

Total No. of Printed Pages : 21

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ARE ASKED TO DO SO)

A

SET-X

Ph.D./URS-EE-Jan-2022

SUBJECT : Pharmaceutical Science

10001

Sr. No. ....

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Father's Name \_\_\_\_\_

Mother's Name \_\_\_\_\_ Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

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(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE  
STARTING THE QUESTION PAPER.**

1. **All questions are compulsory.**
2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
7. Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. **Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

**PHD/URS-EE-2022/(Pharmaceutical Science)(SET-X)/(A)**

1. Identify the incorrect statement from among the following :

- (1) Aromatic compounds are Planar
- (2) Aromatic compounds are cyclic
- (3) Aromatic compounds have  $4n$  electrons
- (4) Aromatic compounds are generally less reactive than similarly substituted alkenes.

2. In electrophilic aromatic substitution reactions the halides are :

- (1) *Ortho/para* directing and activating
- (2) *Ortho/para* directing and deactivating
- (3) *Meta* directing and activating
- (4) *Meta* directing and deactivating

3. A drug follow zero order degradation kinetics with rate constant  $k_0 = 0.70$  / day. The initial concentration of drug solution is 75 mg/ml. What would be the concentration of solution after seven days ?

- (1) 70.9 mg/ml
- (2) 71.8 mg/ml
- (3) 72.9 mg/ml
- (4) 69.1 mg/ml

4. How many grams of active ingredient would be required to prepare 920 ml of 0.95% w/v solution ?

- (1) 8.74 gm
- (2) 874 mg
- (3) 9.5 gm
- (4) 950 mg

5. How many grams of the zinc oxide (10%, w/v) cream, be mixed with zinc oxide (1% w/v) cream to prepare 450 gm of zinc oxide (5% w/v) cream ?

- (1) 200 gm
- (2) 250 gm
- (3) 50 gm
- (4) 150 gm

6. How many ml of alcohol would be required to prepare 750 ml of 1 in 20 solution ?  
(1) 2 ml (2) 3.75 ml  
(3) 20 ml (4) 37.5 ml
7. A pseudoplastic liquid .....  
(1) becomes less viscous as the rate of shear increases  
(2) becomes more viscous as the rate of shear increases  
(3) becomes less viscous over time when a constant shear stress is applied  
(4) becomes more viscous over time when a constant shear stress is applied
8. What is the kinematic viscosity of a liquid that has a density of  $1.2 \text{ g cm}^{-3}$  and a dynamic viscosity of 2cP ?  
(1)  $0.6 \text{ m}^2 \text{ s}^{-1}$  (2)  $1.67 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$   
(3)  $1.67 \text{ m}^2 \text{ s}^{-1}$  (4)  $0.6 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$
9. Choose the *incorrect* statement :  
(1) Different polymorphic forms of a drug can have different melting points  
(2) Different polymorphic forms of a drug can have different molecular formulae  
(3) Different polymorphic forms of a drug can have different solubility  
(4) Different polymorphic forms of a drug can have different crystal habit
10. Which of the following represent the strongest intermolecular force of interaction ?  
(1) Hydrogen bond (2) Covalent bond  
(3) London dispersion (4) Dipole-dipole interaction
11. Diamorphine differs from morphine by the presence of :  
(1) two methyl groups (2) two acetyl groups  
(3) one acetyl group (4) one methyl group



12. Esomeprazole is the ..... of omeprazole.
- (1) (S)-enantiomer (2) (R)-enantiomer  
(3) E-isomer (4) racemic mixture
13. Which of the following is the most appropriate parameters for qualitative identification of substances in chromatography ?
- (1) Retention time (2) Resolution factor  
(3) HETP (4) Relative retention factor
14. Which of the following carbonyl compound reacts violently with water ?
- (1) Ethanal (2) Ethanoic acid  
(3) Ethanoyl chloride (4) Butan-2-one
15. The reaction of conversion of an aldehyde to alcohol is ..... .
- (1) Oxidation (2) Polymerization  
(3) Reduction (4) Esterification
16. Which one of the following compounds does not absorb light in the UV-Vis spectrum ?
- (1) Paracetamol (2) Diclofenac  
(3) Curcumin (4) Chloral hydrate
17. The primary site for amino acid catabolism is ..... .
- (1) Kidney (2) Liver  
(3) Brain (4) Adipose tissue
18. The tertiary structure of protein refers to :
- (1) the overall 3D shape (2) the sequence of amino acids  
(3) the sequence of nucleotides (4) the arrangement of subunits



19. Identify the **correct** statement for glycolysis :
- (1) The gluconeogenesis is the exact opposite of glycolysis.
  - (2) In glycolysis, the glucose is formed from pyruvate.
  - (3) Glycolysis can take place under anaerobic conditions.
  - (4) The mitochondria is the primary site of glycolysis.
20. What is the term used for drugs that are similar in structure to a known drug and which are used for the same purpose ?
- (1) copycat' drugs
  - (2) 'me-too' drugs
  - (3) derivative' drugs
  - (4) 'analogue' drugs
21. What is the term used for small molecules that bind to different regions of a binding site ?
- (1) epimers
  - (2) isomers
  - (3) isotopes
  - (4) epitopes
22. Which of the following is **not** an endogenous lead compound ?
- (1) neurotransmitter
  - (2) modulator
  - (3) alkaloid
  - (4) hormone
23. What bacterial enzyme aids the survival of *Helicobacter pylori* in the stomach ?
- (1) carbonic anhydrase
  - (2) urease
  - (3)  $\beta$ -lactamase
  - (4) transpeptidase
24. What sort of receptor is the nicotinic receptor ?
- (1) A G-protein coupled receptor
  - (2) A kinase linked receptor
  - (3) An intracellular receptor
  - (4) An ion channel

25. Which feature of acetylcholine interacts with the binding site of cholinergic receptors by hydrogen bonding ?
- (1) The acyl methyl group
  - (2) The ester
  - (3) The quaternary nitrogen
  - (4) All three N-methyl groups
26. Which of the following needs lie on the top of the pyramid as per Maslow's hierarchy need theory ?
- (1) Physiological needs
  - (2) Safety needs
  - (3) Self-actualization needs
  - (4) Esteem needs
27. The Theory of Leadership which states that the excellent leaders are born, not developed is :
- (1) The Trait Theory
  - (2) The Great Man Theory
  - (3) The Behavioural Theory
  - (4) The Transformational Theory
28. Which heterocyclic ring system is present in Rofecoxib ?
- (1) Furan
  - (2) Indole
  - (3) Pyridine
  - (4) Pyrrole
29. The drying process where Eutectic point is involved :
- (1) Fluid bed drying
  - (2) Tray drying
  - (3) Freeze-drying
  - (4) Both fluid bed and freeze drying

30. During distillation of mixtures of liquids, the one which evaporates first is .....  
(1) more volatile liquid (2) less volatile liquid  
(3) non-volatile liquid (4) immiscible liquid
31. Which of the following states that the rate of heat flow through a uniform material is directly proportional to the area and temperature gradient, while inversely proportional to the length of the path of flow :  
(1) Rittinger's Law (2) Zeroth Law  
(3) Fourier Law (4) Fick's Law
32. A powder is called the coarse powder if all the particles pass through a sieve with nominal mesh aperture of ..... and not more than 40% by weight through a sieve with nominal mesh aperture of .....  
(1) 710  $\mu\text{m}$ , 250  $\mu\text{m}$  (2) 350  $\mu\text{m}$ , 180  $\mu\text{m}$   
(3) 180  $\mu\text{m}$ , 125  $\mu\text{m}$  (4) 1700  $\mu\text{m}$ , 355  $\mu\text{m}$
33. What is observed during mixing of solids in V-Cone Blender, if the speed kept to high speed ?  
(1) Segregation (2) Sedimentation  
(3) Uniform dispersion (4) None of these
34. Corrosion of metals is fairly high in one of the following medium :  
(1) Acidic (2) Alkaline  
(3) Neutral (4) Non-Aqueous
35. The list of authoritative books of Ayurvedic, Sidhha and Unani Tibb system is given in ..... of the Drugs and Cosmetics Act 1940.  
(1) Schedule T (2) First Schedule  
(3) Schedule M<sub>1</sub> (4) Schedule P



