GATE-1988

PART - A Section-I (Choose The Correct Answer)

1. Multiple choice question

i. To understand the drug receptor interaction between necessary to quantify the relation
(a) Drug and its toxicity
(b) Drug and its absorption
(c) Drug and its biological effect
(d) Drug and intermediate product

ii. Penicillinase resistance penicillin is
(a) Amoxicillin (b) Ampicillin
(c) Penicillin V (d) Methicillin

iii. Morphine is present in
(a) Atropa belladonna (b) Papaver somniferum
(c) Ricinus communis (d) Solanum nigrum

iv. Ion exchange chromatography is the method of choice for separation of
(a) Metals (b) Sugar (c) Fatty acid (d) Sterols

v. Rideal Walker test is performed by using the strain
(a) Escherichia coli (b) Staphylococcus niruri
(c) Staphylococcus pyogenes (d) Salmonella typhi

vi. Pheniramine maleate is an antihistaminic agent belonging to the class
(a) Ethylenediamine derivative
(b) Cyclic basic class analogs
(c) Aminoallyl ether analoges
(d) None of these

vii. Tetracycline undergo epimerization C-4 between pH 4 and B to give
(a) Is tetracycline (b) Epitetracyclines
(c) Nor tetracycline (d) None of these

viii. Tantalization means
(a) Successive autoclaving with a bactericide
(b) Successive heating with a bactericide
(c) Successive heating at low temperature
(d) Successive autoclaving at low temperature and incubation

ix. Morphine and Heroin differ from each other in respect of
(a) Methyl group on nitrogen
(b) Acetyl groups at C_3 and C_6
(c) Absence of double bond between C_4 and C_6
(d) Absence of D ring

x. Vincristine and Vinblastine act by
(a) Binding with the protein tubulin and arrest at metaphase
(b) Inhibiting the protein synthesis
(c) Acting as antimetabolite
(d) Inhibiting the enzyme system

xi. A rhamne glucoside on complete hydrolysis will give
(a) Aglycone Fructose Rhamnose
(b) Aglycone Ribose Rhamnose
(c) Aglycone Rhamnose Glucose
(d) Rhamnose Fructose

xii. The technique employed to study the insoluble film at oil water interface is
(a) Micellization (b) Deflocculation
(c) Electrostatic balance (d) Film balance

xiii. Gray baby syndrome is due to the indiscriminate use of
(a) Streptomycin (b) Chloramphenicol
(c) Penicillin (d) Tetracycline

xiv. N.N dimethyl-(1-methyl-1-oxo-3,3-diphenylhexyl) ammonium chloride is the chemical
(a) Methadone hydrochloride
(b) Alpha proline hydrochloride
(c) Meperidine hydrochloride
(d) Darvon

xv. Sulphonamide tragedy was due to combination with
(a) Penicillin (b) Streptomycin
(c) Diethylene glycol (d) Bicarbonate

xvi. In the preparation of tablets, powdered medicaments are mixed
(a) To reduce the total volume
(b) To increase adsorption
(c) To increase adhesiveness
(d) To reduce inter particle

xvii. One nanometer (nm) is equal to
(a) 10^{10}cm (b) 10^{-4}cm (c) 10^{-7}cm (d) 10^{-8}cm

xviii. Cholinergic receptor present on intestinal muscle is
(a) H_2 receptor (b) Muscarinic receptor
(c) Nicotinic receptor (d) Beta receptor

xix. Indicate the correct order of increasing eluent power of benzene, ether, chloroform and ethyl acetate
(a) Chloroform < Benzene < Ethyl acetate < Ether
(b) Benzene Ether < Chloroform < Ethyl acetate
(c) Ether Chloroform < Ethyl acetate < Benzene
(d) Ethyl acetate < Ether < Benzene < Chloroform

xx. Limulus test is rapid in vitro of the for parenterals to detect the presence of
(a) Particulate matter (b) Fungus
(c) Pyrogens (d) Bacteria

xxi. An essential requirement of the mobile phase in HPLC is that
(a) It must have constant flow rate with pulses
(b) It must be freshly distilled
(c) It must be run at 20°C only
(d) It must flow with pulses

xxii. Indian (Tinnevelly) and Africa seena leaves differ from other with respect to
(a) Vein islet number (b) Stomatal index
(c) Colour (d) All of these

