GATE-1989

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

1. Multiple choice question

i. Repeated administration of Tyramine results in its decreasing effectiveness
(a) Gets detoxicated easily
(b) Displaces Nor-adrenaline from nerve ending binding site
(c) Displaces Adrenaline from nerve ending binding site
(d) None of the above

ii. Atropine on hydrolysis with Barium hydroxide gives
(a) Tropanol and Tropic acıd
(b) Scopine and Tropic acid
(c) Ecgonine and Benzoic acid
(d) Benzyi Ecgonine and Methanol

iii. The concentration of sucrose in simple Syrup BP is
(a) 85% w/w (b) 60.70% w/w
(c) 66.70% w/w (d) 40.74% w/w

iv. Stratified cork and forked are the characteristic diagnostic features of
(a) Apocynaceae (b) Scrophulariaceae
(c) Gentianaceae (d) Polygonaceae

v. Most accepted mechanism for developing bacterial resistance to Sulphonamides is
(a) An increasing capacity to inactivate or destroy the drug
(b) An alternative metabolic pathway for synthesis of an essential metabolite
(c) An increasing product of drug antagonist
(d) An alternation in enzyme that utilize PABA

vi. C_{17} α-ß unsaturated lactone ring is a common feature in
(a) Digitalis and Squill glycosides
(b) Digitalis and Strophanthus glycosides
(c) Digitalis and Senna glycosides
(d) Digitalis and Amygdalin

vii. For drying blood plasma the following technique is used
(a) Spray drying (b) Freeze drying
(c) Vacuum drying (d) Fluid bed drying

viii. C_3 O-glycoside Digitoxin is used for
(a) Cardiac action
(b) Hypotensive action
(c) Precipitating steroids from solution
(d) Precipitating Anthraquinone glycosides

ix. Chemical name of Amoxicillin is
(a) 6- [D-(-) α-amino p-hydroxy phenyl acetamido]penicillanic acid
(b) 4- [D-(-) α-amino p-hydroxy phenyl acetamido] penicillanic acid
(c) ß - hydroxy analogue of Benzyl penicillin
(d) α - Carboxy benzyl penicillin

x. The HLB value of sodium lauryl sulphate is
(a) 6.5 (b) 13.8 (c) 25.0 (d) 40.0

xi. Claviceps purpurea yields after infecting ovaries of Graminaceous plants
(a) Digitoxın (b) Lysergic acid derivatives
(c) Reserpine (d) Polypeptides

xii. In the official bioassay of Erythromycin strain used is
(a) Bacillus subtilis (b) Micrococcus luteus
(c) Salmonella typhi (d) Escherichia coli

xiii. The disintegration time for sugar coated tablet is
(a) 30 minutes (b) 45 minutes
(c) 60 minutes (d) 75 minutes

xiv. Idioblasts of crystal layer of calcium oxalate is a diagnostic feature of
(a) Hyoscyamus Niger leaves
(b) Deadly nightshade leaves
(c) Cinchona bark
(d) Senna leaves

xv. Antibiotic which interacts with calcium ion is
(a) Erythromycin (b) Streptomycin
(c) Tetracycline (d) Ampicillin

xvi. Flow rate of granules from the hopper can be improved by adding
(a) Disintegrant (b) Glidant
(c) Binder (d) Lubricant

xvii. Silicon carbide rod heated to a high temperature is used as a
(a) Detector in infra-red spectroscope
(b) Source of light in infra-red spectroscope
(c) Source of light fluorimetry
(d) Detector in gas chromatography

xviii. Anomocytic type stomata are found in the leaves of
(a) Fox glove (b) Urginea maritima
(c) Cassia acutifolia (d) Atropa belladonna

xix. Liver microsomal enzymes are stimulated (enzymatic induction) by
(a) Cimetidine (b) Phenobarbitone
(c) Procaine (d) Adrenaline

xx. Enteric coating is achieved by using
(a) Hydroxy propyl methyl cellulose
(b) Carboxy methyl cellulose
(c) Cellulose acetate Phthalate
(d) Povidone

