GPAT QUESTION PAPER 2011 WITH ANSWER KEY

GPAT QUESTIONS

1. A glycoalkaloid

   [P] Contains sulphur in addition to nitrogen in its molecule

   [Q] Is glycosidic in nature.

   [R] Can be hydrolysed to an alkaloid.

   [S] Always contains endocyclic nitrogen in its molecule.

   (a) P&R (b) Q&S (c) Q&R (d) P&Q

2. Which of the following statements are true for ginseng root

   [P] It is among the most traded plant material of Brazil

   [Q] It is obtained from *Panax ginseng* and *Panax quinquefolium*

   [R] It is obtained from young plants of six months to one year age

   [S] It contains derivatives of protopanaxadiol.

   (a) P&Q (b) R&S (c) Q&R (d) Q&S

3. Which of the following drugs is a triterpenoid containing root?

   (a) Valerian (b) Brahmi (c) Satavari (d) Adusa

4. Which of the following alkaloids is derived from tyrosine

   (a) Quinine (b) Morphine (c) Atropine (d) Ephedrine

5. The following options carry the name of the plant, part used and its family. Find awrong combination.

   (a) *Aegle marmelos*, fruit & Rutaceae

   (b) *Conium maculatum*, fruit & Umbelliferae

   (c) *Glycyrrhiza glabra*, root and stolon & Leguminosae

   (d) *Strophanthus gratus*, seed & Scrophulariaceae

6. Anomocytic stomata, trichomes with collapsed cell and absence of calcium oxalate crystals are some of themicroscopic features of which plant

   (a) Digitalis (b) Hyoscyamus (c) Mentha (d) Senna

7. Each of the following options lists the name of the drug, its class, pharmacologicalaction and plant source.Choose an option showing a wrong combination.

   (a) Asafoetida, oleo-gum-resin, anti-flatulence, *Ferula foetida*

   (b) Benzoin, balsam, antiseptic, *Styrax benzoin*

   (c) Myrrh, gum-resin, antiseptic, *Commiphora wightii*

   (d) Papaine, enzyme, proteolytic, *Carica papaya*

8. Quinoline alkaloids are biosynthesized via which one of the following pathways
   (a) Shikimic acid –tyrosine
   (b) Shikimic acid -tryptophan
   (c) Shikimic acid -cathinone
   (d) Shikimic acid -phenylalanine
9. Which of the following ergot alkaloids is water soluble and shows blue fluorescence
   (a) Ergosine
   (b) Ergotamine
   (c) Ergocristme
   (d) Ergometrine
10. Khellin is an active constituent of which one of the following plants
   (a) *Prunus serona*
   (b) *Tribulus terrestis*
   (c) *Ammi visnaga*
   (d) *Vanilla plamfolia*
11. Goldbeater's skin test is used to detect the presence of which one of the following classes of compounds
   (a) Tannins
   (b) Steroids
   (c) Glycerides
   (d) Resins
12. Which one of the following compounds is useful for the stimulation of cell division and release of lateral bud dormancy?
   (a) zeatin
   (b) 2, 4-Dichlorophenoxyacetic acid
   (c) Indole acetic acid
   (d) Picloram
13. Phenylethylisoquinoline is the precursor of which of the following alkaloids
   (a) Colchicine
   (b) Papaverine
   (c) Emetine
   (d) Cephaline
14. A powdered drug has the following microscopic characters: Anther cells, parenchyma,pollen grains,phloem fibers, volatile oil cells and stone cells. The powder is obtained from which of the followings?
   (a) Clove bud powder
   (b) Clove bud powder with stalk
   (c) Mother Cove
   (d) None of the above
15. Arrange the following fatty acids in decreasing order of their unsaturation (highest to lowest)
   [P] Stearic [Q] Oleic acid [R] Linolenic acid [S] Linoleic acid
   (a) P>Q>R>S
   (b) S>R>P>Q
   (c) R>S>Q>P
   (d) Q>P>R>S

16. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:
   Assertion (a): Tannins are polyphenolic substances occurring in plant cell sap. Hydrolysable and condensed tannins are differentiated by match stick test.
   Reason (r) : The condensed tannins are resistant to acid hydrolysis therefore stain the lignin present in matchstick.
   (a) Both (a) and (r) are true, and (r) is a correct reason for (a)
   (b) Both (a) and (r) are true, but (r) is NOT the correct reason for (a)
   (c) (a) is true but (r) is NOT the correct reason for (a)
   (d) Both (a) and (r) are false

17. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:
Assertion (a): Castor oil is soluble in alcohol and is used as purgative.
Reason (r) : The oil contains ricinoleic acid having a hydroxyl group at C-12 position which is responsible for its solubility in alcohol and its purgative action.
(a) Both (a) and (r) are true but (r) is NOT the correct reason for (a)
(b) (a) is true but (r) is NOT the correct reason for (a)
(c) Both (a) and (r) are true and (r) is the correct reason for (a)
(d) Both (a) and (r) are false

18. In acetate mevalonate pathway geranyl pyrophosphate leads to formation of monoterpenes, the major constituents of volatile oils.
[P] Geranyl pyrophosphate contains two isoprene units
[Q] Monoterpenes have 15 carbon atoms
[R] The two isoprene units condense in head to tail fashion to give Monoterpenes
[S] Isoprene unit has molecular formula of C_5H_8 .
which one of the given statements is correct?
(a) P is true. Q is false, R is true, S is false
(b) P is false. Q is true, R is true, S is false
(c) P is true. Q is true, R is fa1se, S is true
(d) P is true. Q is false, R is true, S is true