xxiii. 3-Etherification of morphine molecules causes
(a) Morphine antagonism
(b) No change in activity
(c) Decrease of analgesic and addiction
(d) Increase of analgesic and addiction

xxiv. Addition of electrolyte to a Lysol may cause
(a) Tyndall effect (b) Salting out
(c) Coagulation (d) Dilution

xxv. Salicin, a phenolic glycoside, on hydrolysis yields
(a) Salicylic alcohol + Glucose
(b) Phenol + Glucose
(c) Salicyl alcohol + Glucose
(d) Salicyl aldehyde + Glucose

xxvi. Lignocaine hydrochloride is officially assayed by
(a) Potentiometric titration (b) Acid base titration
(c) Complex metric titration (d) Non aqueous titration

xxvii. In supra ventricular arrhythmia Digoxin when supplemented with _____ is dangerous
(a) Quinidine (b) Procaine (c) Calcium (d) Xylocaine

xxviii. Injection of insulin L.P. should be kept at p" between
(a) 5 and 5.5 (b) 3 and 3.5
(c) 7 and 7.5 (d) 9 and 9.5

xxix. Some adrenocorticoids are referred to as A-corticoids because of
(a) High amount of unsaturation in the molecules
(b) Additional double bond in ring A between carbon 1 and 2
(c) Presence of one double bond in each ring
(d) Absence of double bond in ring A

xxx. In radioactive pharmaceuticals half-life of compound means
(a) The time taken for one half of the compound to find with serum albumin
(b) The time taken for onset of its action
(c) The time taken for the activity to decay to one half of its initial value
(d) The time taken for its complete metabolism

xxxi. Wagner's test is used to detect the presence of
(a) Steroids (b) Alkaloids
(c) Glycoside (d) Terpenes

xxxii. Metronidazole inhibits anaerobic bacteria and protozoa by
(a) Affecting the structure of DNA molecule of the organism
(b) Destroying the ribosome
(c) Inhibiting the cytochrome system
(d) Inhibiting the protein synthesis

xxxiii. Most common oestrogen progesterone preparation used as oral contraceptive agent contains
(a) Methanol + Progesterone
(b) Estrone + Progesterone
(c) Diethyl stilbestrol + Norgestrel
(d) Ethinyloestradiol + Norethindrone

xxxiv. Before washing the ampoules the mouth of each ampoule is rotated in Bunsen flame to melt down the rough edge. This process is called as
(a) Flaming (b) Charging
(c) Annealing (d) Grounding

xxxv. In Benzothiadiazides reduction of the double bond between the position 3 and 4 gives rise to compound with
(a) Decreased diuretic activity
(b) Increase the diuretic activity
(c) Ne diuretic activity
(d) No change in diuretic activity

xxxvi. Peripheral neurotransmitter is
(a) Histamine (b) Noradrenaline
(c) Hydroxytryptamine (d) Prostaglandin

xxxvii. Beer's law states that
(a) Absorbance of a solution is indirectly proportional to the absorbing solute
(b) Absorbance of a solution is indirectly proportional to the length of cell
(c) Absorbance of a solution is directly proportional to the absorbing solute
(d) Transmittance of a solution is directly proportional to the absorbance solvent

SECTION-II (MATCH THE FOLLOWING)

2. Match of the following

i. Given below are the hypertensive agents. Match their mode of action [P] to [T]

1. Minoxidil	[P] Alpha adrenoreceptor antagonist
2. Prazosin	[Q] Beta adrenoreceptor antagonist
3. Alpha methyldopa	[R] from alpha methyl norepinephrine
4. Clonidine	[S] Direct action on blood vessel (Vasodilation)
	[T] Decrease sympathetic activity through brain

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

ii. Indicate the from the group [P] to [T] the correct compound for the given source

1. Urginea maritima	[P] Camphene
2. Rheum palmatum	[Q] Scilliroside
3. Myristica fragrans	[R] Emodin
4. Claviceps purpurea	[S] Atropine
	[T] Ergometrine

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

iii. Select the appropriate p" range from [P] to [T] for the following indication

1. Methyl red	[P] 1.2-2.8
2. Bromothymol blue	[Q] 4.2-4.6
3. Phenolphthalein	[R] 4.8-5.2
4. Thymol blue	[S] 8.2-10.0
	[T] 6.0-7.6

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

iv. Given the drug and their schedule [P] to [T] Match the correctly

1. B-Complex tablets	[P] Schedule C,
2. Calcium gluconate injection	[Q] Schedule F
3. Small pox vaccine	[R] Schedule H
4. Ampicillin capsule	[S] Schedule L.
	[T] Schedule C

