Q. No. 1 – 20 Carry One Mark Each

1. Different species of Ephedra can be identified by observing the nature of
   (A) inner surface (B) outer surface (C) trichomes (D) scaly leaves

2. Indian Rhubarb can be distinguished from Rhapontic Rhubarb by the fluorescene it emits under UV light. Indian Rhubarb gives
   (A) deep yellow (B) deep violet (C) orange (D) pale green

3. Genetically modified species of Papaver namely Papaver bracteatum and Papaver orientale contain the predominant alkaloid
   (A) Morphine (B) Codeine (C) Thebaine (D) Narcotine

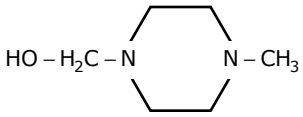
4. Increased risk of atherosclerosis is associated with decreased serum levels of
   (A) LDL (B) HDL (C) Triglycerides (D) VLDL

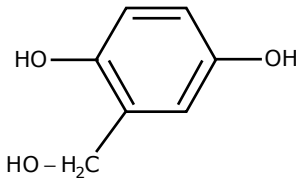
5. A peptide hormone which inhibits bone resorption and given as a nasal spray is
   (A) Cortisol (B) Alendronate (C) Calcitonin (D) Calcitriol

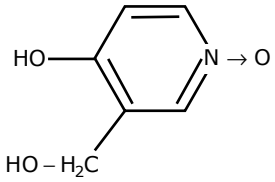
6. An inorganic ion which is used prophylactically in bipolar depression is
   (A) Valproate (B) Lithium (C) Chromium (D) Valium

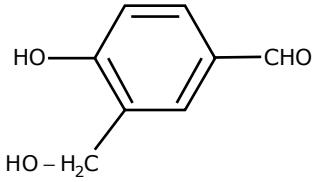
7. A β-lactamase inhibitor which contains an 1-oxopenam structure is
   (A) Tazobactam sodium (B) Clavulanate potassium
   (C) Sulbactam sodium (D) Thienamycin

8. Salbutamol is prepared from

(A) 

(B) 

(C) 

(D) 

9. Antihypoprothrombinemic effect of one stereochemical form is two to five more than others

(A) (S)-(+)- Warfarin (B) R-(+)- Warfarin

(C) (S)-(-)- Warfarin (D) (RS)- Warfarin

10. Some of the organic reactions are catalysed by a product obtained from starch on treatment with amylase from Bacillus macerans. It is

(A) Amylopectin (B) Amylose (C) Cellulose (D) Cyclodextrin

11. Florentine receiver is used to separate the liquids based on

(A) molecular weight (B) sedimentation rate

(C) density (D) freezing point

12. The official dissolution test apparatus contains cylindrical vessel and the lower edge of the blade is positioned from inside bottom of the vessel at

(A) 18 to 22mm (B) 23 to 27mm (C) 20 to 24mm (D) 25 to 29mm

13. As per Drugs and Cosmetics Act and Rules, the Good Manufacturing Practice is included under Schedule

(A) W (B) P (C) S (D) M

14. A substance used for modification of silica gel for reversed-phase TLC is

(A) Benzene (B) Glycerine (C) Silicone oil (D) Ether

15. In IR spectrum, the functional group region is from

(A) $4000cm^{-1}$ to $900cm^{-1}$ (B) $4000cm^{-1}$ to $1400cm^{-1}$

(C) $1400cm^{-1}$ to $900cm^{-1}$ (D) $4000cm^{-1}$ to $660cm^{-1}$

16. The equation $E = E^{o} + \frac{RT}{nF} \ln a_{M^{n+}}$ is used to measure the

(A) Conductance (B) Potential difference

(C) Resistance (D) Current

17. Intermediates in the biosynthesis of cholesterol are

(A) Mevalonic acid and isopentenyl pyrophosphate

(B) Mevalonic acid and aldosterone

(C) Isoprenaline and aldosterone

(D) Isoprenaline and isopentenyl phosphate

18. A naturally occurring amino acid which does not have a chiral centre is

(A) Glycine (B) Alanine (C) Tryptophan (D) Tyrosine

19. A given Gram-positive bacterium is differentiated from Gram-negative bacteria by Gram staining. This is because its cell wall contains