19. Two genetic types of Cannabis i.e. drug type and Hemp types are cultivated.
[P] Drug type cannabis is rich in (-) 9-trans-tetrahydrocannabinol
[Q] Hemp type cannabis is rich in cannabidiol
[R] Drug type cannabis is rich in cannabidiol
[S] Hemp type cannabis contains elongated bast fibres
which one of the given statements is correct?
(a) P is true, Q is true, R is true, S is true
(b) P is true, Q is false, R is false, S is true
(c) P is true, Q is true, R is false. S is true
(d) P is false, Q is false, R is true, S is false

20. Each of the following options lists a phytoconstituent, its phytochemical grouping,pharmacological activity and corresponding semisynthetic analogue. Find a MISMATCHING option
(a) Podophyllotoxin, lignan, anticancer, etoposide
(b) Sennoside, anthraquinone, laxative, sinigrin
(c) Atropine, alkaloid, anticholinergic, homatropine
(d) THC, terpenophenolic, psychoactive, nabilone

21. Inhibition/induction of which of the following Cytochrome P450 enzyme system ismost likely to be involved in important drug-drug interactions
(a) CYP3A4 (b) CYP2D6 (c) CYP2C9 (d) CYP1A2

22. Which of the following mechanisms is NOT related to platelet aggregation inhibitory action
(a) ADP receptor antagonism
(b) Glycoprotein IIb/IIIa receptor antagonism
(c) Phosphodiesterase inhibition
(d) Prostacyclin inhibition

23. Choose the correct statement about the given four diseases?

[P] Cardiomyopathy [Q] Rheumatoid arthritis

[R] Myasthenia gravis [S] Ulcerative colitis

(a) Q & S are autoimmune disorders (b) P & Q are autoimmune disorders

(c) P & R are not autoimmune disorders (d) R & S are not autoimmune disorders

24. Which of the following species is being inactivated by the enzyme Dipeptidyl Peptidase-4

(a) Oxytocin (b) vasopressin (c) Incretins (d) Glucagon

25. Patients taking isosorbide mononitrate or nitroglycerine should be advised not to take Sildenafil. This drug- drug interaction causes which of the following actions

(a) Respiratory failure (b) Severe hypotension

(c) Prolongation of QT interval (d) Myocardial ischemia

26. Which of the following drugs does NOT induce mydriasis?

(a) Atropine (b) Ephedrine (c) Phentolamine (d) Cocaine

27. Which of the following statements is TRUE for angiotensin-II

(a) Causes myocyte hypertrophy

(b) Decreases the action of sympathetic nervous system

(c) Increases force of myocardial contraction

(d) Decreases the synthesis and release of aldosterone

28. Which of the following beta blockers has been shown clinically to reduce mortality inpatients of symptomatic heart failure

(a) Atenolol (b) Carvedilol (c) Propranolol (d) Esmolol

29. All of the given four drugs cause vasodilatation. Choose the correct statement about them.

[P] Bradykinin [Q] Minoxidil [R] Acetylcholine [S] Hydralazine

(a) P & Q cause release of nitric oxide (b) Q & R do not cause release of nitric oxide

(c) R & S cause release of nitric oxide (d) P & S do not cause release of nitric oxide

30. Rhabdomyolysis is the side effect associated with which of the following classes of drugs

(a) ACE inhibitors (b) Statins

(c) Calcium channel blockers (d) Sodium channel blockers

31. Blood level monitoring of HbA1c is important in which of the given diseased states

(a) Hypercholesterolemia (b) Diabetes mellitus

(c) Myocardial infarction (d) Congestive heart failure

32. Most of the emergency contraceptives have which one of the following active ingredients

(a) Estradiol (b) Norethindron (c) Misoprostol (d) Levonorgesterol

33. Which of the following antibiotics produces concentration dependent bactericidal action and also possesses post-antibiotic effect

(a) Ceftazidime (b) Azithromycin (c) Amikacin (d) Piperacillin

34. Antiretroviral Raltegravir is unique, because of which of its following actions

(a) Integrase inhibition (b) CCR5 Co-receptor antagonism

(c) Fusion inhibition (d) Reverse transcriptase inhibition

35. What is chemotaxis
    (a) Toxicity of chemicals (b) Taxonomy of chemicals
    (c) Inhibition of Inflammation (d) Movement of leucocytes in inflammation
36. Which one of the followings is NOT an example of G-protein coupled receptor?
    (a) Muscarinic cholinergic receptor (b) Alpha adrenoceptor
    (c) Nicotinic cholinergic receptor (d) Beta adrenoceptor
37. Which of the followings used in the treatment of rheumatoid arthritis is NOT a biologic response modifier
    (a) Anakinra (b) Leflunomide (c) Etanercept (d) Infliximab
38. Which of the following statements is FALSE for artemisinin?
    (a) It is a sesquiterpene lactone endoperoxide
    (b) It is a drug of choice in prophylaxis of malaria
    (c) It does not cure relapsing malaria
    (d) It is useful in treatment of cerebral falciparum malaria
39. Which of the followings is a noncompetitive inhibitor of the enzyme reverse transcriptase in HIV
    (a) Lamivudine (b) Nevirapine (c) Abacavir (d) Tenofovir
40. Which of the followings is the most effective monotherapy for raising HDL cholesterol
    (a) Statins (b) Niacin (c) Ezetimibe (d) ω-3-Fatty acids
41. Which of the following parameters from plasma concentration time profile study givesindication of the rate of drug absorption?
    (a) C_{max} (b) T_{max} (c) AUC (d) $t_{1/2}$
42. Which of the following pairs has high binding affinity for 5α -reductase
    (a) Letrozole and androstenedione (b) Finasteride and testolactone
    (c) Finasteride and 5-DHT (d) Finasteride and testosterone
43. Which of the following skeletal muscle relaxants acts directly on the contractilemechanism of the muscle fibers
    (a) Pancuronium (b) Baclofen (c) Dantrolene (d) Chorzoxazone
44. Which is the molecular target for the vinca alkaloids as anticancer agents
    (a) Tyrosine kinase (b) DNA (c) Ribosomes (d) Tubulin
45. Choose the correct pair of the neurodegenerative disorders from those given below.
    (a) Parkinson's disease and Alzheimer's disease (b) Schizophrenia and Mania
    (c) Alzheimer's disease and Schizophrenia (d) Parkinson's disease and Autism
46. A 64 year old woman with a history of Type II diabetes is diagnosed with heart failure. which of the followings would be a Poor choice in controlling her diabetes
    (a) Metformin (b) Pioglitazone (c) Glipizide (d) Exenatide