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

v. Given below the antibacterial agent and mode of action [F] to [T] Match the correctly

1. Gentamicin	[P] Inhibit the mycolic acid synthesis
2. Isoniazid	[Q] Prevent the bacterial cell wall synthesis
3. Polymyxin B	[R] Bind with 305 ribosomal subunit (take false amino acid)
4. Penicillin	[S] gets accumulated at cell wall membrane and counteract With Cell phospholipids
	[T] Destroys the nucleic acid

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

vi. Match the given ingredients from [P] to [T] with the purpose for which it is incorporated in the formulation of tablets

1. Glidant	[P] Pregelatinized starch
2. Diluent	[Q] Pyramine
3. Adherents	[R] Colloidal silica
4. Disintegrant	[S] Calcium sulphate
	[T] Sodium alginate

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

vii. Match the correct structural feature from [P] to [T] for the following compounds

1. Pempidine	[P] Imidazoline ring
2. Phentolamine	[Q] Piperidine ring
3. Prosympal	[R] Indene ring
4. Sulindac	[S] 1, 4-Dioxane ring
	[T] Indole ring

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

viii. Given below are the disease and the drugs used [P] to [T] Match them correctly

1. Parkinson's disease	[P] Probenecid
2. Glaucoma	[Q] Ampicillin
3. Gout	[R] Nitroglycerin
4. Angina	[S] Pilocarpine
	[T] Levodopa

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

ix. given below are the equipment used in manufacturing powder and their purpose [P] to [T] Match them correctly

1. Coulter counters	[P] to determine the total surface
2. Sorptometer	[Q] to determine particle size
3. Andreasen apparatus	[R] to determine the flow rate
4. Shear box	[S] to determine sedimentation rate
	[T] To determine the cohesiveness

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

x. Match the following from [P] to [S]

1. Photocell can be prevented from getting fatigue	[P] by selecting excitation and Visible
2. Resolving power of grating can be increasing	[Q] by increasing the Radiation for Minimal possible time
3. Two different colour compound can be analysed	[R] after separation using binary Component system
4. - max can be found	[S] by finding the absorbance at Each wavelength

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

xi. Choose the appropriate drug from [P] to [T] for the following categories

1. Alkylating agent	[P] Colchicine
2. Carcinogen	[Q] 6-Mercaptopurine
3. Antimitotic agent	[R] Cyclopentamine
4. Antimetabolite	[S] Thiotepa
	[T] Aflatoxin -B

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

xii. Choose the correct synonyms words [P] to [T] for the given type of stomata

1. Anomocytic	[P] Caryophyllaceous
2. Anisocytic	[Q] Rubiaceous
3. Diacytic	[R] Solanaceous
4. Paracytic	[S] Ranunculaceous
	[T] Cucurbitaceous

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

xiii. Given below are the drug and their antagonist [P] to [T]. Match them correctly

1. 5-HT	[P] Bemegride
2. Codeine	[Q] Atropine
3. Phenobarbitone	[R] Cyproheptadine
4. Muscarine	[S] Naloxone
	[T] Pyridoxine

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

xiv. Select the appropriate colour from [P] to [T] for the given wavelength

1. 450-480 nm	[P] Green
2. 500-560 nm	[Q] Yellow
3. 575-590 nm	[R] Blue
4. 675-750nm	[S] Orange
	[T] Red

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

xv. Match the solubility range from [P] to [T] as per I.P. with the following

1. Freely soluble	[P] Less than 1 part
2. Soluble	[Q] 1 to 10 part
3. Sparingly soluble	[R] 10 to 30 parts.
4. Very soluble	[S] 30 to 100 part
	[T] 100 to 1000 part

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

xvi. given below the drug and their enzyme [P] to [T] inhibited by them. Match the following

1. Physostigmine	[P] COMT
2. Imipramine	[Q] Acetaldehyde dehydrogenase
3. Pyrogallol	[R] Carbonic anhydrase
4. Disulfiram	[S] Cholinesterase
	[T] MAO

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

xvii. According to drug and cosmetics rule a list of schedule are as follows match the appropriate statement [P] to [T] with them

1. Schedule G	[P] Drugs used under medical supervision
2. Schedule P	[Q] Drug used only under medical supervision
3. Schedule J	[R] Minimum equipment needed for a retail pharmacy
4. Schedule N	[S] Diseases that a drug should not claim to cure
	[T] Life period of drugs

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

xviii. Given below are the drugs and their structural moiety [P] to [T] responsible for the biological action. Match them correctly.