36. .... deals with the list of drugs exempted from certain provisions governing manufacture and sale of drugs.
- (1) Schedule K (2) Schedule D  
(3) Schedule X (4) Schedule P
37. The label on containers for drugs for internal use, listed in Schedule X must contain the following information :
- (1) Symbol XR<sub>x</sub> in red letters on the top left corner  
(2) Manufacturing licence No.  
(3) Warning : To be sold by retail on the prescription of Registered Medical practitioner only  
(4) All of these
38. Which type of the bond geometry is associated with the complexes having coordination number 4 ?
- (1) Tetrahedral (2) Trigonal  
(3) Square planar (4) Linear
39. Identify the derived property of powders :
- (1) Surface area (2) Solubility  
(3) Size distribution (4) Porosity
40. Which of the following statement is NOT TRUE for Passive diffusion ?
- (1) It can be explained by Fick's Law  
(2) It is an energy independent process  
(3) Drugs moves against the concentration gradient  
(4) It is non saturable process

41. Which kind of molecules cannot pass through a pore transport ?
- (1) Low Molecular weight molecules
  - (2) Water-soluble drugs
  - (3) Molecules upto 400 Dalton
  - (4) Molecules greater than 400 Dalton
42. Non-linear pharmacokinetics can also be identified as ..... pharmacokinetics.
- (1) dose dependent
  - (2) enzyme capacity limited
  - (3) saturation
  - (4) All of the above
43. Which of the following is the characteristic of non-linear pharmacokinetics ?
- (1) Area under the curve is proportional to the dose
  - (2) Elimination half-life remains constant
  - (3) Area under the curve is not proportional to the dose
  - (4) Amount of drug excreted through remains constant
44. The Non-linear pharmacokinetic arises due to ..... .
- (1) Pathological alteration at any one of the various pharmacokinetic steps, such as absorption, distribution and/or elimination.
  - (2) Capacity-limited metabolism.
  - (3) Alteration in protein binding characteristics
  - (4) All of the above
45. Which of the following applies to non-compartmental pharmacokinetics ?
- (1)  $MRT = AUMC/AUC$
  - (2)  $AUMC = MRT/AUC$
  - (3)  $MRT = AUC/AUMC$
  - (4)  $AUC = AUMC/MRT$

46. The Wagner-Nelson-Method in compartment modelling is employed for the determination of ..... .
- (1) absorption rate constant ( $K_a$ ) from % ARA Vs time curve
  - (2) elimination rate constant ( $K_e$ ) from % ARA Vs time curve
  - (3) absorption rate constant ( $K_a$ ) from % ARA Vs Concentration curve
  - (4) Determination of plasma half life
47. Which of the following drug metabolism reaction is **not** conjugation ?
- (1) Glucuronidation
  - (2) Sulfate formation
  - (3) Hydrolysis
  - (4) Methylation
48. Identify the characteristic feature of colonic release systems.
- (1) They release the drug along the entire length of GIT
  - (2) They use enteric coating.
  - (3) They employ polymers that dissolve only in the alkaline pH of colon
  - (4) Both (2) and (3)
49. Anhydrous lactose offers advantage of ..... over lactose hydrate.
- (1) better flow properties
  - (2) absence of maillard reaction
  - (3) better compressibility
  - (4) none of the above
50. The B tooling and D tooling of tablet machine have different ..... .
- (1) punch and die length
  - (2) die length but same punch length
  - (3) punch and die diameter
  - (4) die diameter but same punch diameter



51. Which of the following describes salbutamol, a  $\beta_2$ -adrenoceptor agonists ?
- (1) Direct acting sympathomimetic
  - (2) Indirect acting sympathomimetic
  - (3) Direct acting parasympathomimetic
  - (4) Indirect acting parasympathomimetic
52. Which of the following physiological processes are **not** parts of the 'fight and flight' response of the body ?
- (1) Vasodilatation in skeletal muscle
  - (2) Increased gut motility
  - (3) Bladder relaxation
  - (4) Sweating
53. Where is the hormone erythropoietin produced in the body ?
- (1) Spleen
  - (2) Liver
  - (3) Thyroid
  - (4) Kidney
54. Partial agonists are molecules that .....
- (1) can always cause a maximal response irrespective of the presence of antagonists.
  - (2) have affinity toward the target receptor but no efficacy.
  - (3) have affinity and efficacy toward the target receptor.
  - (4) have an agonistic effect on the receptor, but only ever achieve a submaximal response
55. Which of the following statement is **correct** for bioavailability ?
- (1) Bioavailability describes the proportion of the drug administered that is metabolised very quickly and thus is not available to induce a physiological effect.
  - (2) Bioavailability describes the ability of the administered drug metabolites to cause undesirable physiological effects.
  - (3) Bioavailability is used to describe the fraction of the dose of drug administered that is present within the body and facilitates the desired physiological effects.
  - (4) Bioavailability is the length of time an administered drug is present in the body and thus is available to cause a physiological effect.

56. Microorganisms on culturing in nutrient broth show growth at different locations in the test tube. Match the location of growth with the characteristics of microbes.

Growth location	Microbial characteristics
I Bottom of the test tube	P Facultative anaerobe
II Whole of the test tube	Q Obligate aerobes
III Top of the test tube	R Microaerophile
IV Slightly below the top of the test tube	S Obligate anaerobes
(1) I-S, II-P, III-Q, IV-R	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

57. Match the following drugs with their therapeutic category.

Drugs	Therapeutic Indications
I Alogliptin	P MDR-Tuberculosis
II Bedaquiline	Q Cushing's disease
III Roflumilast	R Chronic obstructive pulmonary disease
IV Pasireotide	S Type 2 Diabetes mellitus
(1) I-S, II-P, III-Q, IV-R	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

58. Match the following NSAIDs with their chemical class :

NSAIDs	Chemical class
I Indomethacin	P Propionic acid derivative
II Ibuprofen	Q Pyrrolo-pyrrole derivative
III Diclofenac	R Indole derivative
IV Ketorolac	S Arylacetic acid derivative

(1) I-R, II-P, III-S, IV-Q

(2) I-P, II-Q, III-R, IV-S

(3) I-S, II-P, III-R, IV-Q

(4) I-S, II-R, III-P, IV-Q

59. In which of the following conditions Ketoacidosis is **not** present :

(1) Diabetes mellitus

(2) Starvation

(3) Dehydration

(4) Diabetes insipidus

60. Which of the following are **not** the signs of inflammation ?

(1) Swelling

(2) Pallor

(3) Redness

(4) Pain

61. The cancer cells in stage 2 .....

(1) have spread to other parts of the body

(2) may or may not have spread to lymph nodes

(3) have spread to the lymph nodes above collar bone

(4) are not spreading



62. The most common type of angina is :

- (1) Stable angina
- (2) Microvascular angina
- (3) Variant angina
- (4) Unstable angina

63. Match the following phytoconstituents with their chemical tests.

Alkaloid	Ring system
I Tropane	P Cocaine
II Indole	Q Reserpine
III Isoquinoline	R Emetine
IV Diterpene	S Aconine
(1) I-S, II-P, III-Q, IV-R	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

64. Match the following diuretics with their appropriate category.

Diuretic	Category
P Furosemide	I Carbonic anhydrase inhibitor
Q Spironolactone	II Phenoxyacetic acid derivative
R Ethacrynic acid	III Potassium sparing
S Acetazolamide	IV Sulphamoyl derivative
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-IV, Q-I, R-II, S-III	
(4) P-IV, Q-II, R-I, S-III	