47. Mifepristone and gemeprost combination is used for medical termination of pregnancy. The action is causeddue to which of the following mechanisms
    (a) Mifepristone is an antiestrogen while gemeprost is a prostaglandin E receptor agonist
    (b) Mifepristone is an antiprogestin while gemeprost is a prostaglandin E receptor agonist
    (c) Mifepristone is an antiandrogen while gemeprost is a prostaglandin E receptor agonist
    (d) Mifepristone is an antiprogestin while gemeprost is a prostaglandin E receptor antagonist
48. Which one of the followings is a β lactamase inhibitor
    (a) Penicillanic acid (b) Embonic acid
    (c) Cephalosporanic acid (d) Clavulanic acid
49. All of the followings are indications for use of ACE inhibitors Except for one. Identify that
    (a) Hypertension (b) Myocardial infarction
    (c) Left ventricular dysfunction (d) Pheochromocytoma
50. Neural tube defects may occur by which one of the following anti-seizure drugs
    (a) Ethosuximide (b) Vigabatrin (c) Valproic acid (d) Primidone
51. Which water is used for hand washing in a change room of pharmaceutical manufacturing plant?
    (a) Potable water (b) Purified water (c) Disinfectant water (d) Soap water
52. Which one of the following drying methods is commonly used in Pharma industry for dryingof soft shell capsules?
    (a) Truck drying. (b) Fluid bed drying (c) Vacuum drying (d) Microwave drying
53. Which one of the followings does NOT afford a macromolecular inclusion compound
    (a) Zeolites (b) Dextrins (c) Silica gets (d) Cyclodextrins
54. If C is the concentration of dissolved drug and Cs is the saturation concentration. In which case the sink conditions are said to be maintained?
    (a) C < 20% of Cs (b) C > 20% of Cs (c) C < 10% of Cs (d) C > 10% of Cs
55. Which condition does not apply as per Indian law while conducting single dose bioavailability study of an immediate release product
    (a) Sampling period should be at least three t1/2 el
    (b) Sampling should represent pre-exposure, peak exposure and post-exposure phases
    (c) There should be at least four sampling points during elimination phase
    (d) Sampling should be continued till measured AUC is at least equal to 80% of AUC
56. Upon standing sometimes gel system shrinks a bit and little liquid is pressed out. What is this phenomenon, known as
    (a) Oozing (b) Syneresis (c) Shrinking (d) Desolvation
57. Which of the following routes of administration of drugs is associated with Phlebitis
    (a) Subcutaneous (b) Intravenous (c) Intraspinal (d) Intradural

58. Study the following two statements and choose the correct answer

[P] Antibodies are serum proteins providing immunity.

[Q] IgG provides immunity to new born babies while IgM is the first generated antibody.

(a) P is correct and Q is incorrect
(b) P is incorrect and Q is correct
(c) Both P and Q are correct
(d) Both P and Q are incorrect

59. Which microbe is used for validation of sterilization by filtration process

(a) *Bacillus stearothermophilus*
(b) *Pseudomonas diminuta*
(c) *Bacillus subtilis*
(d) *Pseudomonas aeruginosa*

60. Non-linear pharmacokinetics can be expected due to

[P] Enzyme induction

[Q] Active secretion Choose the correct answer

(a) Both P and Q are true
(b) P is true, Q is false
(c) Q is true. P is false
(d) Both P and Q are false

61. Which wavelength of the UV light provides maximum germicidal action

(a) 253.7 nm (b) 275.5 nm (c) 283.5 nm (d) 240.0 nm

62. Which of the following statements is INCORRECT

(a) Chick Martin test uses organic matter in media
(b) The organism in Rideal-walker test is *S. typhi*
(c) Rideal-walker test uses organic matter in media
(d) The organism in Chick Martin test is *S. typhi*

63. Which of the following forces contribute to stability of charge-transfer complexes

(a) Resonance forces
(b) Resonance and London dispersion forces
(c) Dipole-dipole interactions and London dispersion forces
(d) Resonance forces and dipole-dipole interactions

64. Which of the following isotherms are produced when the heat of condensation of successive layers is more than the heat of adsorption of first layer

(a) Type III and IV
(b) Type II and V
(c) Type I and III
(d) Type III and V

65. Which of the followings act as a non-ionic emulsifying agent

(a) Triethanolamineoleate
(b) Polyoxyethylene sorbitan monooleate
(c) N-Cetyl-N-ethylmorpholinium ethosulfate
(d) Dioctylsulphosuccinate