xxi. Carr's price reaction is applied for the photometric evaluation of
(a) Vitamin A
(b) Tocopherol
(c) Nandrolone Phenyl Propionate
(d) Benzodiazepine

xxii. Peroxide enzyme present in acacia is identified by
(a) Borntragers test
(b) Molisch's test
(c) Oxidation and extraction in Benzene
(d) Oxidation and treatment with Benzidine

xxiii. Prostaglandins are a group of related
(a) Alcohols (b) Aldehydes
(c) Fatty acid (d) Alkaloids

xxiv. Licence to sell drug specified in schedule C and C, is given from number
(a) 19 (b) 18 (c) 21 (d) 24

xxv. Liquid paraffin exhibits
(a) Plastic flow (b) Newtonian flow
(c) Pseudoplastic flow (d) Dilatant flow

xxvi. Estrogenic and Progestogenic combination mainly
(a) Inhibits the ovulation
(b) Inhibits the implantation of the fertilized ovum
(C) Inhibits the fertilization of ovum
(d) Inhibits development of endometrium

xxvii. More of earthy matter in a Rhizome is determined by
(a) Total ash vale
(b) The earthy material is separated and then weighed
(c) The Rhizome is washed in water and the in hydrochioric acid finally it is weighed
(d) Acid insoluble ash value

xxviii. Lidocaine is synthesized from
(a) 2, 6-dimethyl-5-amino methyl benzene
(b) 2, 6-dimethyl-5-nitro methyl benzene
(c) 2, 6-xylidine
(d) 2, methyl-6-ethyl-5-amino methyl benzene

xxix. Sterilization temperature for aqueous solution in autoclave (Moist heat) is
(a) 72°C (b) 121°C (c) 147°C (d) 160°C

xxx. Following combination is suggested in the treatment of Leprosy
(a) Dapsone + Ampicillin Clofazimine
(b) Dapsone + Clofazimine Rifampin
(c) Dapsone + Erythromycin Rifampin
(d) Dapsone + Tetracycline Streptomycin

xxxi. The gummy nature Astragalus gummifer is depend on
(a) More of Methoxy group of Bassorin
(b) The carbohydrate content
(c) More of hydroxyl groups of the sugar moiety
(d) More of protein content of the drug

xxxii. The vitamin administered with Isoniazid to minimize its adverse reaction is
(a) Vitamin A (b) Pyridoxine
(c) Biotin (d) Pantothenic acid

xxxiii. For the synthesis of Nitrofurantoin which one of the following combination of chemicals are used
(a) 5-Nitro 2-furaldehyde and 2-amino hydantoin
(b) 5-Nitro 2-furaldehyde and hydantoin
(c) 5-amino 2-furaldehyde and 2-amino hydantoin
(d) 5-Nitro 2-furaldehyde and barbituric acid

xxxiv. To get the optimum optical density of the solution for 1 cm thick layer the concentration should be about
(a) 10^{-4} mole/lit (b) 10^{-7} mole/lit
(c) 0.1 gm/lit (d) 0.5 gm/lit

xxxv. The sugar moiety of Digitalis purpurea is
(a) 2, 6-deoxy allose (b) 2, 6-deoxy glucose
(c) 2. 6-deoxy Rhamnose (d) 2, 6-deoxy galactose

xxxvi. Addition of sodium chloride to sodium oleate emulsion will
(a) Stabilize emulsion
(b) Destabilize emulsion
(c) Decrease the globule size of the emulsion
(d) None of these

xxxvii. Antihypertensive drug inhibits the renin angiotensin system is
(a) Reserpine (b) Captopril
(c) Methyldopa (d) Propranolol

xxxviii. Acidity of Ascorbic acid is due to the presence of
(a) Free carboxylic acid
(b) A number of hydroxyl groups
(c) Enolic groups
(d) None of these

xxxix. Progesterone injection BP is a sterile solution in
(a) Water (b) Ethyl oleate
(c) Propylene glycol (d) Glycerol

xxxxl. Thiamine on treatment with sodium sulfite solution and sulfur dioxide yields
(a) Pyrimidine and a thiazole derivative
(b) Pyridine and thiazole derivative
(c) 2, 3, 4-trihydropyridine and thiophene derivatives
(d) Pyrimidine and thiophene derivatives