(A) Lysozyme (B) Teichoic acid

(C) Membrane proteins (D) Lipid A

20. The drug which increases the plasma concentration of digoxin by a pharmacokinetic mechanism is

(A) Lidocaine (B) Captopril

(C) Quinidine (D) hydrochlorthiazide

Q. No. 21 – 56 Carry Two Marks Each

21. Microscopic characters of ginger rhizome are

(A) Spindle shaped lignified fibres and sclereids

(B) Cluster crystals of calcium oxalate and sclereids

(C) Non-lignified vessels and sac shaped starch grains

(D) Non-lignified fibres and sclereids

22. Klunge's test is for the identification of

(A) Barbaloin (B) Isobarbaloin (C) Aloinosides (D) Aloesin

23. 3, 4 Benzpyrene present in cigarette smoke reduces the therapeutic activity of diazepam by

(A) Altering excretion

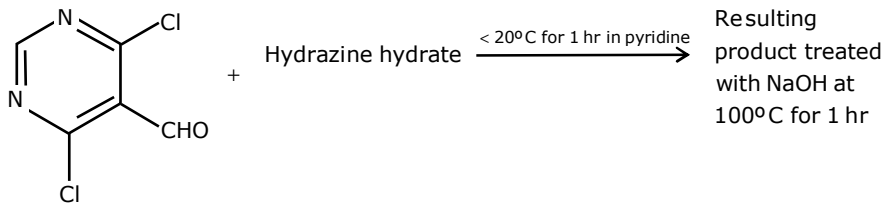
(B) Binding to plasma proteins

(C) Inhibiting metabolism

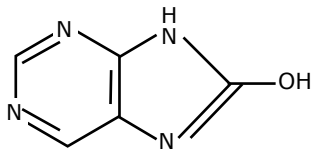
(D) Increasing the activity of liver microsomal enzymes

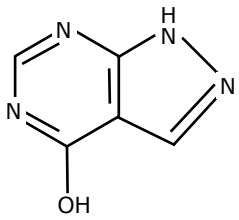
24. An NMDA antagonist introduced for treatment of Alzheimer's disease is

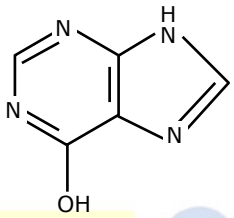
(A) Dopamine (B) Nor-epinephrine (C) Serotonin (D) Memantine

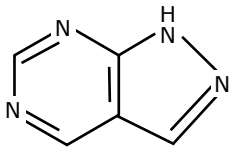
25. 

gave an effective product for the treatment of Gout. Identify

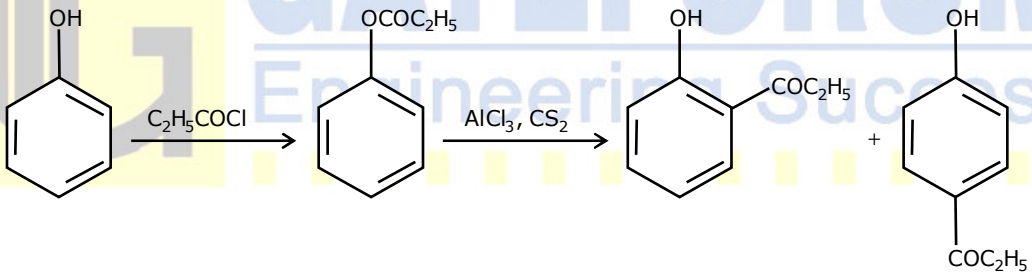
(A) 

(B) 

(C) 

(D) 

26. Phenol, an antiseptic when treated as follows



gave the above two phenolic ketones. The reaction is

(A) Hofmann rearrangement
(B) Fries rearrangement
(C) Kolbe's reaction
(D) Reimer-Tiemann reaction

27. The quantity of drug required to make a 2% w/w solution in 240ml of alcohol is (The density of alcohol is 0.816 g/ml)

(A) 1.632g (B) 2.400g (C) 4.000g (D) 4.800g

28. In multistation punching machine, the upper as well as lower punches are connected by

(A) Cams
(B) Turrets
(C) Wire meshes
(D) Revolving belts

29. As per the Drugs and Cosmetics Act, the HEPA filters are required to filter t in the pharmaceutical manufacturing unit. Grade A filter is used for
(A) Aseptic preparation and filling
(B) Background room used for preliminary activities
(C) Filtering liquid preparations
(D) Handling of components after washing

30. The deflection of positive ions formed in a mass spectrometer by electric and magnetic fields depends upon its
(A) mass
(B) charge
(C) velocity
(D) mass, charge and velocity

31. Cyclohexane can be used as a solvent in UV spectrophotometric analysis because
(A) It has a ring structure
(B) Energy requirement for $\sigma - \sigma^*$ is in the range of 120-200nm
(C) It is volatile
(D) It is immiscible with water