1. Diphenhydramine	[P] Lactone ring
2. Acetylcholine	[Q] Substitution at C3 of barbituric acid
3. Penicillin G	[R] Onium group
4. Gardenal	[S] Beta-lactam ring
	[T] 2-Aminoethyl side chain

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

xix. Given below are the diuretic and their possible mode of action [P] to [T]. Match them correctly

1. Acetazolamide	[P] Affecting the osmosis
2. Furosemide	[Q] Inhibits the active transport of Cl at ascending loop of Henle
3. Triamterene	[R] Inhibits the reabsorption of Na mineralocorticoid Dependent portion of renal tubule in
4. Mannitol	[S] Carbonic anhydrase inhibitor
	[T] Causing acidosis

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

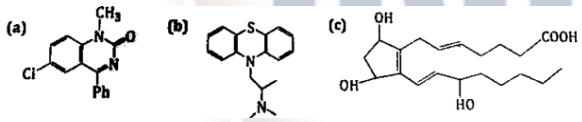
xx. Match the following

1. Vaccines	[P] Diphtheria antitoxin
2. Toxoids	[Q] Tetanus immunoglobulin
3. Human Immune sera	[R] Polio
4. Animal Immune sera	[S] Diphtheria

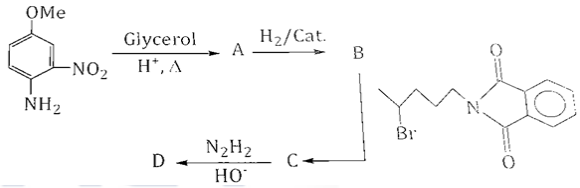
(a) 1-[R], 2-[S], 3-[P], 4-[Q]
(b) 1-[Q], 2-[S], 3-[P], 4-[R]
(c) 1-[S], 2-[R], 3-[P], 4-[Q]
(d) 1-[P], 2-[R], 3-[S], 4-[Q]

PART - B

3. How arachidonic acid is liberated endogenously? Name its major groups of active metabolites
4. Write briefly and precisely (in 2-3 lines each) one the following terms
   a. Chromophore b. Auxochrome c. R-bands
5. Name the precautions to be followed in the manufacture of radiopharmaceutical preparations
6. Described briefly (in about 10 lines) how absorbent cotton wool is prepared from comber waste
7. Give the composition of black fluid as per schedule O. How are they graded? What is their respective Rideal-Walker Coefficient?
8. Outline two step syntheses of aspirin from phenol, giving mechanism of each step.
9. Balance the following equations
   (a) $Cr_2O_7^{+2} + Fe^{+2} = Cr^{+++} + Fe^{+++}$
   (b) $MnO^-_4 + H_4C_2O_4 = Mn^{++} + CO_2$
   (c) $H_2O_2 + I^- = I_2 + H_2O$
10. Give reasons for using lycopodium as standards as quantitative microscopy. Write the formula.
11. Why water soluble ointment bases are in extensive use? Mention their specific properties
12. A prescription requires 500 ml of sodium chloride; it will contain 500 mEq of Na^+. How many gram of NaCI (MW = 58.5) are required
13. Name the three important metabolic processes for each of the following drugs



14. Give the most probable mechanism of action for each of the following (2-3 lines each)
   (a) Indomethacin (anti-inflammatory)
   (b) Warfarin (anticoagulant)
   (c) Verapamil (antiarrhythmic)
15. (a) Calculate the approximate molarity of conc. HCI (Density of conc. HCl = 1.19, conc. HCI has a concentration of about 38% by weight)
   (b) Convert the given values of hydronium ion concentration to pH
   (i) (H) = 4.5 x 105 N
   (ii) (H_2) =0.00143 N
16. What do you understand from "Static Test on prepared tablets" Explain Briefly?
17. Write therapeutic uses of Caffeine, Theophylline and Theobromine. How do they differ in their action on CNS diuresis and respiration?
18. What is the bioavailability of drug? Mention the parameters important in evaluating the bioavailability of drugs
19. Give the principle involved in the official assay of Sulfadimidine and Vit. C.
20. Synthesis of primaquine is outline below. Give the structures of A-D Mention the names of the reactions involved in this synthesis