SECTION-II (Match The Following)

2. Multiple choice question

i. Identify the correct skeleton ring present in the following compounds from the ring system listed from [P] to [T]

1. Riboflavin	**[P]** Perhydro cyclopentano phenanthrene
2. Estrone	**[Q]** 1, 8 Naphthyridine
3. Indomethacin	**[R]** Indole
4. Nalidixic acid	**[S]** Quinolin
	[T] Isoalloxazine

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

ii. Choose the instrument or apparatus listed from [P] to [T] study the following

1. Rheology of semi solids	**[P]** Andreasen Pipette
2. Hardness of tablets	**[Q]** Monsanto tester
3. Particle size in suspension	**[R]** Ultrasonifier
4. Homogenization of emulsion	**[S]** Viscometer
	[T] Zeta meter

(a) 1-[S], 2-[Q], 3-[R], 4-[P]
(b) 1-[S], 2-[Q], 3-[P], 4-[R]
(c) 1-[S], 2-[R], 3-[P], 4-[Q]
(d) 1-[R], 2-[Q], 3-[5], 4-[P]

iii. Given below are some microscopical diagnostic of the drug listed in [P] to [T]. Choose the appropriate one

1. Unlignified septate fiber	[P] Rhubarb
2. Raphides of calcium oxalate embedded in mucilage	[Q] Liquorice
3. Anisocytic type of stomats	[R] Ginger
4. Star spots	[S] Squill
	[T] Solanaceous plants

(a) 1-[P], 2-[Q], 3-[R], 4-[S]
(b) 1-[S], 2-[R], 3-[Q], 4-[P]
(c) 1-[Q], 2-[R], 3-[P], 4-[S]
(d) 1-[R], 2-[5], 3-[T], 4-[P]

iv. Chosse the most appropriate drug for the following

1. Potassium-sparing diuretic	[P] Spironolactone
2. Loop diuretic	[Q] Mannitol
3. Osmotic diuretic	[R] Furosemide
4. Carbonic anhydrase inhibitor	[S] Acetazolamide
	[T] Aldosterone

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

v. Transmitted colour corresponds to various wave length ranges as listed under [P] to [T]. Choose the correct wavelength for the colour

1. Green	[P] 435-480
2. Orange	[Q] 500-560
3. Yellow	[R] 580-595
4. Red	[S] 595-650
	[T] 650-780

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

vi. Given below equipment used in the manufacture of the following product [P] to [T]. Match them correctly

1. Zanasi	[P] Tablet granules
2. HEPA filter	[Q] Tablet coating
3. Chilsonator	[R] Emulsion
4. Accela cota	[S] Injectable
	[T] Capsules

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

vii. Match the following with the schedules listed in [P] to [T] correctly

1. Requirements of factory premises	[P] P
2. Standards for disinfectant fluids	[Q] V
3. Life period of drugs	[M] N
4. List of minimum equipment for The effficient running of Pharmacy	[O]
	[T] M

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

viii. Following are the reaction/tests observed in case of drugs listed in [P] [T]. Match them correctly

1. When fixed oil is exposed to UV rays, Blue fluorescence is produced	[P] Digoxin
2. On oxidation with KMnO4 Benzaldehyde Odour is perceived	[Q] Benzoin
3. with ammoniacal Quaxom characteristic Ballooned fibre is seen under microscope	[R] Cinchona
4. Bark powder exhibits fluorescence with Sulphuric acid	[S] Palmolein
	[T] Gossypium barbadance

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

ix. Mechanism of Antitubercular action of the drug listed are indicate are in [P] to [T]. Choose the most appropriate one