66. The minimal effective flow rate of air in laminar flow hood should be not less than how many cubic feet per minute

(a) 10 (b) 50 (c) 100 (d) 1000

67. Which of the following Schedules include shelf life of drugs

(a) Schedule F (b) Schedule M (c) Schedule G (d) Schedule P

68. Which of the following pumps is used in handling of corrosive liquids
(a) Turbine pump (b) volute pump (c) Air binding pump (d) Peristaltic pump

69. By addition of which of the followings the shells of soft gelatin capsules may be madeelastic
(a) Polyethylene glycol (b) Sorbitol (c) Propylene glycol (d) Dibutyl phthalate

70. Convert 90% v/v alcohol to Proof strength. Choose the correct answer.
(a) 57.77° under proof (b) 57.77° over proof
(c) 47.41° over proof (d) 47.41° under proof

71. Department of Transport Test (DOT) is performed for which of the followings
(a) Strip packing (b) Aerosols (c) Injection packing (d) Glass containers

72. What is the Heat of vaporization of water at 100°C?
(a) 2790 cal/mole (b) 7290 cal / mole (c) 7920 cal/mole (d) 9720 cal/mole

73. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:
Assertion[a]: For a pharmaceutical powder true density is greater than the granule density.
Reason[r]: Mercury displacement used for determining granule density, allows penetration of liquid into internal pores of the particles.
(a) [a] is true but [r] is false
(b) Both [a] and [r] are false
(c) Both [a] and [r] are true and [r] is the correct reason for [a]
(d) Both [a] and [r] are true but [r] is NOT the correct reason for [a]

74. Determine the correctness or otherwise of the following statements:
[P] Rheopexy is the phenomenon when a sol forms gel more readily when sheared gently.
[Q] In a rheopectic system, sol is the equilibrium form.
[R] Rheopexy is a phenomenon when a sol forms gel when the material is kept at rest.
(a) [R] is true but [P] and [Q] are false (b) [P] is true but [Q] and [R] are false
(c) [P], [Q] and [R], all are false (d) [P], [Q] and [R], all are true

75. Define PlasmapheresisChoose the correct answer
(a) The process of collecting plasma and returning the red blood cells concentrate to thedonor
(b) The process of collecting red blood cells concentrate and returning the plasma to thedonor
(c) The process of separating whiteblood cells from blood
(d) The process of generating artificial blood plasma expanders

76. Moleculesin the smectic liquid crystals are characterized by which one of thefollowings
(a) Mobility in three directions and rotation in one axis
(b) Mobility in two directions and rotation in one axis
(c) Mobility in two directions and no rotation
(d) Mobility in three directions and no rotation

77. Choose the correct sequence of Moisture vapor Transmission Rate in packaging materials?
(a) Paper >Aluminium foil >PVC>PVdC (b) Aluminium foil >PVC>PVdC> Paper
(c) Aluminium foil>PVdC>PVC> Paper (d) Paper >PVC>PVdC>Aluminium foil

78. How many mL of 50% (w/v) dextrose solution and how many mL of 5% (w/v) dextrose solution are required to prepare 4500 mL of a 10 (w/v) solution?
(a) 500 mL of 50% and 4000 mL of 5% (b) 1000 mL of 50% and 3500 mL of 5%
(c) 4000 mL of 50% and 500 mL of 5% (d) 1500 mL of 50% and 3000 mL of 5%

79. A drug is administered to a 65 Kg patient as 500 mg tablets every 4 hours. Half-1ife ofthe drug is 3 h,volume of distribution is 2 liter/Kg and oral bioavailability of the drug is 0.85.Calcu1ate the steady state concentration of the drug
(a) 5.05mcg/ml (b) 4.50 mcg/ml (c) 3.53 mcg/ml (d) 3.00 mcg/ml

80. P-Glycoprotein pump is responsible for which one of the followings
(a) Transporting the drugs from the enterocytes into the gutlumen
(b) Transporting the drugs from gut lumen into enterocytes
(c) Transporting the drugs from oral mucosa into blood capillaries
(d) Transporting the drugs from Peyer's patches into the gut lumen

81. Statement [x]:Hofmeister series grades coagulating power of electrolytes as per their ionic size.
Statement[Y]:Therelative coagulating power is given by:
[P] $Al^{***} > Ba^{**}$ [Q] $Li^{+} > F^{-}$ [R] $NH^{+} > Na^{+}$
Choose the correct statement:
(a) Statement x is true but P, Q and R are false in Statement Y
(b) Statement x is false and P, Q and R arefalsein Statement Y
(c) Statement x is true and Q and R are false in Statement Y
(d) Statement x is false and P is false in Statement

82. The first stage of wetting on addition of a granulating agent to the powders is characterized by which one of the followings?
(a) Capillary state (b) Pendular state (c) Funicular state (d) Droplet state

83. Larger values of Ky in the Heckel Plot indicate formation of what quality of tablets?
(a) Harder tablets (b) Softer tablets (c) Fluffy tablets (d) Brittle tablets

84. The degree of flocculation of a suspension is 1.5 and the sedimentation volume is 0.75. what will be the ultimate volume of deflocculated suspension
(a) 2.0 (b) 1.5 (c) 0.75 (d)0.5

85. What will be the time required for a drug exhibiting first order rate constant of 4.6/hr to be degraded from initial concentration of 100 mg/ml to 10 mg/ml?
(a) 2 hr (b) 4hr (c) 9 hr (d) 0.5 hr