21. What are prodrugs? Mention their usefulness
22. Write briefly on the role of plasticizers in capsule
23. How will you avoid 'Caramelisation' in the preparation of injection? What is 'Leaker Test'?
24. How the entry of drugs molecule into the CNS is controlled? What are the other biological varriers?
25. How does the Blister package protect the content from moisture?
26. Given below are some absorption frequencies in an IR spectrum. Indicate the appropriate functional group for the same
   (a) 3500-330 cm^{31}
   (b) 3030-3010 cm
   (c) 1750 cm^1
27. Give only names of the enzymes involved in the biosynthesis of epinephrine form tyrosine

Answer Key

PART (SECTION - I)

i - c	ii - d	iii - b	iv - b	v - d	vi - c	vii - b	viii - c	ix - b	x - a
xi - c	xii - b	xiii - b	xiv - a	xv - c	xvi - c	xvii - d	xviii - b	xix - b	xx - d
xxi - a	xxii - d	xxiii - c	xxiv - b	xxv - c	xxvi - d	xxvii - a	xxviii - a	xxix - b	xxx- c
xxxi - b	xxxii - a	xxxiii - b	xxxiv - c	xxxv - b	xxxvi - b	xxxvii- c			

PART (SECTION - II)

i - b	ii - a	iii - d	iv - b	v - a	vi - a	vii - c	viii - c	ix - d	x - b
xi - a	xii - c	xiii - d	xiv - c	xv - b	xvi - b	xvii - d	xviii - b	xix - a	xx - a

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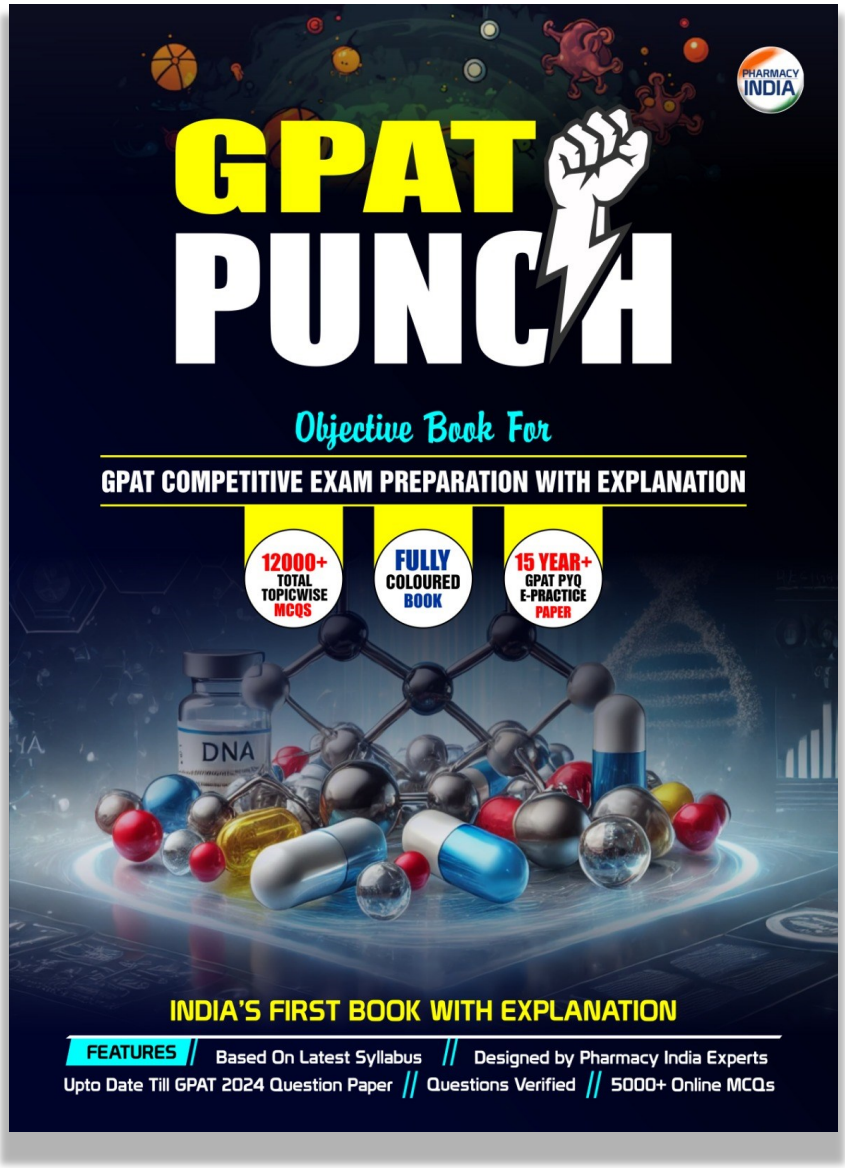