65. Which of the following drugs can antagonise 5-HT ?
- (1) Cinnarizine (2) Cyproheptadine  
(3) Ondansetron (4) All of the above
66. Which of the following antidiabetic agent can cause lactic acidosis ?
- (1) Chlorpropamide (2) Phenformin  
(3) Glipizide (4) Metformin
67. Which of the following is a preferred drug for the management of osteoporosis caused by high-dose use of glucocorticoids ?
- (1) Alendronate (2) Calcitonin  
(3) Mestranol (4) Vitamin D
68. Identify the potassium channel opener from among the following :
- (1) Pinacidil (2) Hydralazine  
(3) Glibenclamide (4) Amiloride
69. Metronidazole is least likely to be effective in the treatment of :
- (1) Amebiasis  
(2) Giardiasis  
(3) Pseudomembranous colitis  
(4) Pneumocystosis
70. Identify the drug whose concurrent use is likely to cause failure of oral contraception :
- (1) Isoniazid (2) Rifampicin  
(3) Cimetidine (4) Propranolol

71. Match the drugs with their mechanism of action.

Drug	Mechanism
P Methotrexate	I Competitive inhibition of PABA uptake
Q Para Aminosalicyclic acid	II Nucleic acid binding to viral enzymes
R Acyclovir	III Inhibition of dihydrofolate reductase
S Rifampicin	IV Inhibition of DNA dependent RNA polymerase

(1) P-IV, Q-III, R-II, S-I,

(2) P-I, Q-III, R-II, S-IV

(3) P-IV, Q-II, R-III, S-I

(4) P-III, Q-I, R-II, S-IV

72. Which of the following is GABAB agonist ?

(1) Muscimol

(2) Baclofen

(3) Picrotoxin

(4) Bicuculline

73. Which of the following drug is used clinically for enuresis and chronic pain ?

(1) Bupropion

(2) Fluvoxamine

(3) Imipramine

(4) Phenelzine

74. Which of the following is used in methanol poisoning ?

(1) Ethanol

(2) Naltrexone

(3) Disulfiram

(4) None of the above

75. Which of the following is inverse agonist of benzodiazepine receptors ?

(1) Flumazenil

(2)  $\beta$ -Carbolines

(3) Chlordiazepoxide

(4) Glutethimide



76. In which of the following types of seizures Phenytoin is ineffective ?
- (1) Generalized tonic-clonic                      (2) Simple partial  
(3) Complex partial                                (4) Absence
77. Fluoxetine blocks the transport of .....
- (1) Serotonin                                        (2) Norepinephrine  
(3) Dopamine                                      (4) GABA
78. Which of the following is true for Isoniazid ?
- (1) It requires pyridoxine supplementation  
(2) It may discolor the tears, saliva, urine or feces orange-red  
(3) It causes ocular complications that are reversible if the drug is discontinued  
(4) It may be ototoxic and nephrotoxic

79. Match the followings :

Vitamin	Chemical name
P Vitamin B1	I Riboflavin
Q Vitamin B2	II Thiamine
R Vitamin B6	III Hydroxycobalamine
S Vitamin B12	IV Pyridoxine
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-IV, Q-I, R-II, S-III	
(4) P-II, Q-I, R-IV, S-III	

80. Match the crude drugs with their chemical tests.

Drug	Chemical Test
P Senna	I Meconic acid test
Q Digitalis	II Borntrager test
R Opium	III Fluorescence test
S Ergot	IV Keller-Killiani test

(1) P-IV, Q-III, R-II, S-I,

(2) P-I, Q-III, R-II, S-IV

(3) P-II, Q-IV, R-I, S-III

(4) P-II, Q-I, R-IV, S-III

81. The C-24 glycosides give the following test positive :

(1) Liberman's sterol test

(2) Baljet test

(3) Legal test

(4) All of the above

82. The IR spectrum of the organic liquid can be taken up by placing it between a pair of polished plate made of :

(1) Sodium chloride

(2) Potassium bromide

(3) Aluminium chloride

(4) Both (1) and (2)

83. Which of the following cannot be used as reference electrode ?

(1) Calomel electrode

(2) Glass electrode

(3) Silver/silver chloride electrode

(4) Standard Hydrogen electrode

84. Which of the following act as precursors for the biosynthesis of Atropine?  
(1) Ornithine and Phenylalanine (2) Tyrosine and Tryptophan  
(3) Tyrosine and Dopamine (4) Tryptophan and Dopamine
85. The biological source of Star Anise is :  
(1) *Pimpinella anisum* (2) *Illicium anisum*  
(3) *Illicium verum* (4) *Illicium religiosum*
86. Peruvidoside is naturally obtained from the following :  
(1) Dioscorea (2) Ginseng  
(3) Liquorice (4) Thevetia
87. Sapogenins are characterized by .....  
(1) Spiroketal side chain (2) 27 cholestane system  
(3) Spirostane structure (4) all of the above
88. Steroidal estrogens are produced semi-synthetically from the following plant sterol.  
(1) Gitogenin (2) Diosgenin  
(3) Ditogenin (4) Estrogenin
89. All are phytoestrogens except :  
(1) Genistein (2) Daidzein  
(3) Coumesterol (4) Diethylstilbesterol
90. Shinoda test is used for chemical evaluation of .....  
(1) Alkaloids (2) Flavanoids  
(3) Anthraquinones (4) Lipids

91. Stomatal number is defined as average number of stomata .....

- (1) per leaf blade
- (2) per  $\text{mm}^2$  area of leaf epidermis
- (3) per  $\text{cm}^2$  area of leaf epidermis
- (4) per  $\text{inch}^2$  area of leaf epidermis

92. Match the crude drugs with their respective trichome types.

Crude drug	Trichome types
P Cassia	I Lignified trichomes
Q Datura	II Appressed trichomes
R Stropanthus	III Multiseriate trichomes
S Nux-Vomica	IV Unicellular covering trichomes
(1) P-IV, Q-III, R-II, S-I,	(2) P-I, Q-III, R-II, S-IV
(3) P-IV, Q-I, R-II, S-III	(4) P-II, Q-I, R-IV, S-III

93. Which of the following crude drugs contain Eugenol ?

- (1) Coriander
- (2) Fennel
- (3) Tulsi
- (4) Cardamom

94. Ginkgo biloba is used for its ..... activity.

- (1) expectorant
- (2) lipid lowering
- (3) PAF antagonistic
- (4) antidepressant

95. Inulin renal clearance is used for measurement of .....

- (1) effective renal blood flow
- (2) glomerular filtration rate
- (3) renal drug excretion rate
- (4) active renal secretion



96. Which of the following is characterized by presence of anisocytic stomata ?
- (1) Senna (2) Belladonna  
(3) Digitalis (4) Coca
97. One mg of Lycopodium spores used in quantitative microscopy contain an average of ..... spores.
- (1) 94,000 (2) 92,000  
(3) 90,000 (4) 9,200
98. Glass transition temperature is detected through .....
- (1) X-ray diffraction  
(2) Solution calorimetry  
(3) Thermogravimetry  
(4) Differential scanning calorimetry
99. Triterpenoids are the active constituents of .....
- (1) Jaborandi (2) Rhubarb  
(3) Stramonium (4) Brahmi
100. Which of the following HPLC detector is most sensitive to changes in temperature ?
- (1) Refractive index detector  
(2) Photo Diode Array detector  
(3) Fluorescence detector  
(4) Electrochemical detector

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**B**

**Ph.D./URS-EE-Jan-2022**

**SET-X**

**SUBJECT : Pharmaceutical Science** 10018

Sr. No. ....