1. Ethambutoil	[P] Prevents the synthesis of protein and DNA and Reduces RNA synthesis
2. PA. S.	[Q] Interferes with several of protein synthesis
3. Cycloserine	[R] Competitive inhibition
4. Ethionamide	[S] Inhibits peptide synthesis in Mycobacteria
	[T] Inhibits DNA directed RNA Synthesis

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

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

1. Histamine H_2 receptor	[P] Atropine
2. Muscarinic receptor	[Q] Ranitidine
3. Adrenaline a receptor	[R] Phentolamine
4. Adrenaline ß receptor	[S] Metaraminol
	[T] Metoprolol

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

xi. Match the following regions in GIT with the p" levels indicated from [P] to [T]

1. Mouth	[P] 5.0-6.0
2. Stomach	[Q] 6.8-7.5
3. Duodenum	[R] 4.0-7.0
4. large intestine	[S] 3.0-5.0
	[T] 1.5-4.0

(a) 1-[P], 2-[S], 3-[Q], 4-[R]
(b) 1-[P], 2-[S], 3-[Q], 4-[R]
(c) 1-[Q], 2-[T], 3-[S], 4-[R]
(d) 1-[R], 2-[Q], 3-[5], 4-[P]

xii. Listed in [P] to [T]are some of the analytical constants. Match them correctly with the drugs given below

1. A Leafy drug	[P] Total ash value
2. A Bark	[Q] Cineole content
3. Eucalyptus oil	[R] Fibre length
4. A fixed oil having more of unsaturated fatty acid glycerides	[S] Iodine value
	[T] Stomatal index

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

xiii. Match the ingredients listed [P] to [T] with the purpose for which they are used in the formulations

1. Film coating	[P] Sodium benzoate
2. Syrups	[Q] Ethyl cellulose
3. Emulsification	[R] Eudragit
4. Enteric coating	[S] Sucrose
	[T] Sodium oleate

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

xiv. Match the biological listed under [P] to [T] for the following compounds

1. 1, 3-Propanediol, 2-methyl 2-propyl Carbamate	[P] Antimalarial
2. 2 Chloro-10[3-(dimethylamino) propyl] Phenothiazine	[Q] Bactericidal to anaerobic and Microaerophilic organisms
3. 5 Nitro-2-furaldeyde semicarbazone	[R] Antibacterial
4. 2 Methyl-5-Nitro Imidazole-ethanol	[S] Relief of anxiety and tension
	[T] Tranquilizer

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

xv. Given below are the drug [P] to [T] and the ailments for which they are recommended. Match them correctly

1. Parkinsonism	[P] Methyldopa
2. Hypertension	[Q] Levodopa with decarboxylase inhibitor
3. Nasal congestion	[R] Neostigmine
4. Myasthenia gravis	[S] Phenyl Propanolamine
	[T] Ibuprofen

(a) 1-[P], 2-[Q], 3-[R], 4-[S]
(b) 1-[Q], 2-[P], 3-[S], 4-[R]
(c) 1-[Q], 2-[R], 3-[P], 4-[S]
(d) 1-[R], 2-[Q], 3-[5], 4-[P]

xvi. Given below are some of the drugs and their mode action in [P] to [T]. Match them correctly

1. Hydralazine	[P] Vasodilator by direct action
2. Phenothiazine	[Q] Inhibits the Vasoconstrictor and pressor effect of 5 HT
3. Methysergide	[R] Antagonist HT receptor of histamine
4. Tolazamide	[S] Stimulate the islet tissue to secrete insulin
	[T] Inhibiting the enzyme carbonic anhydrase

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

xvii. Given below in [P] to [T] are the names of drugs, appropriate tests are given below for drugs. Match them correctly

1. Alcoholic solution of α-naphthol and Sulphuric acid	[P] Atropine
2. Murexide test	[Q] Reserpine
3. Para-dimethylamino Benzaldehyde	[R] Caffeine
4. Ninhydrin	[S] Gelatin
	[T] Triticum sativum powder

