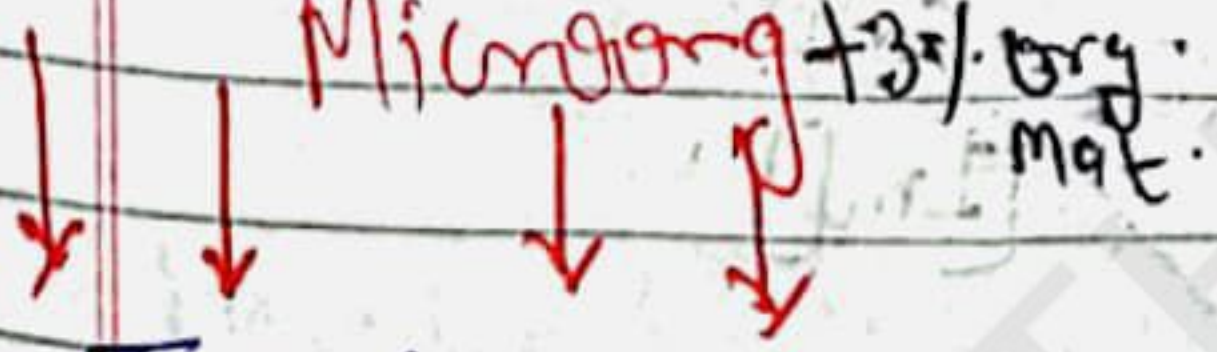
[DEPTH OF BIOLOGY]

Contact allow For 30 Min.

3% Organic Material + Suspension

Phenol & Microorg + 3% Org. Mat.

Test disinfectant & Microorg. + 3% Org. Mat.



Transfer one loopful of rxno Mixture to 10ml. in recovery Culture Media

Inoculate on 37°C for 48 hours.

↓
Observation that which conc. of phenol & test
disinfectant kill microorganism.

③ Kelsey - Sykes Test ⇒

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→ Kelsey - Sykes Test is a triple challenge test.

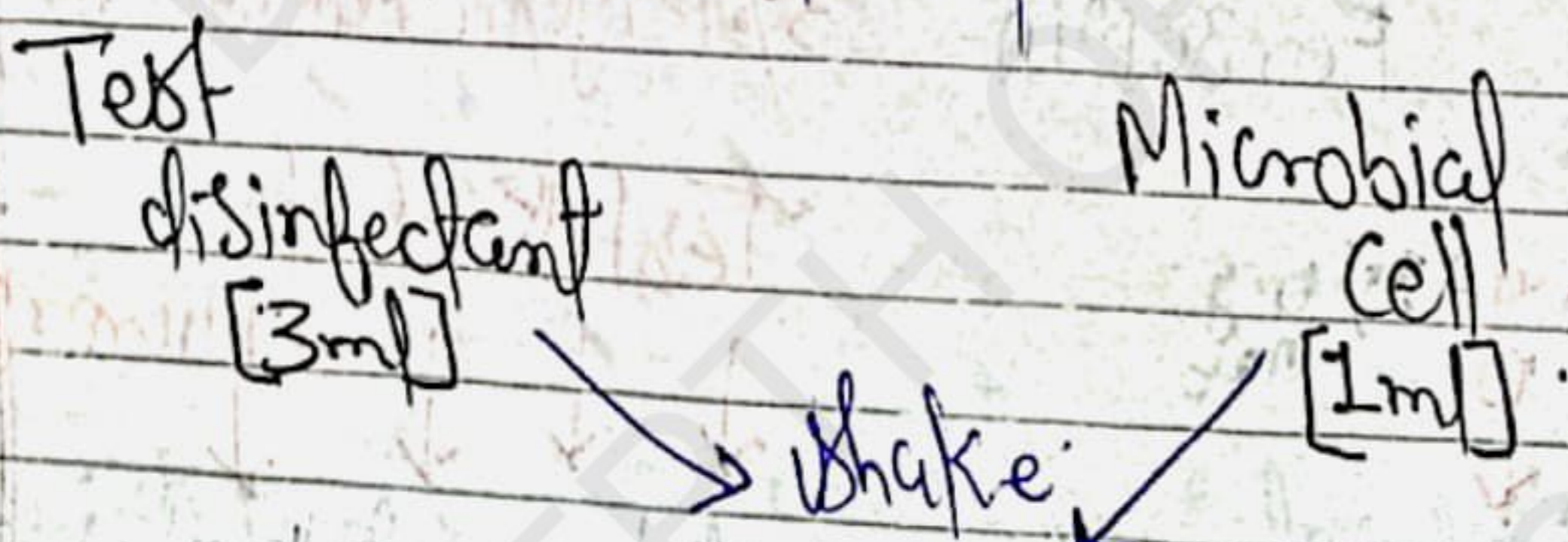
(Test disinfectant checked three times with successive addition of Microbial Suspension with the same conc. of disinfectant).

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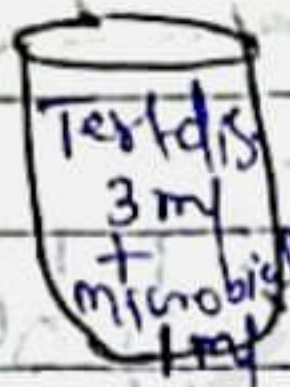
→ Duration of Test: 30 Minute.

→ Any one Microorg. is used for this test *P. aeruginosa*,
P. vulgaris & *E. coli*.

— The result are reported as Pass or fail.



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After 8 min.

Transfer

microbial cell to Nutrient Media to check the disinfectant kill Microbial Cell or Not.

0.1 ml

+ Add more Microbial Cell (1 ml)



0.1 ml

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After 18 min. Again transfer Microbial Cell to Nutrient Media to check the disinfectant kill Microbial Cell or Not

+ Add more Microbial Cell (1 ml)



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After 28 Min

⇒ Here we check (Starting 2 step) में जो 3 Culture Media है वहा पर कल्ल दुरे है या नही Microbial Cell. दोगये तो Test Pass नही तो Fail

[DEPTH OF BIOLOGY]