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Father's Name \_\_\_\_\_

Mother's Name \_\_\_\_\_ Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

\_\_\_\_\_  
(Signature of the Invigilator)

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STARTING THE QUESTION PAPER.**

1. **All questions are compulsory.**
2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
7. Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. **Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

**PHD/URS-EE-2022/(Pharmaceutical Science)(SET-X)/(B)**

1. Which kind of molecules cannot pass through a pore transport ?
  - (1) Low Molecular weight molecules
  - (2) Water-soluble drugs
  - (3) Molecules upto 400 Dalton
  - (4) Molecules greater than 400 Dalton
2. Non-linear pharmacokinetics can also be identified as ..... pharmacokinetics.
  - (1) dose dependent
  - (2) enzyme capacity limited
  - (3) saturation
  - (4) All of the above
3. Which of the following is the characteristic of non-linear pharmacokinetics ?
  - (1) Area under the curve is proportional to the dose
  - (2) Elimination half-life remains constant
  - (3) Area under the curve is not proportional to the dose
  - (4) Amount of drug excreted through remains constant
4. The Non-linear pharmacokinetic arises due to .....
  - (1) Pathological alteration at any one of the various pharmacokinetic steps, such as absorption, distribution and/or elimination.
  - (2) Capacity-limited metabolism.
  - (3) Alteration in protein binding characteristics
  - (4) All of the above
5. Which of the following applies to non-compartmental pharmacokinetics ?
  - (1)  $MRT = AUMC/AUC$
  - (2)  $AUMC = MRT/AUC$
  - (3)  $MRT = AUC/AUMC$
  - (4)  $AUC = AUMC/MRT$



6. The Wagner-Nelson-Method in compartment modelling is employed for the determination of ..... .
- (1) absorption rate constant ( $K_a$ ) from % ARA Vs time curve
  - (2) elimination rate constant ( $K_e$ ) from % ARA Vs time curve
  - (3) absorption rate constant ( $K_a$ ) from % ARA. Vs Concentration curve
  - (4) Determination of plasma half life
7. Which of the following drug metabolism reaction is **not** conjugation ?
- (1) Glucuronidation
  - (2) Sulfate formation
  - (3) Hydrolysis
  - (4) Methylation
8. Identify the characteristic feature of colonic release systems.
- (1) They release the drug along the entire length of GIT
  - (2) They use enteric coating.
  - (3) They employ polymers that dissolve only in the alkaline pH of colon
  - (4) Both (2) and (3)
9. Anhydrous lactose offers advantage of ..... over lactose hydrate.
- (1) better flow properties
  - (2) absence of maillard reaction
  - (3) better compressibility
  - (4) none of the above
10. The B tooling and D tooling of tablet machine have different ..... .
- (1) punch and die length
  - (2) die length but same punch length
  - (3) punch and die diameter
  - (4) die diameter but same punch diameter



11. What is the term used for small molecules that bind to different regions of a binding site ?  
(1) epimers                      (2) isomers                      (3) isotopes                      (4) epitopes
12. Which of the following is **not** an endogenous lead compound ?  
(1) neurotransmitter                      (2) modulator  
(3) alkaloid                      (4) hormone
13. What bacterial enzyme aids the survival of *Helicobacter pylori* in the stomach ?  
(1) carbonic anhydrase                      (2) urease  
(3)  $\beta$ -lactamase                      (4) transpeptidase
14. What sort of receptor is the nicotinic receptor ?  
(1) A G-protein coupled receptor  
(2) A kinase linked receptor  
(3) An intracellular receptor  
(4) An ion channel
15. Which feature of acetylcholine interacts with the binding site of cholinergic receptors by hydrogen bonding ?  
(1) The acyl methyl group  
(2) The ester  
(3) The quaternary nitrogen  
(4) All three N-methyl groups
16. Which of the following needs lie on the top of the pyramid as per Maslow's hierarchy need theory ?  
(1) Physiological needs                      (2) Safety needs  
(3) Self-actualization needs                      (4) Esteem needs

17. The Theory of Leadership which states that the excellent leaders are born, not developed is :
- (1) The Trait Theory
  - (2) The Great Man Theory
  - (3) The Behavioural Theory
  - (4) The Transformational Theory
18. Which heterocyclic ring system is present in Rofecoxib ?
- (1) Furan
  - (2) Indole
  - (3) Pyridine
  - (4) Pyrrole
19. The drying process where Eutectic point is involved :
- (1) Fluid bed drying
  - (2) Tray drying
  - (3) Freeze-drying
  - (4) Both fluid bed and freeze drying
20. During distillation of mixtures of liquids, the one which evaporates first is .....
- (1) more volatile liquid
  - (2) less volatile liquid
  - (3) non-volatile liquid
  - (4) immiscible liquid
21. Identify the incorrect statement from among the following :
- (1) Aromatic compounds are Planar
  - (2) Aromatic compounds are cyclic
  - (3) Aromatic compounds have  $4n$  electrons
  - (4) Aromatic compounds are generally less reactive than similarly substituted alkenes.

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22. In electrophilic aromatic substitution reactions the halides are :
- (1) *Ortho/para* directing and activating
  - (2) *Ortho/para* directing and deactivating
  - (3) *Meta* directing and activating
  - (4) *Meta* directing and deactivating
23. A drug follow zero order degradation kinetics with rate constant  $k_0=0.70$  / day. The initial concentration of drug solution is 75 mg/ml. What would be the concentration of solution after seven days ?
- (1) 70.9 mg/ml
  - (2) 71.8 mg/ml
  - (3) 72.9 mg/ml
  - (4) 59.1 mg/ml
24. How many grams of active ingredient would be required to prepare 920 ml of 0.95% w/v solution ?
- (1) 8.74 gm
  - (2) 874 mg
  - (3) 9.5 gm
  - (4) 950 mg
25. How many grams of the zinc oxide (10%, w/v) cream, be mixed<sup>d</sup> with zinc oxide (1% w/v) cream to prepare 450 gm of zinc oxide (5% w/v) cream ?
- (1) 200 gm
  - (2) 250 gm
  - (3) 50 gm
  - (4) 150 gm
26. How many ml of alcohol would be required to prepare 750 ml of 1 in 20 solution . ?
- (1) 2 ml
  - (2) 3.75 ml
  - (3) 20 ml
  - (4) 37.5 ml
27. A pseudoplastic liquid .....
- (1) becomes less viscous as the rate of shear increases
  - (2) becomes more viscous as the rate of shear increases
  - (3) becomes less viscous over time when a constant shear stress is applied
  - (4) becomes more viscous over time when a constant shear stress is applied

28. What is the kinematic viscosity of a liquid that has a density of  $1.2 \text{ g cm}^{-3}$  and a dynamic viscosity of 2cP ?
- (1)  $0.6 \text{ m}^2 \text{ s}^{-1}$  (2)  $1.67 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$   
 (3)  $1.67 \text{ m}^2 \text{ s}^{-1}$  (4)  $0.6 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$
29. Choose the *incorrect* statement :
- (1) Different polymorphic forms of a drug can have different melting points  
 (2) Different polymorphic forms of a drug can have different molecular formulae  
 (3) Different polymorphic forms of a drug can have different solubility  
 (4) Different polymorphic forms of a drug can have different crystal habit
30. Which of the following represent the strongest intermolecular force of interaction ?
- (1) Hydrogen bond (2) Covalent bond  
 (3) London dispersion (4) Dipole-dipole interaction
31. Stomatal number is defined as average number of stomata ..... .
- (1) per leaf blade  
 (2) per  $\text{mm}^2$  area of leaf epidermis  
 (3) per  $\text{cm}^2$  area of leaf epidermis  
 (4) per  $\text{inch}^2$  area of leaf epidermis
32. Match the crude drugs with their respective trichome types.