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

xviii. Given below in [P] to [T] are the names of instruments used for the determination of the following. Match them correctly

1. Particle volume	[P] Clarity apparatus
2. Presence of foreign particle	[Q] DuNouy ring
3. Surface tension	[R] Coulter counters
4. Presence of polymorph	[S] Compactor
	[T] Differential thermal calorimeter

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

xix. Choose the correct starting material listed from [P] to [T] for the synthesis of the following drugs

1. Cortisone	[P] Diosgenin
2. Progesterone	[Q] β-ionone
3. Testosterone	[R] Spirostanol
4. Vitamin A	[S] Sarmentogenin
	[T] Anthracin

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

xx. Given below are the types of ointment bases. Match them with the correct ointments in [P] to [T]

1. Absorption base	[P] Emulsifying ointment
2. Oleaginous base	[Q] Hydrophilic ointment
3. Emulsion base	[R] Oily cream
4. Water soluble base	[S] Kaolin poultice
	[T] Simple ointment

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

PART - B

3. **Write the structure of the following; indicating to what pharmacological category, they belong**
(a) 1-dimethylamino-3-(4-Chlorophenyi 3, 2-Pyridyl) Propane
(b) 2-hydroxy methylene-17 ß hydroxy-17-methyl 5 α-androstan 3-one
(c) 2, 4-diamino-5-(3, 4, 5-trimethoxy phenyl) methyl pyridine

4. **(a) What is a barrier-layer cell?**
(b) What are the different ways by which a molecule can absorb energy?

5. **Explain briefly the improved artificial method for producing Sclerotium.**

6. **Give the characteristics of the ideal preservative for Pharmaceutical preparation.**

7. **Give the principle of official assay of INH. Given equation for the reactions involved.**

8. **Give the exact mode action of the following drugs:**
(a) Dicoumarol (b) Vinblastine (c) Valproic acid

9. **Give the mode of action of the following anti arrhythmic drugs:**
(a) Procainamide (b) Propranolol (c) Verapamil

10. **Mention the various factors governing transdermal absorption of drugs.**

11. **(a) What is Hoffmann's exhaustive Methylation?**
(b) Show the complete step of reactions when Isoquinoline is subjected to Hoffmann's Exhaustive Metnylution.

12. **How the solid samples are prepared for the measurement of IR Absorption spectra? Why such a process is adopted**

13. **Name the various Insulin injections which are official in IP Mention time onset and duration of action**

14. **Give the names of the drugs, their source And one chemical test for identification of any one important constituent in each of the following**
(a) Drug obtained as latex after incisions on capsule
(b) Dried juice obtained from the leaves of plant belonging to Liliaceae family
(c) A seed having action on heart

15. **Enumerate the problems associated with use of plastic as a material for packaging Pharmaceuticals**

16. **With the help of IR absorption readings how you can distinguish the following pairs of compounds. Predict the hands and interpret**

17. **Define the following**
(a) Liposome (b) Polymorphism (c) Prodrug

18. **Name the various methods in the preparation of micro capsules and give only the process involved in the Coacervation phase separation technique**

19. **Give the mode of action of following antibiotics**
(a) Ampicillin (b) Tetracycline (c) Erythromycin

20. **What are the possible adulterants of foxglove leaves? How are they detected?**

21. **List the physicochemical factors affecting drug absorption**

22. **Write the equation for the following synthesis**
O-Chlorobenzoic acid is condensed with 2, 3 Xylidine with the aid of Potassium carbonate and the resulting Potassium salt is treats with mineral acid

23. **Give the possible Drug/Drug interaction of the following combination**
(a) Penicillin with Probenecid
(b) Lithium carbonate with Chlorothiazide
(c) Levodopa with Pyridoxine

24. **(a) what concentration of Dextrose will be used for the preparation of 100ml of Dextrose solution isotonic with blood serum.**
Molecular weight of Dextrose = 180
(b) In what proportion 80% and 30% alcohol mixed to obtain 50% alcohol