86. What will be the dose required maintaining therapeutic concentration of 20 µgm/ml for 24 hr of a drug exhibiting total clearance of 2 L/hr?
(a) 96 mg (b) 480 mg (c) 960 mg (d) 48 mg

87. What will be the urine to plasma ratio of a weakly acidic drug having pKa of 5?
[urine (pH : 5) plasma (pH : 7)]
(a) 1:101 (b) 1:201 (c) 2:101 (d) 1:202

88. The Reynolds number widely used to classify flow behavior of fluids is the ratio of which one of the followings:
    (a) Inertial forces to gravitational forces
    (b) Inertial forces to viscous forces
    (c) Viscous forces to inertial forces
    (d) viscous forces to gravitational forces
89. If the distillation graph using McCabe Thiele method is parallel to x-axis, then the feed is which one of the followings?
    (a) Saturated liquid
    (b) Saturated vapor
    (c) Superheated liquid
    (d) Superheated vapor
90. What for the baffles are provided in a shell and tube heat exchanger?
    (a) To increase turbulence
    (b) To decrease turbulence
    (c) To prevent corrosion
    (d) To increase shell side passes
91. SOS means which one of the followings
    (a) Take occasionally
    (b) Take immediately
    (c) Take when necessary
    (d) Take as directed
92. Which statement is FALSE for Association Colloids
    (a) They are also called amphiphiles
    (b) They contain aggregated molecules
    (c) They show partial solvation
    (d) They are also called micelles
93. Which of the followings is NOT a reciprocating pump
    (a) Plunger pump
    (b) Diaphragm pump
    (c) Gear pump
    (d) Piston pump
94. Which is NOT applicable to protein binding
    (a) Klotz reciprocal plot
    (b) Sandberg modified equation
    (c) Blanchard equation
    (d) Detli plot
95. Statement [P] : Soft gelatin capsules contain 12-15 % moisture.
    Statement [Q] : Hard gelatin capsule shells contain 6-10 % moisture.
    Choose the correct statement? http://www.xamstudy.com
    (a) Both of the above statements P&Q are true
    (b) Both of the above statements P&Q are false
    (c) Statement P is true and Q is false
    (d) Statement P is false and Q is true
96. According to USP, the speed regulating device of the dissolution apparatus should be capable of maintainingthe speed within limits of what % of the selected speed?
    (a) 1%
    (b) 2%
    (c) 4%
    (d) 5%
97. A drug whose solubility is 1 g/L in water, when given orally at a dose of 500 mg is absorbed up to 95% of the administered dose. The drug belongs to which class according to the BCS classification?
    (a) Class I
    (b) Class II
    (c) Class III
    (d) Class IV
98. Which statement is NOT true for steam distillation
    (a) It is also called differential distillation
    (b) It can be used for separation of immiscible liquids
    (c) It can be applied for volatile substances
    (d) It can be used for separation of miscible liquids

99. The area of clear opening of any two successive sieves according to Tyler standard is in the ratio of-----.
(a) 1 : 4 (b) 1 : 6 (c) 1 : √2 (d) 1 : √3

100. What is Primogel
(a) Substituted HPMC for direct compression
(b) Modified microcrystalline cellulose for direct compression
(c) Hydro gellingpolymerfor gel formation
(d) Modified starch for disintegration

101. A tooth paste contains stannous fluoride and calcium pyrophosphate along with other formulation constituents. Choose the correct statement out of the followings?
(a) Stannous fluoride is an anticaries agent while calcium pyrophosphate is a dentifrice
(b) Stannous fluoride is a dentifrice while calcium pyrophosphate is a desensitizing agent
(c) Stannous fluoride is a desensitizing agent while calcium pyrophosphate is an anticaries agent
(d) Both are dentifrices while calcium pyrophosphate is additionally a desensitizing agent

102. Hydrogen peroxide solution (20 volumes) is used topically as a mild antiseptic. It is mainly used for cleaning of wounds which could be due to some of the following actions of hydrogen peroxide.
[P] Astringent action
[Q] Nascent hydrogen releasing action
[R] Oxidizing action
[S] Mechanical cleansing action Choose the correct statements for the use of hydrogen peroxide as cleaning agent for wounds
(a) P&R (b) P&Q (c) R&Q (d) R&S

103. Magnesium trisilicate is considered to be a better antacid than aluminium hydroxide due to its following additional properties:
[P] It has a fixed chemical composition
[Q] It forms colloidal silicone dioxide
[R] Magnesium ions overcome constipation
[S] Magnesium ions cause higher inhibition of pepsin than aluminium ions Choose the correct combination of statements
(a) Q&S (b) R&S (c) P&Q (d) Q&R

104. Boric acid is a weak acid (pKa 9.19) which cannot be titrated with a standard solution of sodium hydroxide using phenolphthalein as indicator. This titration becomes possible on addition of glycerol due to one of the following reactions. Choose the correct reaction
(a) Boric acid becomes boronic acid on reaction with glycerol
(b) Boric acid gives a monoprotic tetravalent boron ester with glycerol
(c) Boric acid gives a tribasic acid on reaction with glycerol
(d) Two boric acid molecules combine to give an anhydride in presence of glycerol

105. An iron compound used as heamatinic agent must meet two requirements i.e. it should be biologically available and be non-irritating. Which one of the following compounds meet the above two requirements most closely

(a) Ferric chloride
(b) Ferric ammonium sulphate
(c) Ferric ammonium citrate
(d) Ferrous thioglycollate