Crude drug	Trichome types
P Cassia	I Lignified trichomes
Q Datura	II Appressed trichomes
R Stropanthus	III Multiseriate trichomes
S Nux-Vomica	IV Unicellular covering trichomes
(1) P-IV, Q-III, R-II, S-I,	(2) P-I, Q-III, R-II, S-IV
(3) P-IV, Q-I, R-II, S-III	(4) P-II, Q-I, R-IV, S-III



33. Which of the following crude drugs contain Eugenol ?  
(1) Coriander (2) Fennel  
(3) Tulsi (4) Cardamom
34. Ginkgo biloba is used for its ..... activity.  
(1) expectorant (2) lipid lowering  
(3) PAF antagonistic (4) antidepressant
35. Inulin renal clearance is used for measurement of .....  
(1) effective renal blood flow  
(2) glomerular filtration rate  
(3) renal drug excretion rate  
(4) active renal secretion
36. Which of the following is characterized by presence of anisocytic stomata ?  
(1) Senna (2) Belladonna  
(3) Digitalis (4) Coca
37. One mg of Lycopodium spores used in quantitative microscopy contain an average of ..... spores.  
(1) 94,000 (2) 92,000  
(3) 90,000 (4) 9,200
38. Glass transition temperature is detected through .....  
(1) X-ray diffraction  
(2) Solution calorimetry  
(3) Thermogravimetry  
(4) Differential scanning calorimetry

39. Triterpenoids are the active constituents of .....  
 (1) Jaborandi      (2) Rhubarb      (3) Stramonium      (4) Brahmi
40. Which of the following HPLC detector is most sensitive to changes in temperature ?  
 (1) Refractive index detector  
 (2) Photo Diode Array detector  
 (3) Fluorescence detector  
 (4) Electrochemical detector
41. The cancer cells in stage 2 .....  
 (1) have spread to other parts of the body  
 (2) may or may not have spread to lymph nodes  
 (3) have spread to the lymph nodes above collar bone  
 (4) are not spreading
42. The most common type of angina is :  
 (1) Stable angina      (2) Microvascular angina  
 (3) Variant angina      (4) Unstable angina
43. Match the following phytoconstituents with their chemical tests.
- | <b>Alkaloid</b>  | <b>Ring system</b> |
|------------------|--------------------|
| I Tropane        | P Cocaine          |
| II Indole        | Q Reserpine        |
| III Isoquinoline | R Emetine          |
| IV Diterpene     | S Aconine          |
- (1) I-S, II-P, III-Q, IV-R  
 (2) I-P, II-Q, III-R, IV-S  
 (3) I-S, II-P, III-R, IV-Q  
 (4) I-S, II-R, III-P, IV-Q

44. Match the following diuretics with their appropriate category.

Diuretic	Category
P Furosemide	I Carbonic anhydrase inhibitor
Q Spironolactone	II Phenoxyacetic acid derivative
R Ethacrynic acid	III Potassium sparing
S Acetazolamide	IV Sulphamoyl derivative
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-IV, Q-I, R-II, S-III	
(4) P-IV, Q-II, R-I, S-III	

45. Which of the following drugs can antagonise 5-HT ?

- |                 |                      |
|-----------------|----------------------|
| (1) Cinnarizine | (2) Cyproheptadine   |
| (3) Ondansetron | (4) All of the above |

46. Which of the following antidiabetic agent can cause lactic acidosis ?

- |                    |                |
|--------------------|----------------|
| (1) Chlorpropamide | (2) Phenformin |
| (3) Glipizide      | (4) Metformin  |

47. Which of the following is a preferred drug for the management of osteoporosis caused by high-dose use of glucocorticoids ?

- |                 |                |
|-----------------|----------------|
| (1) Alendronate | (2) Calcitonin |
| (3) Mestranol   | (4) Vitamin D  |

48. Identify the potassium channel opener from among the following :

- |                   |                 |
|-------------------|-----------------|
| (1) Pinacidil     | (2) Hydralazine |
| (3) Glibenclamide | (4) Amiloride   |

49. Metronidazole is least likely to be effective in the treatment of :
- (1) Amebiasis
  - (2) Giardiasis
  - (3) Pseudomembranous colitis
  - (4) Pneumocystosis
50. Identify the drug whose concurrent use is likely to cause failure of oral contraception :
- (1) Isoniazid
  - (2) Rifampicin
  - (3) Cimetidine
  - (4) Propranolol
51. Which of the following states that the rate of heat flow through a uniform material is directly proportional to the area and temperature gradient, while inversely proportional to the length of the path of flow :
- (1) Rittinger's Law
  - (2) Zeroth Law
  - (3) Fourier Law
  - (4) Fick's Law
52. A powder is called the coarse powder if all the particles pass through a sieve with nominal mesh aperture of ..... and not more than 40% by weight through a sieve with nominal mesh aperture of ..... .
- (1) 710  $\mu\text{m}$ , 250  $\mu\text{m}$
  - (2) 350  $\mu\text{m}$ , 180  $\mu\text{m}$
  - (3) 180  $\mu\text{m}$ , 125  $\mu\text{m}$
  - (4) 1700  $\mu\text{m}$ , 355  $\mu\text{m}$
53. What is observed during mixing of solids in V-Cone Blender, if the speed kept to high speed ?
- (1) Segregation
  - (2) Sedimentation
  - (3) Uniform dispersion
  - (4) None of these



54. Corrosion of metals is fairly high in one of the following medium :
- |             |                 |
|-------------|-----------------|
| (1) Acidic  | (2) Alkaline    |
| (3) Neutral | (4) Non-Aqueous |
55. The list of authoritative books of Ayurvedic, Sidhha and Unani Tibb system is given in ..... of the Drugs and Cosmetics Act 1940.
- |                             |                    |
|-----------------------------|--------------------|
| (1) Schedule T              | (2) First Schedule |
| (3) Schedule M <sub>1</sub> | (4) Schedule P     |
56. .... deals with the list of drugs exempted from certain provisions governing manufacture and sale of drugs.
- |                |                |
|----------------|----------------|
| (1) Schedule K | (2) Schedule D |
| (3) Schedule X | (4) Schedule P |
57. The label on containers for drugs for internal use, listed in Schedule X must contain the following information :
- (1) Symbol XR<sub>x</sub> in red letters on the top left corner
  - (2) Manufacturing licence No.
  - (3) Warning : To be sold by retail on the prescription of Registered Medical practitioner only
  - (4) All of these
58. Which type of the bond geometry is associated with the complexes having coordination number 4 ?
- |                   |              |
|-------------------|--------------|
| (1) Tetrahedral   | (2) Trigonal |
| (3) Square planar | (4) Linear   |

59. Identify the derived property of powders :

- |                       |                |
|-----------------------|----------------|
| (1) Surface area      | (2) Solubility |
| (3) Size distribution | (4) Porosity   |

60. Which of the following statement is NOT TRUE for Passive diffusion ?

- (1) It can be explained by Fick's Law
- (2) It is an energy independent process
- (3) Drugs moves against the concentration gradient
- (4) It is non saturable process

61. Match the drugs with their mechanism of action.

Drug	Mechanism
P Methotrexate	I Competitive inhibition of PABA uptake
Q Para Aminosalicylic acid	II Nucleic acid binding to viral enzymes
R Acyclovir	III Inhibition of dihydrofolate reductase
S Rifampicin	IV Inhibition of DNA dependent RNA polymerase

- (1) P-IV, Q-III, R-II, S-I,
- (2) P-I, Q-III, R-II, S-IV
- (3) P-IV, Q-II, R-III, S-I
- (4) P-III, Q-I, R-II, S-IV

62. Which of the following is GABAB agonist ?

- |                |                 |
|----------------|-----------------|
| (1) Muscimol   | (2) Baclofen    |
| (3) Picrotoxin | (4) Bicuculline |