25. **Give the structure and specification relationship in the following compounds**
(a) Phenobarbital (b) Amobarbital
(c) Cyclobarbital (d) Pentobarbital

26. **(a) an alkaloid gave E^1, at 310 nm = 180. The Extinction of 0.003% solution in water at 310 nm was found 0.500 (1 cm cell). Calculate the percentage of alkaloid**
(b) Find the HLB value of a center which has saponification number 40.5 and acid number of the fatty acid 260.0

27. **Name the endogenous neurohormones and give their structure.**

Answer Key

PART (SECTION - I)

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

PART (SECTION - II)

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

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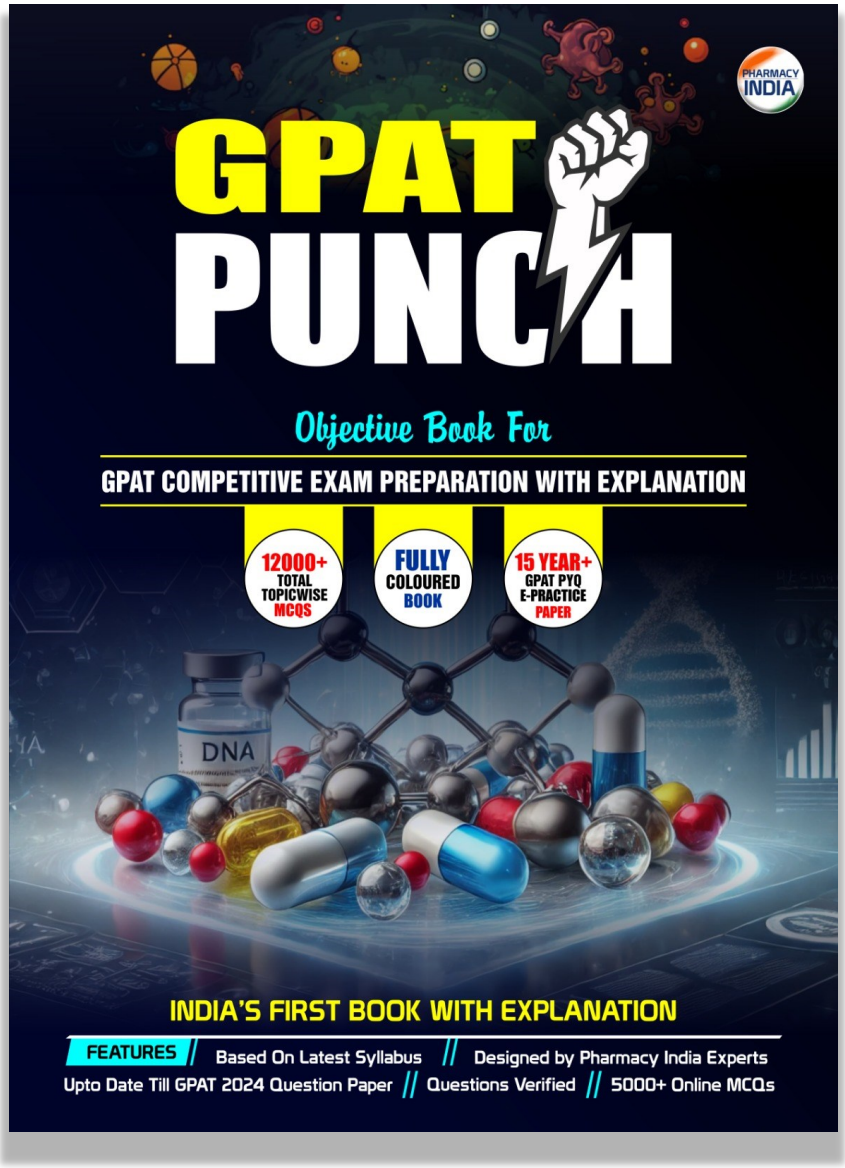