106. Iodine-131 as sodium iodide solution is used as a radiopharmaceutical for diagnostic and therapeutic purposes. Its usage is dependent on the release of the following emissions:

[P] Alpha particles
[Q] Positrons
[R] Beta emission
[S] Gamma radiation Choose the correct combination of statements

(a) R&S
(b) Q&S
(c) P&R
(d) P&S

107. Arrange the following Lowry-Bronsted acids into their decreasing order of acidity (highest to lowest)

[P] C_2H_5OH
[Q] $H_3C-C\equiv CH$
[R] H_2O
[S] CH_3NH_2

(a) R>P>Q>S
(b) P>R>Q>S
(c) P > Q > R > S
(d) R > Q > P > S

108. Alkenes show typical electrophilic addition reactions. If an electron withdrawing group is attached to one of the carbons bearing the double bond, what will happen to the mechanism of the addition reaction

(a) It remains electrophilic
(b) It becomes free radical addition
(c) It becomes pericyclic reaction
(d) It becomes nucleophilic

109. Aprotic polar solvents increase the rate of SN2 reactions manifold. Enhancement in the rate of such reactions is due to which one of the following effects

(a) Solvation of the anion by the solvent leaving the cation unaffected
(b) Solvation of both of the ionic species
(c) Desolvation of the cation and solvation of the anion
(d) Solvation of the cation by the solvent leaving the anion unaffected

110. Five-membered heteroaromatic compounds show a much higher rate of electrophilic aromatic substitutionreactions than the six-membered ones. This is due to which one of the following reasons?

(a) Five-membered heteroaromatic compounds have higher circulating electron density in the ring than the six-membered ones
(b) Five-membered heteroaromatic compounds have lower circulating electron density in the ring than the six-membered ones
(c) Five-membered rings are smaller in size than the six membered ones which affects their reaction rates
(d) Six membered heteroaromatic rings are flat while the five-membered ones are puckered

111. Pyridine is more basic than pyrrole. This is due to which of the following facts

(a) Lone pair of electrons on N in pyrrole is localized
(b) Lone pair of electrons on N in pyridine is localized
(c) Nitrogen of pyrrole has one hydrogen atom attached to it while pyridine does not haveany
(d) Pyridine has three double bonds while pyrrole has only two

112. Diels-Alder reaction can be carried out in which of the following heterocyclic compounds most readily
(a) Pyrrole (b) Thiophene (c) Furan (d) Pyridine

113. In nucleophilic aliphatic substitution reactions arrange the following leaving groups in decreasing order of their leaving capacity?
[P] Brosyl [Q] Hydroxyl [R] Chloro [S] Mesyl
(a) S > R > P > Q (b) P > S > R > Q (c) R>Q>S>P (d) R>S>Q>P

114. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:
Assertion (a): Quaternary ammonium phase transfer catalysts can enhance the rate of nucleophilic aliphatic substitution reactions in biphasic systems with water soluble nucleophiles.
Reason (r): Quaternary ammonium compounds are highly polar, positively charged water soluble compounds.
(a) Both (a) and (r) are true but (r) is not the correct reason for (a)
(b) Both (a) and (r) are true and (r) is the correct reason for (a)
(c) (a) is true (r) is false
(d) Both (a) and (r) are false

115. Which one of the given compounds can be used as primary standard for standardization of perchloric acid solution in non-aqueous titrations?
(a) Potassium hydrogen phthalate (b) Sodium bicarbonate
(c) Potassium dihydrogen phosphate (d) Sodium methoxide

116. In context of complexometry (complexometric titrations), the two terms labile and inert complexes, are used frequently. Choose the correct statement about them?
(a) Labile complexes are formed instantly while inert complexes take hours or days in their formation
(b) Labile complexes take much longer time in formation than inert complexes
(c) Labile complexes get hydrolyzed in water immediately while inert complexes are stable in water
(d) Labile complexes get decomposed on mild heating in aqueous solutions while inert complexes do not decompose

117. Indicators used in complexometric titrations are chelating agents. Choose the correct statement about them
(a) Indicator-metal ion complex should have higher stability than EDTA-Metal ion complex
(b) Indicator-metal ion complex should have lower stability than EDTA-Metal ion complex
(c) Indicator-metal ion complex should have equal stability as EDTA-Metal ion complex
(d) Stability of the indicator-metal ion complex is not an important criterion in complexometric titrations

118. In colorimetric estimation of a drug, the following sequence of reactions is carried out: treatment of the aqueous solution of the drug with sodium nitrite solution in acidic medium followed by addition of sulphamic acid and then treatment with N-(l-naphthyl) ethylene- diamine in slightly basic medium to obtain a pink colour; which is measured at a fixed wavelength tocorrelate the quantity of the drug with the optical density. Identify the drug under estimation
(a) Streptomycin sulphate (b) Thiamine hydrochloride
(c) Dexamethasone (d) Sulphamethoxazole

119. Name the compound used for standardization of Karl-Fisher reagent in aquametry?

(a) Sodium tartrate dihydrate
(b) Copper sulphate pentahydrate
(c) Sodium iodide
(d) Sodium thiosulphate

120. In the electrochemical series, the standard reduction potentials of copper and zinc are +0.337 v and -0.763 v, respectively.If the half cells of both of these metals are connected externally to each other through an external circuit and a salt bridge, which one of the following processes will take place?