63. Which of the following drug is used clinically for enuresis and chronic pain ?  
(1) Bupropion (2) Fluvoxamine  
(3) Imipramine (4) Phenelzine
64. Which of the following is used in methanol poisoning ?  
(1) Ethanol (2) Naltrexone  
(3) Disulfiram (4) None of the above
65. Which of the following is inverse agonist of benzodiazepine receptors ?  
(1) Flumazenil (2)  $\beta$ -Carbolines  
(3) Chlordiazepoxide (4) Glutethimide
66. In which of the following types of seizures Phenytoin is ineffective ?  
(1) Generalized tonic-clonic (2) Simple partial  
(3) Complex partial (4) Absence
67. Fluoxetine blocks the transport of .....  
(1) Serotonin (2) Norepinephrine  
(3) Dopamine (4) GABA
68. Which of the following is true for Isoniazid ?  
(1) It requires pyridoxine supplementation  
(2) It may discolor the tears, saliva, urine or feces orange-red  
(3) It causes ocular complications that are reversible if the drug is discontinued  
(4) It may be ototoxic and nephrotoxic

69. Match the followings :

Vitamin	Chemical name
P Vitamin B1	I Riboflavin
Q Vitamin B2	II Thiamine
R Vitamin B6	III Hydroxycobalamine
S Vitamin B12	IV Pyridoxine

(1) P-IV, Q-III, R-II, S-I,  
 (2) P-I, Q-III, R-II, S-IV  
 (3) P-IV, Q-I, R-II, S-III  
 (4) P-II, Q-I, R-IV, S-III

70. Match the crude drugs with their chemical tests.

Drug	Chemical Test
P Senna	I Meconic acid test
Q Digitalis	II Borntrager test
R Opium	III Fluorescence test
S Ergot	IV Keller-Killiani test

(1) P-IV, Q-III, R-II, S-I,  
 (2) P-I, Q-III, R-II, S-IV  
 (3) P-II, Q-IV, R-I, S-III  
 (4) P-II, Q-I, R-IV, S-III

71. The C-24 glycosides give the following test positive :

- (1) Liberman's sterol test  
 (2) Baljet test  
 (3) Legal test  
 (4) All of the above

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72. The IR spectrum of the organic liquid can be taken up by placing it between a pair of polished plate made of :  
(1) Sodium chloride  
(2) Potassium bromide  
(3) Aluminium chloride  
(4) Both (1) and (2)
73. Which of the following cannot be used as reference electrode ?  
(1) Calomel electrode  
(2) Glass electrode  
(3) Silver/silver chloride electrode  
(4) Standard Hydrogen electrode
74. Which of the following act as precursors for the biosynthesis of Atropine?  
(1) Ornithine and Phenylalanine                      (2) Tyrosine and Tryptophan  
(3) Tyrosine and Dopamine                            (4) Tryptophan and Dopamine
75. The biological source of Star Anise is :  
(1) *Pimpinella anisum*                                      (2) *Illicium anisum*  
(3) *Illicium verum*    (4) *Illicium religiosum*
76. Peruovoside is naturally obtained from the following :  
(1) Dioscorea    (2) Ginseng  
(3) Liquorice    (4) Thevetia
77. Sapogenins are characterized by .....  
(1) Spiroketal side chain                                      (2) 27 cholestane system  
(3) Spirostane structure                                      (4) all of the above

78. Steroidal estrogens are produced semi-synthetically from the following plant sterol.
- |               |                |
|---------------|----------------|
| (1) Gitogenin | (2) Diosgenin  |
| (3) Ditogenin | (4) Estrogenin |
79. All are phytoestrogens except :
- |                 |                         |
|-----------------|-------------------------|
| (1) Genistein   | (2) Daidzein            |
| (3) Coumesterol | (4) Diethylstilbesterol |
80. Shinoda test is used for chemical evaluation of .....
- |                    |                |
|--------------------|----------------|
| (1) Alkaloids      | (2) Flavanoids |
| (3) Anthraquinones | (4) Lipids     |
81. Diamorphine differs from morphine by the presence of :
- |                       |                       |
|-----------------------|-----------------------|
| (1) two methyl groups | (2) two acetyl groups |
| (3) one acetyl group  | (4) one methyl group  |
82. Esomeprazole is the ..... of omeprazole.
- |                    |                     |
|--------------------|---------------------|
| (1) (S)-enantiomer | (2) (R)-enantiomer  |
| (3) E-isomer       | (4) racemic mixture |
83. Which of the following is the most appropriate parameters for qualitative identification of substances in chromatography ?
- |                    |                               |
|--------------------|-------------------------------|
| (1) Retention time | (2) Resolution factor         |
| (3) HETP           | (4) Relative retention factor |
84. Which of the following carbonyl compound reacts violently with water ?
- |                       |                   |
|-----------------------|-------------------|
| (1) Ethanal           | (2) Ethanoic acid |
| (3) Ethanoyl chloride | (4) Butan-2-one   |

85. The reaction of conversion of an aldehyde to alcohol is ..... .  
(1) Oxidation (2) Polymerization  
(3) Reduction (4) Esterification
86. Which one of the following compounds does not absorb light in the UV-Vis spectrum ?  
(1) Paracetamol (2) Diclofenac  
(3) Curcumin (4) Chloral hydrate
87. The primary site for amino acid catabolism is ..... .  
(1) Kidney (2) Liver  
(3) Brain (4) Adipose tissue
88. The tertiary structure of protein refers to :  
(1) the overall 3D shape  
(2) the sequence of amino acids  
(3) the sequence of nucleotides  
(4) the arrangement of subunits
89. Identify the **correct** statement for glycolysis :  
(1) The gluconeogenesis is the exact opposite of glycolysis.  
(2) In glycolysis, the glucose is formed from pyruvate.  
(3) Glycolysis can take place under anaerobic conditions.  
(4) The mitochondria is the primary site of glycolysis.
90. What is the term used for drugs that are similar in structure to a known drug and which are used for the same purpose ?  
(1) copycat' drugs (2) 'me-too' drugs  
(3) derivative' drugs (4) 'analogue' drugs

91. Which of the following describes salbutamol, a  $\beta_2$ -adrenoceptor agonists ?
- (1) Direct acting sympathomimetic
  - (2) Indirect acting sympathomimetic
  - (3) Direct acting parasympathomimetic
  - (4) Indirect acting parasympathomimetic
92. Which of the following physiological processes are **not** parts of the 'fight and flight' response of the body ?
- (1) Vasodilatation in skeletal muscle
  - (2) Increased gut motility
  - (3) Bladder relaxation
  - (4) Sweating
93. Where is the hormone erythropoietin produced in the body ?
- (1) Spleen
  - (2) Liver
  - (3) Thyroid
  - (4) Kidney
94. Partial agonists are molecules that .....
- (1) can always cause a maximal response irrespective of the presence of antagonists.
  - (2) have affinity toward the target receptor but no efficacy.
  - (3) have affinity and efficacy toward the target receptor.
  - (4) have an agonistic effect on the receptor, but only ever achieve a submaximal response
95. Which of the following statement is **correct** for bioavailability ?
- (1) Bioavailability describes the proportion of the drug administered that is metabolised very quickly and thus is not available to induce a physiological effect.
  - (2) Bioavailability describes the ability of the administered drug metabolites to cause undesirable physiological effects.
  - (3) Bioavailability is used to describe the fraction of the dose of drug administered that is present within the body and facilitates the desired physiological effects.
  - (4) Bioavailability is the length of time an administered drug is present in the body and thus is available to cause a physiological effect.



96. Microorganisms on culturing in nutrient broth show growth at different locations in the test tube. Match the location of growth with the characteristics of microbes.