32. Quaternary structure in protein molecules refers to the
(A) Arrangement of multiple domains in a single polypeptide chain
(B) Specific arrangement of multiple subunits in multi-subunit proteins
(C) Formation of molten globules
(D) Protein folding in single subunit proteins

33. Interleukins are
(A) Polypeptide cytokines important in the inflammatory cascade
(B) Prostaglandins that account for gastrointestinal disorders
(C) Enkephalins which are specific for asthma
(D) Dipeptides which have antimicrobial properties

34. Phase I clinical studies of a drug under development is generally carried out on
(A) At least 10,000 people from different ethnic communities and a wide range of age groups
(B) A medium sized group of 500-1000 patients suffering from the disease for which the drug is being developed
(C) A small group of 20-100 healthy male and female volunteers
(D) Reliable in-vintro cell-lines derived from people suffering with the disease

35. A young patient complains that he gets severe shortness of breath whenever he takes aspirin for headache. Increased levels of a substance responsible for aspirin hypersensitivity is
(A) Prednisone
(B) Prostacycline
(C) Ibuprofen
(D) Leukotriene LTC_4

36 to 50 are Matching exercises. Match group I with Group II identify the correct combinations

36.

Group I		**Group II**	
	Glycoside		**Type**
P.	Gentisin	1.	Flavonol
Q.	Genistein	2.	Flavone
R.	Apigenin	3.	Xanthone
S.	Quercetin	4.	Isoflavone

(A) P-4,Q-3,R-1,S-2 (B) P-1,Q-2,R-4,S-3

(C) P-3,Q-4,R-2,S-1 (D) P-2,Q-1,R-3,S-4

37.

Group I		**Group II**	
	Bark		**Diagnostic Microscopical Characters**
P.	Kurchi	1.	Heavily lignified phloem fibres with Y-shaped pits, secretory canals, microcrystals of calcium oxalate
Q.	Cascara	2.	Pericycle with stone cells having horse-shoe Shaped thickening, oil cells, minute needles of calcium oxalate
R.	Cinnamon	3.	Alternating layers of stone cells and phloem, non-lignified pericyclic fibres, prismatic crystals of calcium oxalate
S.	Cinchona	4.	Wavy medullary rays, groups of heavily lignified sclereids, crystal sheath of calcium oxalate

(A) P-2,Q-1,R-4,S-3 (B) P-4,Q-3,R-1,S-2

(C) P-3,Q-4,R-2,S-1 (D) P-1,Q-2,R-3,S-4

38.

Group I		**Group II**	
	Drug		**Mechanism of action is by inhibition of**
P.	Levofloxacin	1.	DNA dependent RNA polymerase
Q.	Caspofungin	2.	Topoisomerase II (DNA gyrase) the enzyme that produces a negative supercoil
R.	Aztreonam	3.	The synthesis of β(1-2) glycan
S.	Rifabutin	4.	Cell wall synthesis preferentially binding to a specific penicillin binding protein

(A) P-2,Q-3,R-4,S-1 (B) P-3,Q-4,R-1,S-2

(C) P-4,Q-1,R-2,S-3 (D) P-1,Q-2,R-3,S-4

39.

Group I (Drug)	Group II (Receptor agonist/antagonist)
P. Granisetron	1. β_1 adrenergic receptor antagonist
Q. Pirenzepine	2. GABA agonist
R. Acebutalol	3. $5HT_3$ antagonist
S. Baclofen	4. M_1 antagonist

(A) P-1,Q-2,R-3,S-4 (B) P-3,Q-4,R-1,S-2

(C) P-2,Q-3,R-4,S-1 (D) P-4,Q-1,R-2,S-3

40.

Group I (Drug)	Group II (Biotransformation)
P. Chlorpromazine	1. S-oxidation
Q. Thioridazine	2. Microsomal hydroxylation
R. Diazepam	3. Desulphuration
S. Thiopentone	4. N-dealkylation

(A) P-4,Q-1,R-2,S-3 (B) P-2,Q-3,R-4,S-1

(C) P-4,Q-3,R-2,S-1 (D) P-4,Q-2,R-3,S-1

41.

Group I (Drug)	Group II (7-Subtitution in 1, 3-dimethyl xanthine with)
P. Diprophylline	1. $-CH_2-CH(OH)-CH_2OH$
Q. Etophylline	2. $-CH_2-CH_2-N(CH_2-CH_3)(CH_2-CH_3)$
R. Etamiphylline	3. $-CH_2-CH_2-OH$
S. Proxyphylline	4. $-CH_2-CH(OH)-CH_3$

(A) P-3,Q-2,R-4,S-1 (B) P-2,Q-4,R-3,S-1

(C) P-1,Q-3,R-2,S-4 (D) P-1,Q-4,R-3,S-2

42.

