

DISSOLUTION APPARATUS

1. Match List I with List II [GPAT-2023 SHIFT-II]

List-I	List-II
DISSOLUTION APPARATUS	NAME
1. Type 1	[P] Reciprocating holder
2. Type 5	[Q] Paddle over disk
3. USP App 6	[R] Basket type
4. USP App 7	[S] Cylinder apparatus

Choose the correct answer from the options given below

- | | |
|--------------------------------|--------------------------------|
| (a) 1-[R], 2-[Q], 3-[S], 4-[P] | (b) 1-[S], 2-[P], 3-[Q], 4-[R] |
| (c) 1-[Q], 2-[R], 3-[P], 4-[S] | (d) 1-[P], 2-[Q], 3-[R], 4-[S] |

2. Noyes-Whitney equation predicts [GPAT-2023 SHIFT-II]

- (a) An increase of dissolution rate if the particle size is reduced by micronization because of an increase in area
- (b) Relationship between the radius of the diffusing molecule and its diffusion coefficient
- (c) The influence of electrolyte on the rate constant
- (d) An equilibrium between the surfactant and the drug molecules at the surface of the solution and in the bulk of the solution

3. Select the equation that gives the rate of drug dissolution from a tablet (GATE-1999, GPAT-2021]

- | | |
|----------------------------|------------------------------------|
| (a) Fick's law | (b) Henderson Hasselbalch equation |
| (c) Noyes Whitney equation | (d) Michaelis Menten equation |

4. Type II dissolution apparatus as per USP is [GPAT-2017]

- | | |
|------------------------|----------------------|
| (a) Paddle apparatus | (b) Basket apparatus |
| (c) Flow through celle | (d) Paddle over disk |

5. Apparatus IV as per USP 1 [GPAT-2016]

- | | |
|-----------------------|----------------------------|
| (a) Flow-Through Cell | (b) Paddle |
| (c) Basket | (d) Reciprocating Cylinder |

6. Identify the wrong statement [GPAT-2016]

- (a) Reciprocating cylinder is known as Type III Dissolution apparatuss
- (b) Paddle over disc is known as Type IV Dissolution apparatus
- (c) Rotating cylinder is known as Type VI Dissolution apparatus
- (d) Reciprocating holder is known as Type VII Dissolution apparatus

7. The thickness Gold couting on a USP Dissolution apparatus -1 basket should be [GPAT-2012]

- (a) Not more than 2.5 μ in thickness
- (b) Not more than 0.001 mm in thickness
- (c) Not more than 0.025 μ in thickness
- (d) Not more than 0.1 mm in thickness

DISSOLUTION APPARATUS

➤ Dissolution Test

- To measure the rate and extent at which the active ingredient is released from the tablet and dissolves in a specified medium. It is a key indicator of bioavailability.
- The test is performed in a **Dissolution Test Apparatus**. A specified volume of dissolution medium is placed in the vessel and maintained at $37^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$. Samples are withdrawn at specified time intervals and analyzed.

☐ USP Dissolution Apparatus Types (1-7)

The selection of the apparatus depends on the physical and chemical properties of the drug and the dosage form.

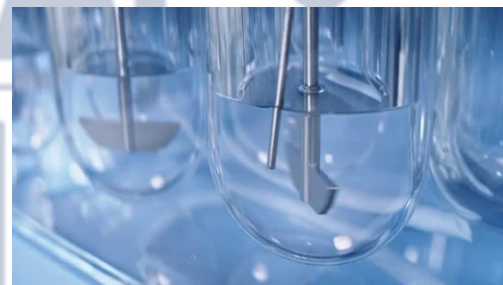
USP Apparatus Type	Name	Typical Dosage Forms
Type 1	Basket Apparatus	Conventional tablets , Capsules, Dosage forms that tend to float or disintegrate slowly
Type 2	Paddle Apparatus	Conventional tablets , Capsules , Orally disintegrating tablets, Chewable tablets , Suspensions
Type 3	Reciprocating Cylinder	Extended-release dosage forms, Chewable tablets , Dosage forms sensitive to different pH conditions (can use different media in each row of vessels)
Type 4	Flow-Through Cell	Poorly soluble drugs, Extended-release formulations, Powders, granules, Implants
Type 5	Paddle over Disk	Transdermal patches
Type 6	Cylinder	Transdermal patches , Dosage forms that are too large for the basket
Type 7	Reciprocating Holder	Controlled-release (CR) formulations , Transdermal systems