**Growth location**

- I Bottom of the test tube
- II Whole of the test tube
- III Top of the test tube
- IV Slightly below the top of the test tube

**Microbial characteristics**

- P Facultative anaerobe
- Q Obligate aerobes
- R Microaerophile
- S Obligate anaerobes

- (1) I-S, II-P, III-Q, IV-R
- (2) I-P, II-Q, III-R, IV-S
- (3) I-S, II-P, III-R, IV-Q
- (4) I-S, II-R, III-P, IV-Q

97. Match the following drugs with their therapeutic category.

**Drugs**

- I Alogliptin
- II Bedaquiline
- III Roflumilast
- IV Pasireotide

**Therapeutic Indications**

- P MDR-Tuberculosis
- Q Cushing's disease
- R Chronic obstructive pulmonary disease
- S Type 2 Diabetes mellitus

- (1) I-S, II-P, III-Q, IV-R
- (2) I-P, II-Q, III-R, IV-S
- (3) I-S, II-P, III-R, IV-Q
- (4) I-S, II-R, III-P, IV-Q

98. Match the following NSAIDs with their chemical class :

NSAIDs	Chemical class
I Indomethacin	P Propionic acid derivative
II Ibuprofen	Q Pyrrolo-pyrrole derivative
III Diclofenac	R Indole derivative
IV Ketorolac	S Arylacetic acid derivative
(1) I-R, II-P, III-S, IV-Q	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

99. In which of the following conditions Ketoacidosis is **not** present :

- |                       |                        |
|-----------------------|------------------------|
| (1) Diabetes mellitus | (2) Starvation         |
| (3) Dehydration       | (4) Diabetes insipidus |

100. Which of the following are **not** the signs of inflammation ?

- |              |            |
|--------------|------------|
| (1) Swelling | (2) Pallor |
| (3) Redness  | (4) Pain   |

Total No. of Printed Pages : 21

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C

Ph.D./URS-EE-Jan-2022

SET-X

SUBJECT : Pharmaceutical Science 10011

Sr. No. ....

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Father's Name \_\_\_\_\_

Mother's Name \_\_\_\_\_ Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

\_\_\_\_\_  
(Signature of the Invigilator)

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4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
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PHD/URS-EE-2022/(Pharmaceutical Science)(SET-X)/(C)

1. Diamorphine differs from morphine by the presence of :  
(1) two methyl groups (2) two acetyl groups  
(3) one acetyl group (4) one methyl group
2. Esomeprazole is the ..... of omeprazole.  
(1) (S)-enantiomer (2) (R)-enantiomer  
(3) E-isomer (4) racemic mixture
3. Which of the following is the most appropriate parameters for qualitative identification of substances in chromatography ?  
(1) Retention time (2) Resolution factor  
(3) HETP (4) Relative retention factor
4. Which of the following carbenyl compound reacts violently with water ?  
(1) Ethanal (2) Ethanoic acid  
(3) Ethanoyl chloride (4) Butan-2-one
5. The reaction of conversion of an aldehyde to alcohol is .....  
(1) Oxidation (2) Polymerization  
(3) Reduction (4) Esterification
6. Which one of the following compounds does not absorb light in the UV-Vis spectrum ?  
(1) Paracetamol (2) Diclofenac  
(3) Curcumin (4) Chloral hydrate
7. The primary site for amino acid catabolism is .....  
(1) Kidney (2) Liver  
(3) Brain (4) Adipose tissue



8. The tertiary structure of protein refers to :
- (1) the overall 3D shape
  - (2) the sequence of amino acids
  - (3) the sequence of nucleotides
  - (4) the arrangement of subunits
9. Identify the **correct** statement for glycolysis :
- (1) The gluconeogenesis is the exact opposite of glycolysis.
  - (2) In glycolysis, the glucose is formed from pyruvate.
  - (3) Glycolysis can take place under anaerobic conditions.
  - (4) The mitochondria is the primary site of glycolysis.
10. What is the term used for drugs that are similar in structure to a known drug and which are used for the same purpose ?
- (1) copycat' drugs
  - (2) 'me-too' drugs
  - (3) derivative' drugs
  - (4) 'analogue' drugs
11. Stomatal number is defined as average number of stomata .....
- (1) per leaf blade
  - (2) per  $\text{mm}^2$  area of leaf epidermis
  - (3) per  $\text{cm}^2$  area of leaf epidermis
  - (4) per  $\text{inch}^2$  area of leaf epidermis
12. Match the crude drugs with their respective trichome types.

Crude drug	Trichome types
P Cassia	I Lignified trichomes
Q Datura	II Appressed trichomes
R Stropanthus	III Multiseriate trichomes
S Nux-Vomica	IV Unicellular covering trichomes
(1) P-IV, Q-III, R-II, S-I,	(2) P-I, Q-III, R-II, S-IV
(3) P-IV, Q-I, R-II, S-III	(4) P-II, Q-I, R-IV, S-III

13. Which of the following crude drugs contain Eugenol ?  
(1) Coriander (2) Fennel  
(3) Tulsi (4) Cardamom
14. Ginkgo biloba is used for its ..... activity.  
(1) expectorant (2) lipid lowering  
(3) PAF antagonistic (4) antidepressant
15. Inulin renal clearance is used for measurement of .....  
(1) effective renal blood flow  
(2) glomerular filtration rate  
(3) renal drug excretion rate  
(4) active renal secretion
16. Which of the following is characterized by presence of anisocytic stomata ?  
(1) Senna (2) Belladonna  
(3) Digitalis (4) Coca
17. One mg of Lycopodium spores used in quantitative microscopy contain an average of ..... spores.  
(1) 94,000 (2) 92,000  
(3) 90,000 (4) 9,200
18. Glass transition temperature is detected through .....  
(1) X-ray diffraction  
(2) Solution calorimetry  
(3) Thermogravimetry  
(4) Differential scanning calorimetry

19. Triterpenoids are the active constituents of .....

- |                |             |
|----------------|-------------|
| (1) Jaborandi  | (2) Rhubarb |
| (3) Stramonium | (4) Brahmi  |

20. Which of the following HPLC detector is most sensitive to changes in temperature ?

- (1) Refractive index detector
- (2) Photo Diode Array detector
- (3) Fluorescence detector
- (4) Electrochemical detector

21. Match the drugs with their mechanism of action.

Drug	Mechanism
P Methotrexate	I Competitive inhibition of PABA uptake
Q Para Aminosalicylic acid	II Nucleic acid binding to viral enzymes
R Acyclovir	III Inhibition of dihydrofolate reductase
S Rifampicin	IV Inhibition of DNA dependent RNA polymerase

(1) P-IV, Q-III, R-II, S-I

(2) P-I, Q-III, R-II, S-IV

(3) P-IV, Q-II, R-III, S-I

(4) P-III, Q-I, R-II, S-IV

22. Which of the following is GABAB agonist ?

- |                |                 |
|----------------|-----------------|
| (1) Muscimol   | (2) Baclofen    |
| (3) Picrotoxin | (4) Bicuculline |

23. Which of the following drug is used clinically for enuresis and chronic pain ?  
(1) Bupropion (2) Fluvoxamine  
(3) Imipramine (4) Phenelzine
24. Which of the following is used in methanol poisoning ?  
(1) Ethanol (2) Naltrexone  
(3) Disulfiram (4) None of the above
25. Which of the following is inverse agonist of benzodiazepine receptors ?  
(1) Flumazenil (2)  $\beta$ -Carbolines  
(3) Chlordiazepoxide (4) Glutethimide
26. In which of the following types of seizures Phenytoin is ineffective ?  
(1) Generalized tonic-clonic (2) Simple partial  
(3) Complex partial (4) Absence
27. Fluoxetine blocks the transport of .....  
(1) Serotonin (2) Norepinephrine  
(3) Dopamine (4) GABA
28. Which of the following is true for Isoniazid ?  
(1) It requires pyridoxine supplementation  
(2) It may discolor the tears, saliva, urine or feces orange-red  
(3) It causes ocular complications that are reversible if the drug is discontinued  
(4) It may be ototoxic and nephrotoxic



29. Match the followings :

Vitamin	Chemical name
P Vitamin B1	I Riboflavin
Q Vitamin B2	II Thiamine
R Vitamin B6	III Hydroxycobalamine
S Vitamin B12	IV Pyridoxine
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-IV, Q-I, R-II, S-III	
(4) P-II, Q-I, R-IV, S-III	