Group I Equipment	Group II To determine
P. Cascade Impactor	1. Flash point
Q. Tag Open Cup apparatus	2. Sedimentation rate
R. Pycnometer	3. Particle size
S. Rheometer	4. Density of liquid

(A) P-3,Q-1,R-4,S-2 (B) P-1,Q-3,R-2,S-4

(C) P-4,Q-2,R-3,S-1 (D) P-2,Q-3,R-1,S-4

43.

Group I Classification	Group II Penetration enhancer
P. Ionic surfactant	1. Terpenes
Q. Nonionic surfactant	2. Polyoxyethylene-20-cetyl ether
R. Non surfactant	3. Polyethylene-9-lauryl ether
S. Chelating agent	4. Citric acid

(A) P-3,Q-2,R-1,S-4 (B) P-2,Q-3,R-1,S-4

(C) P-3,Q-4,R-1,S-2 (D) P-4,Q-2,R-3,S-1

44.

Group I Transdermal drug delivery system	Group II Method of penetration
P. Membrane modulated system	1. Drug is homogenously dispersed in polymer and then moulded into a patch
Q. Diffusion controlled system	2. Drug reservoir is encapsulated in rate controlling polymer patch
R. Matrix dispersion system	3. Drug is dispersed in hydrophilic polymer and then cross linked with lipophilic polymer by high shear mechanical force
S. Microreservoir system	4. Drug is directly dispersed in polymer patch

(A) P-2,Q-4,R-1,S-3 (B) P-1,Q-2,R-3,S-4

(C) P-1,Q-4,R-2,S-3 (D) P-4,Q-1,R-3,S-2

45.

Group I Term used	Group II Explanation
P. Chromophore	1. Amino group
Q. Blue shift	2. Increase in wavelength of absorption
R. Auxochrome	3. Decrease in wavelength of absorption
S. Red shift	4. Carbonyl group

(A) P-4,Q-3,R-1,S-2 (B) P-3,Q-1,R-2,S-4

(C) P-1,Q-2,R-3,S-4 (D) P-2,Q-4,R-3,S-1

46.

Group I Symbol	Group II Description
P. v	1. Specific resistance
Q. id	2. Chemical shift
R. δ	3. Diffusion current
S. ρ	4. Frequency

(A) P-3,Q-4,R-1,S-2 (B) P-2,Q-1,R-4,S-3

(C) P-4,Q-3,R-2,S-1 (D) P-1,Q-2,R-4,S-3

47.

Group I Type of inhibitor	Group II Description
P. Competitive inhibitors	1. have affinity only for the [E-S] complex and not for the free [E]
Q. Non-competitive inhibitors	2. binding of the inhibitor and that of the natural substrate are mutually exclusive
R. Uncompetitive inhibitors	3. ultimately binds covalently to the enzyme
S. Suicide inhibitors	4. binds with the same affinity to [E] and [E-S]

(A) P-3,Q-2,R-1,S-4 (B) P-1,Q-3,R-2,S-4

(C) P-4,Q-1,R-3,S-2 (D) P-2,Q-4,R-1,S-3

48.

Group I Process	Group II Required molecules
P. Post translation modification	1. Signal peptidase
Q. DNA repair	2. Sigma factor
R. Control of prokaryotic transcription	3. Proteasome complex
S. Protein degradation	4. Photolyase

(A) P-1,Q-4,R-2,S-3 (B) P-2,Q-3,R-1,S-4

(C) P-3,Q-2,R-4,S-1 (D) P-2,Q-1,R-3,S-4

49.

Group I Microorganism	Group II Typical characteristics
P. Corynebacterium diptheriae	1. Cells divide in three planes in an irregular pattern, producing 'bunches'
Q. Streptococcus pyogenes	2. Cells are lined side by side like matchsticks and at angles to one another
R. Staphylococcus aureus	3. long, branched, multinuclear filaments called 'hyphae'
S. Streptomyces viridochroma	4. cells divide in one plane and remain attached to form chain

(A) P-3,Q-4,R-2,S-1 (B) P-4,Q-1,R-2,S-3

(C) P-2,Q-4,R-1,S-3 (D) P-3,Q-2,R-1,S-4

50.

Group I Condition	Group II Description
P. Agranulocytosis	1. Reduced lifespan of erythrocytes
Q. Anisocytosis	2. Lack of neutrophils
R. Aplastic anemia	3. Abnormal variation in RBC size
S. Hemolytic anemia	4. Depression of synthesis of all cell types in bone marrow

(A) P-2,Q-3,R-4,S-1 (B) P-2,Q-4,R-3,S-1

(C) P-1,Q-2,R-4,S-3 (D) P-4,Q-2,R-1,S-3

Common Data Questions: 51 & 52

Transgenic plants are developed by genetic engineering techniques

51. The method involves

(A) Individual genes from one species inserted into another; the offspring will contain copies of new gene.