(a) Zinc metal electrode will start dissolving in solution while copper ions will start depositing on the copper electrode.
(b) Copper metal electrode will start dissolving in solution while zinc ions will start depositing on the zinc electrode
(c) Both of the metal electrodes will start dissolving in the solution
(d) Both types of ions will start depositing on their respective electrodes

121. In polarography. DME has a number of advantages. One of the advantages is that mercury has large hydrogen over potential. It means which one of the followings?

(a) Hydrogen ions get easily reduced on the DME
(b) Hydrogen gas gets easily reduced on the DME
(c) Hydrogen ions require high potential to be reduced at DME
(d) Water is difficult to get oxidized at DME

122. Following are the desirable properties of the liquid phase used in GLC EXCEPT for one of the followings. Identify that.

(a) It should be inert to the analytes
(b) It should have high viscosity at operating temperature
(c) It should have low vapour pressure at the operating temperature
(d) It should have a high resolving power

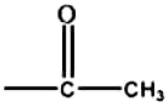
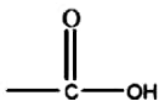
123. In HPLC analysis what type of column would you prefer

(a) A column with high HETP and high number of plates
(b) A column with low HETP and low number of plates
(c) A column with high HETP and low number of plates
(d) A column with low HETP and high number of plates

124. To synthesize sulphonyl urea antidiabetic, which of the following reactions can be used

(a) Reacting a suitably substituted sulphonyl chloride with a desired urea derivative under basic conditions
(b) Reacting a suitably substituted sulphonamide with a desired isocyanate derivative
(c) Reacting a suitably substituted sulphonic acid with adesired isocyanate derivative
(d) Reacting a suitably substituted sulphoxide with a desired urea derivative

125. In an optically active organic compound a chiral carbon has the following attached groups: using Sequence Rules choose the correct order of priority of the groups.

[P]  [Q]  [R] $-CH = CH_2$ [S] $-C \equiv CH$

Using 'Sequence Rules' choose the correct order of priority of the groups

(a) Q>P>S>R (b) P>Q>R>S

(c) Q>P>R>S (d) P>Q>S>R

126. The following statements are given:

[P] Conformational isomers are interconvertible by rotation around a single bond while configurational isomers cannot be interconverted without breaking a bond.

[Q] Configurational isomers could be optically active or optically inactive while conformational isomers are optically inactive

[R] Geometric isomers must have a double bond in their structures

[S] Geometric and optical isomers are the two distinct categories of configurational isomers.

Choose the correct combination of statements.

(a) P, Q & S are true while R is false

(b) P, R & S are true while Q is false

(c) Q, R & S are true while P is false

(d) P, Q & R are true while S is false

127. A carbocation will NOT show one of the following properties. Choose that.

(a) Accept an electron to give a carbene

(b) Eliminatea proton to afford an alkene

(c) Combine with a negative ion

(d) Abstract a hydride ion to form an alkane

128. Determine the correctness or otherwise of the following Assertion (a) And the Reason (r):

Assertion (a): Formaldehyde and benzaldehyde both undergo Cannizaro reaction while acetaldehyde and Phenyacetaldehyde undergo Aldol condensation.

Reason(r): Aldehydes can undergo both Cannizaro as well as Aldol condensation while ketones undergo only Cannizaro reaction.

(a) Both (a) and (r) are false

(b) (a) is true but (r) is false

(c) (a) is fa1se but (r) is true

(d) Both (a) and (r) are true

129. Choose the FALSE statement for E 2 mechanism in elimination reactions?

(a) These reactions are accompanied by rearrangements

(b) These reactions show a large hydrogen isotope effect

(c) These reactions show a large element effect

(d) These reactions are not accompanied by hydrogen exchange

130. Choose the correct statement for writing the sequence of amino acids in a polypeptide?

(a) Amino terminal is to be written on the left hand side while the carboxyl terminal is to be written on the right hand side

(b) Carboxyl terminal is to be written on the left hand side while the amino terminal is to be written on the right hand side

(c) Any of the amino acid terminals can be written on any sides but it is to be mentioned by specifying the amino terminal and the carboxyl terminal in abbreviations

(d) It varies from author to author how the sequence of amino acids in a polypeptide is to be written

131. BETA-Carboline ring system is present in

(a) Emetine (b) Riboflavine (c) Deserpidine (d) d-Tubocurarine

132. Which one of the fo11owings is NOT a bioisosteric pair?

(a) Divalent ether (-0-) and amine (-NH) (b) Hydroxyl (-OH) and thiol (-OH)

(c) Carboxylate (CO_2^-) and sulfone (SO_2) (d) Hydrogen(-H) and fluorine (-F)

133. Of the four stereoisomers of chloramphenicol which one is the biologically active isomer

(a) L-Erythro (b) L-Threo (c) D-Erythro (d) D-Threo

134. Thecatalytic triad in acetyl cholinesteraseis composed of which of the following amino acid residues?

(a) Serine, Histidine and Glutamate (b) Serine, Arginine and Glutamate

(c) Threonine, Histidine and Aspartate (d) Threonine, Arginine and Glutamate

135. Fajan's method of titrimetric analysis involves detection of the end point on the basis of which one of the followings

(a) Colour change (b) Appearance of a precipitate

(c) Neutralization reaction (d) Adsorption phenomenon

136. Which of the following statements is true?

(a) Aliphatic protons have chemical shifts > 7 ppm

(b) Spin quantum number of proton is 1

(c) Chemical shift describes electronic environment of a proton

(d) Vicinal coupling constant is always higher than geminal coupling constant

137. In FT-IR instruments Michaelson interferometer is used in place of grating. The function of the interferometer is to act as a modulator'. What do you understand by this statement?