TRICK

BA PA RE

FLOW

PA RO RE



➤ Types of Dissolution Apparatus According to IP & BP

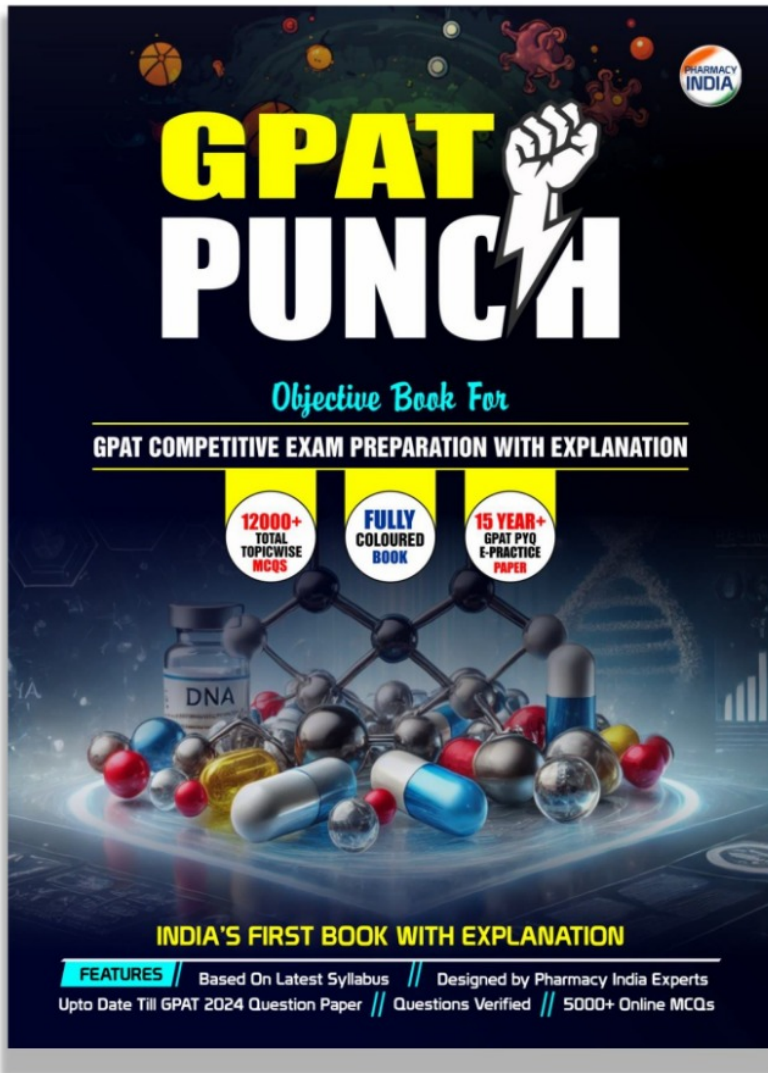
Apparatus Type	BP	IP
Type 1	Rotating basket apparatus	Paddle apparatus
Type 2	Paddle apparatus	Rotating basket apparatus
Type 3	Flow-through cell	-

➤ Comparison between Disintegration & Dissolution Test

Variables	Disintegration	Dissolution
Mesh screen	Mesh screen at the bottom end of the basket	Mesh screen at the bottom end of the basket
Temperature	$37 \pm 2^{\circ}\text{C}$	$37 \pm 0.5^{\circ}\text{C}$
Speed	28–32 cycles per second (CPS)	50–100 rpm
Tablet position	Tablet remains below the surface of the liquid and descends not closer than 2.5 cm (25 mm)	2.3–2.7 cm (23–27 mm)
Medium	PBS pH 7.4	PBS pH 7.4
Volume	900 ml	900 ml



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