(B) By crossing two species or varieties differing at least in one set of characters

(C) Exposing the plant tissue to radiation

(D) Bioproduction of natural compounds under aseptic conditions

52. In the production of transgenic plants, the gene transfer is carried out by

(A) Induction of meristematic primordial (B) Gel filtration

(C) Clonal propagation (D) Silicon carbide whiskers

Common Data Questions: 53 & 54

53. In the design of Captopril, the

(A) -COOH group is introduced in proline to enhance the binding capability at the receptor site

(B) -SH group is introduced to enhance the binding capability of the drug with cobalt ion of ACE

(C) -SH group is introduced to enhance the binding to the zinc ion of ACE

(D) -COOH and –SH groups to introduce hydrophilic pockets at the receptor site

54. Captopril IP is assayed by titration

(A) against 0.1N sodium hydroxide using phenolphthalein indicator

(B) of a solution in dimethylformamide with 0.1M of tetrabutyl ammonium hydroxide

(C) of a solution in anhydrous formic acid and acetic anhydride with 0.1N perchloric acid

(D) of a solution containing 1.8M sulphuric acid and potassium iodide with 0.025M potassium iodate using starch solution

Common Data Questions: 55 & 56

55. Lyposomes are used as carriers for drugs and macromolecules in pharmaceutical formulations. They are

(A) Phospholipids dispersed gently in aqueous medium to obtain multilamellar vesicles

(B) Hydrophilic or lipophilic polymer matrix with a drug reservoir

(C) A shallow compartment moulded from a drug impermeable system and rate controlling polymeric membrane

(D) Microporous membrane made from ethylene / vinyl acetate polymer

56. They can interact by different mechanisms

(A) Biological fluid diffuses into the matrix and causes erosion of polymer

(B) Endocytosis by phagocytic cells of the reticuloendothelial system such as macrophages and Neutrophils

(C) Magnetic beads dispersed throughout the polymer matrix. On exposure the drug is released slowly by diffusion

(D) Receptor binding mediated by the peptide

Linked Answer Questions: Q.57 to Q.60 Carry Two Marks Each

Statement for Linked Answer Questions: 57 & 58

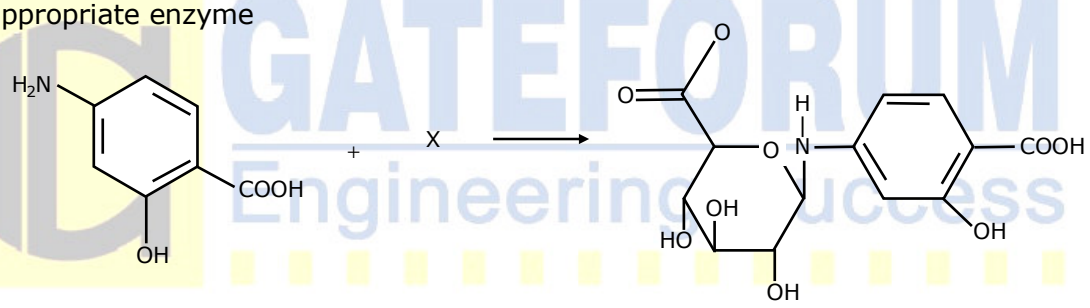
A Chinese tree Camptotheca acuminate is useful in cancer chemotherapy

57. The camptothecin present in the plant and useful in treating ovarian cancer is
(A) Etoposide (B) Vincristine (C) Paclitaxel (D) Topotecan

58. The drug selected above acts by
(A) Inhibiting topoisomerase I
(B) Inhibiting topoisomerase II
(C) Inhibiting thymidylate synthase
(D) Forming hydrogen peroxide which generates free radicals

Statement for Linked Answer Questions: 59 & 60

The compound A combined with X to get converted into B, in the presence of an appropriate enzyme



A **B**

59. The reaction can be described as
(A) Bioactivation
(B) Glucuronide conjugation
(C) β-Oxidation
(D) Stereospecific glycine conjugation

60. The significance of the above reaction in drug therapy is that the reaction
(A) Converts water soluble compound into a lipid soluble compound, thereby increasing its potency
(B) Converts an uncharged species into a charged species, increasing the shelf-life of the compound
(C) Adds an ionic hydrophilic moiety, facilitating its urinary elimination
(D) Adds a bulky substituent to convert it into an active compound