(a) The function of the interferometer is to act as a monochromator

(b) The function of the interferometer is to convert high frequency radiations into low ones

(c) The function of the interferometer is to convert low frequency radiations into high ones

(d) The function of the interferometer is to convert frequency domain spectra into time domain spectra

138. Polyamine polystyrene resins belong to which category of ion-exchange resins?
(a) Strongly Acidic Cation Exchange Resins (b) Strongly Basic Anion Exchange Resins
(c) Weakly Acidic Cation Exchange Resins (d) Weakly Basic Anion Exchange Resins

139. Discrepancies in potential measurements involving factors like alkaline error and asymmetry potential are associated with which of the following electrodes?
(a) Hydrogen electrode (b) Quinhydrone electrode
(c) Saturated calomel electrode (d) Glass Electrode

140. Which amongst the following auxochromes produces a shift towards higher energy wave length?
(a) –CH3 (b) –NHCH3 (c) –Cl (d) –C=O

141. What is the wave number equivalent of 400 nm wavelength?
(a) 0.0025 cm^{-1} (b) 0.25 cm^{-1} (c) 2500 cm^{-1} (d) 25000 cm^{-1}

142. Chloroformis stored in dark colored bottles because it is Oxidized in presence of light and air to a toxic compound. Identify that.
(a) CH_2Cl_2 (b) $COCl_2$ (c) CO (d) CCl_4

143. All Of the given compounds show n* transition. Identify which one will have the highest λmax?
(a) Methanol (b) Methylamine (c) Methyl iodide (d) Methyl bromide

144. Given are the four statements about NMR:
[P] 13CMR is a less sensitive technique than PMR
[Q] Both 13C and H have I =1/2
[R] Precessional frequency of the nucleus is directly proportional to the applied magnetic field
[S] Deuterium exchange studies can be performed to ascertain protons attached to heteroatoms.
Choose the correct combination of statements.
(a) P, Q & R are true while S is false (b) R, S & Q are true while P is false
(c) S, P & Q are true while R is false (d) All are true

145. Which of the following statements is WRONG?
(a) The energy required for removing an electron from a molecule varies in the given order : lone pair < conjugated n < non conjugated n < a
(b) Isotopic ratio is particularly useful for the detection and estimation of number of S, Cl and Br atoms in the compound in MS
(c) Neutral fragments and molecules do not get detected in the detector in MS
(d) The most intense peak in the MS is called the molecular ion peak

146. Which one is an example of a bulk property detector used in HPLC?
(a) Fluorescence detector (b) Photo diode array detector
(c) Refractive index detector (d) UV detector

147. The protons orthoto the nitro group in p-nitrotoluene are examples of which one of the Following types
(a) Chemically equivalent but magnetically non-equivalent protons
(b) Chemically and magnetically equivalent protons
(c) Chemically and magnetically nonequivalent protons
(d) Chemically nonequivalent but magnetically equivalent protons

148. A 250 kg/mL solution of a drug gave an absorbance of 0.500 at 250 nm at a path length of 10 mm. what is the specific absorbance of the drug at 250 nm ?

(a) 0.002 $cm^{-1}gm$ -1 1itre
(b) 0.002 $cm^{-1}gm^{-1}$ dl
(c) 20 $cm^{-1}gm^{-1}$ 1itre
(d) 20 $cm^{-1}gm^{-1}$ dl

149. The peak at m/z 91in the mass spectrum for alkyl benzenes is due to which one of the followings

(a) Alpha fission
(b) Retro Diels-Alder rearrangement
(c) Mc-Laffartey rearrangement
(d) Tropylium ion formation

150. Following statements are given for a chemical reaction: Change in Gibb's free energy of the reaction has a negative value. Change in Enthalpy of the reaction has a negative value Change in Entropy of the reaction has a positive value Based on the above statements choose the correct answer.

(a) The reaction is spontaneous.
(b) The reaction is non-spontaneous.
(c) The reaction could either be spontaneous or non-spontaneous.
(d) The reaction can never be spontaneous.

End of paper

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1-c	2-d	3-c	4-b/d	5-d	6-a	7-c	8-b	9-d	10-c
11-a	12-a	13-a	14-b	15-c	16-b	17-c	18-d	19-b	20-b
21-a	22-d	23-b	24-c	25-b	26-c	27-a	28-b	29-c	30-b
31-b	32-d	33-c	34-a	35-d	36-c	37-b	38-b	39-b	40-b
41-b	42-d	43-c	44-d	45-a	46-b	47-b	48-d	49-d	50-c
51-b	52-b	53-d	54-c	55-d	56-b	57-b	58-c	59-b	60-a
61-a	62-c	63-b	64-d	65-b	66-c	67-d	68-d	69-b	70-b
71-b	72-d	73-a	74-b	75-a	76-b	77-d	78-a	79-d	80-a
81-a	82-b	83-a	84-d	85-d	86-c	87-b	88-b	89-b	90-a
91-c	92-a	93-c	94-d	95-b	96-c	97-b	98-d	99-c	100-d
101-a	102-d	103-d	104-b	105-c	106-a	107-a	108-a	109-d	110-a
111-b	112-c	113-b	114-b	115-a	116-a	117-b	118-d	119-c	120-a
121-c	122-b	123-d	124-b	125-a	126-a	127-d	128-b	129-a	130-a
131-c	132-c	133-d	134-a	135-d	136-c	137-d	138-d	139-d	140-d
141-d	142-b	143-d	144-d	145-d	146-c	147-b	148-d	149-d	150-a