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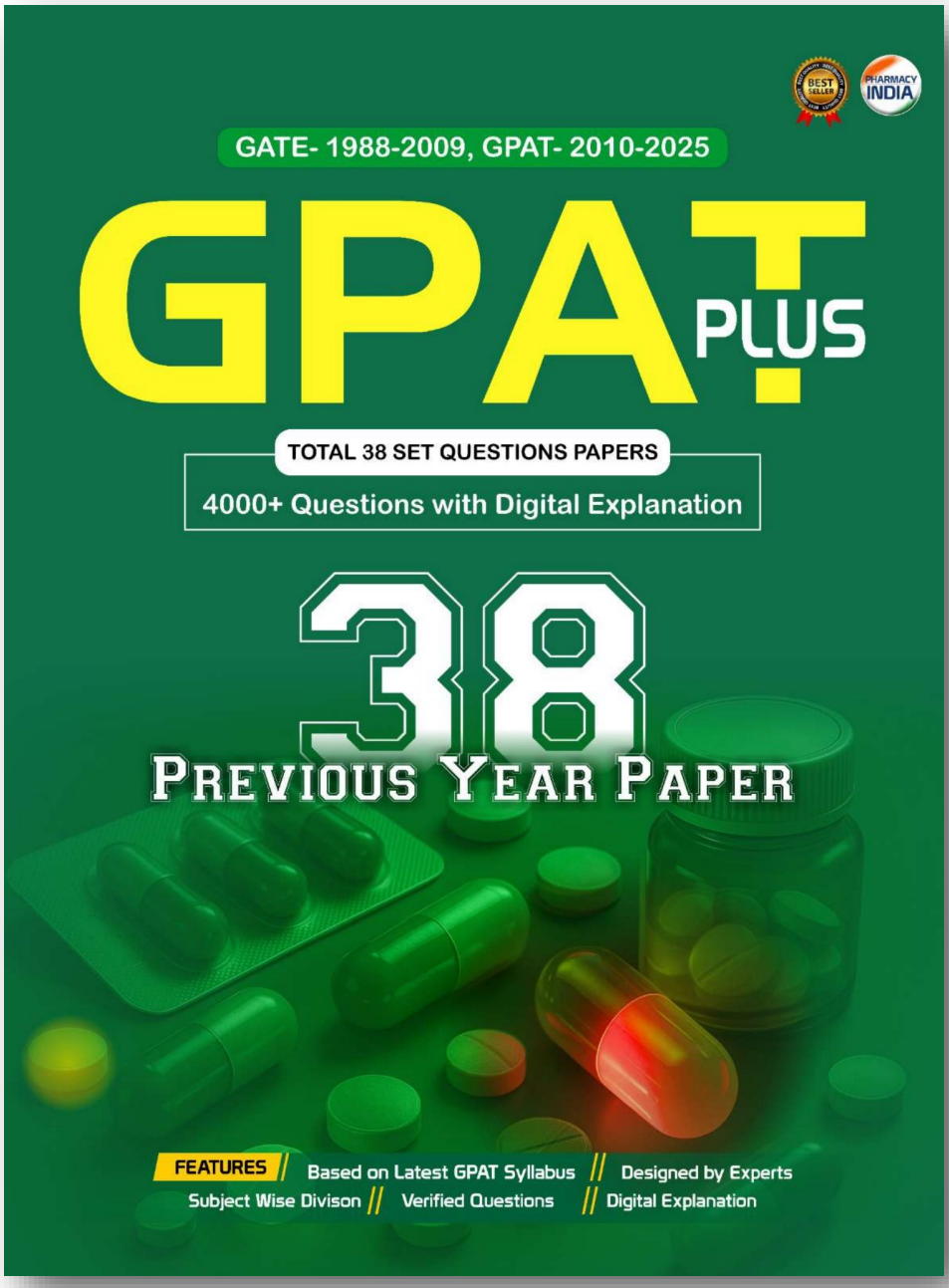

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