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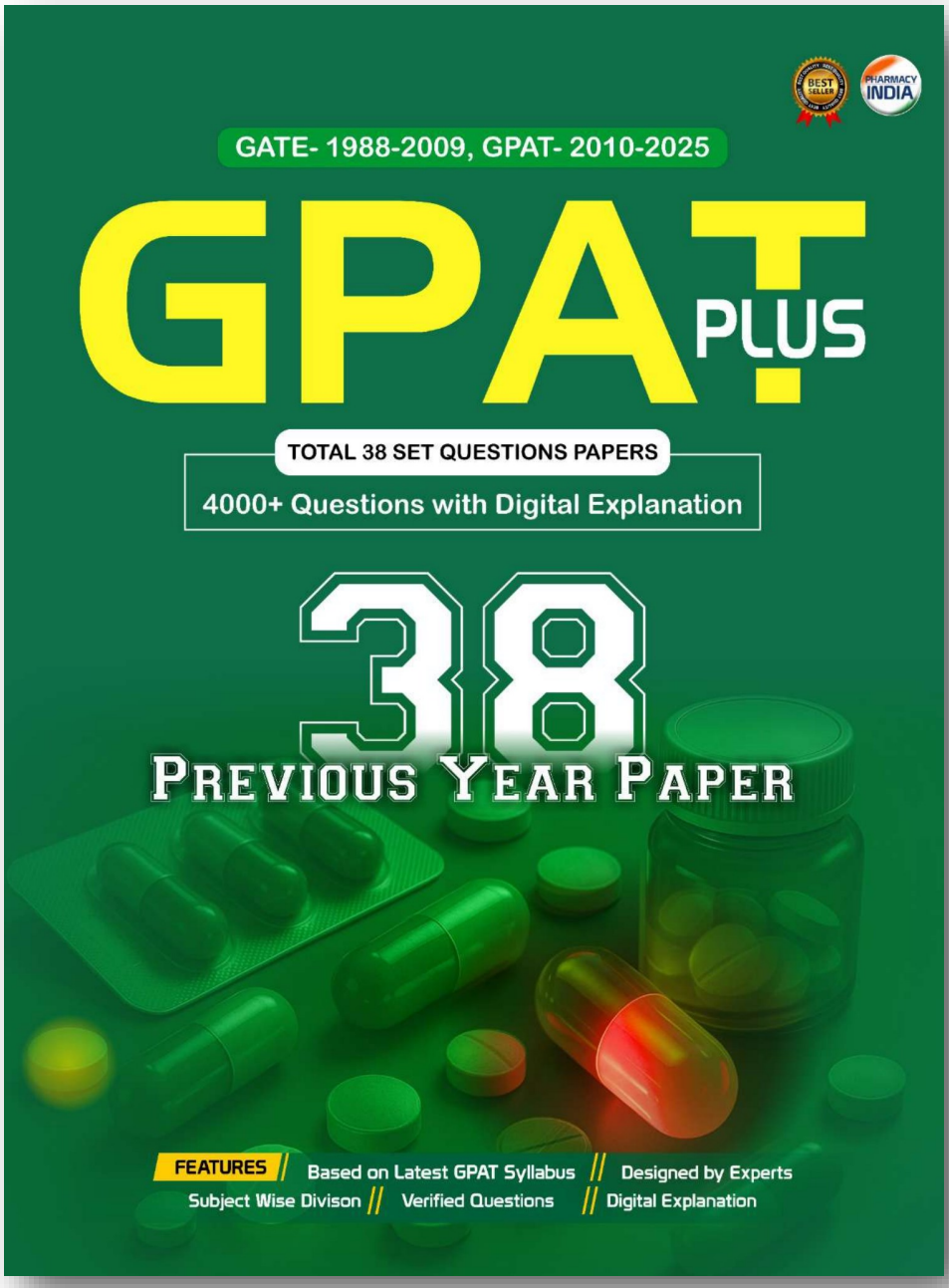

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