30. Match the crude drugs with their chemical tests.

Drug	Chemical Test
P Senna	I Meconic acid test
Q Digitalis	II Borntrager test
R Opium	III Fluorescence test
S Ergot	IV Keller-Killiani test
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-II, Q-IV, R-I, S-III	
(4) P-II, Q-I, R-IV, S-III	

31. Which of the following describes salbutamol, a  $\beta_2$ -adrenoceptor agonists ?

- (1) Direct acting sympathomimetic
- (2) Indirect acting sympathomimetic
- (3) Direct acting parasympathomimetic
- (4) Indirect acting parasympathomimetic

32. Which of the following physiological processes are **not** parts of the 'fight and flight' response of the body ?
- (1) Vasodilatation in skeletal muscle
  - (2) Increased gut motility
  - (3) Bladder relaxation
  - (4) Sweating
33. Where is the hormone erythropoietin produced in the body ?
- (1) Spleen
  - (2) Liver
  - (3) Thyroid
  - (4) Kidney
34. Partial agonists are molecules that .....
- (1) can always cause a maximal response irrespective of the presence of antagonists.
  - (2) have affinity toward the target receptor but no efficacy.
  - (3) have affinity and efficacy toward the target receptor.
  - (4) have an agonistic effect on the receptor, but only ever achieve a submaximal response
35. Which of the following statement is **correct** for bioavailability ?
- (1) Bioavailability describes the proportion of the drug administered that is metabolised very quickly and thus is not available to induce a physiological effect.
  - (2) Bioavailability describes the ability of the administered drug metabolites to cause undesirable physiological effects.
  - (3) Bioavailability is used to describe the fraction of the dose of drug administered that is present within the body and facilitates the desired physiological effects.
  - (4) Bioavailability is the length of time an administered drug is present in the body and thus is available to cause a physiological effect.

36. Microorganisms on culturing in nutrient broth show growth at different locations in the test tube. Match the location of growth with the characteristics of microbes.

Growth location	Microbial characteristics
I Bottom of the test tube	P Facultative anaerobe
II Whole of the test tube	Q Obligate aerobes
III Top of the test tube	R Microaerophile
IV Slightly below the top of the test tube	S Obligate anaerobes

(1) I-S, II-P, III-Q, IV-R  
 (2) I-P, II-Q, III-R, IV-S  
 (3) I-S, II-P, III-R, IV-Q  
 (4) I-S, II-R, III-P, IV-Q

37. Match the following drugs with their therapeutic category.

Drugs	Therapeutic Indications
I Alogliptin	P MDR-Tuberculosis
II Bedaquiline	Q Cushing's disease
III Roflumilast	R Chronic obstructive pulmonary disease
IV Pasireotide	S Type 2 Diabetes mellitus

(1) I-S, II-P, III-Q, IV-R  
 (2) I-P, II-Q, III-R, IV-S  
 (3) I-S, II-P, III-R, IV-Q  
 (4) I-S, II-R, III-P, IV-Q

38. Match the following NSAIDs with their chemical class :

NSAIDs	Chemical class
I Indomethacin	P Propionic acid derivative
II Ibuprofen	Q Pyrrolo-pyrrole derivative
III Diclofenac	R Indole derivative
IV Ketorolac	S Arylacetic acid derivative
(1) I-R, II-P, III-S, IV-Q	(2) I-P, II-Q, III-R, IV-S
(3) I-S, II-P, III-R, IV-Q	(4) I-S, II-R, III-P, IV-Q

39. In which of the following conditions Ketoacidosis is **not** present :

- |                       |                        |
|-----------------------|------------------------|
| (1) Diabetes mellitus | (2) Starvation         |
| (3) Dehydration       | (4) Diabetes insipidus |

40. Which of the following are **not** the signs of inflammation ?

- |              |            |             |          |
|--------------|------------|-------------|----------|
| (1) Swelling | (2) Pallor | (3) Redness | (4) Pain |
|--------------|------------|-------------|----------|

41. Which of the following states that the rate of heat flow through a uniform material is directly proportional to the area and temperature gradient, while inversely proportional to the length of the path of flow :

- |                     |                |
|---------------------|----------------|
| (1) Rittinger's Law | (2) Zeroth Law |
| (3) Fourier Law     | (4) Fick's Law |

42. A powder is called the coarse powder if all the particles pass through a sieve with nominal mesh aperture of ..... and not more than 40% by weight through a sieve with nominal mesh aperture of .....

- |   |  |
|---|--|
| (1) 710 $\mu\text{m}$ , 250 $\mu\text{m}$ | (2) 350 $\mu\text{m}$ , 180 $\mu\text{m}$  |
| (3) 180 $\mu\text{m}$ , 125 $\mu\text{m}$ | (4) 1700 $\mu\text{m}$ , 355 $\mu\text{m}$ |



43. What is observed during mixing of solids in V-Cone Blender, if the speed kept to high speed ?
- (1) Segregation (2) Sedimentation  
(3) Uniform dispersion (4) None of these
44. Corrosion of metals is fairly high in one of the following medium :
- (1) Acidic (2) Alkaline  
(3) Neutral (4) Non-Aqueous
45. The list of authoritative books of Ayurvedic, Sidhha and Unani Tibb system is given in ..... of the Drugs and Cosmetics Act 1940.
- (1) Schedule T (2) First Schedule  
(3) Schedule M<sub>1</sub> (4) Schedule P
46. .... deals with the list of drugs exempted from certain provisions governing manufacture and sale of drugs.
- (1) Schedule K (2) Schedule D (3) Schedule X (4) Schedule P
47. The label on containers for drugs for internal use, listed in Schedule X must contain the following information :
- (1) Symbol XR<sub>x</sub> in red letters on the top left corner  
(2) Manufacturing licence No.  
(3) Warning : To be sold by retail on the prescription of Registered Medical practitioner only  
(4) All of these
48. Which type of the bond geometry is associated with the complexes having coordination number 4 ?
- (1) Tetrahedral (2) Trigonal (3) Square planar (4) Linear

49. Identify the derived property of powders :
- |                       |                |
|-----------------------|----------------|
| (1) Surface area      | (2) Solubility |
| (3) Size distribution | (4) Porosity   |
50. Which of the following statement is NOT TRUE for Passive diffusion ?
- (1) It can be explained by Fick's Law  
(2) It is an energy independent process  
(3) Drugs moves against the concentration gradient  
(4) It is non saturable process
51. What is the term used for small molecules that bind to different regions of a binding site ?
- |              |              |
|--------------|--------------|
| (1) epimers  | (2) isomers  |
| (3) isotopes | (4) epitopes |
52. Which of the following is **not** an endogenous lead compound ?
- |                      |               |
|----------------------|---------------|
| (1) neurotransmitter | (2) modulator |
| (3) alkaloid         | (4) hormone   |
53. What bacterial enzyme aids the survival of *Helicobacter pylori* in the stomach ?
- |                        |                    |
|------------------------|--------------------|
| (1) carbonic anhydrase | (2) urease         |
| (3) $\beta$ -lactamase | (4) transpeptidase |
54. What sort of receptor is the nicotinic receptor ?
- (1) A G-protein coupled receptor  
(2) A kinase linked receptor  
(3) An intracellular receptor  
(4) An ion channel

55. Which feature of acetylcholine interacts with the binding site of cholinergic receptors by hydrogen bonding ?
- (1) The acyl methyl group
  - (2) The ester
  - (3) The quaternary nitrogen
  - (4) All three N-methyl groups
56. Which of the following needs lie on the top of the pyramid as per Maslow's hierarchy need theory ?
- (1) Physiological needs
  - (2) Safety needs
  - (3) Self-actualization needs
  - (4) Esteem needs
57. The Theory of Leadership which states that the excellent leaders are born, not developed is :
- (1) The Trait Theory
  - (2) The Great Man Theory
  - (3) The Behavioural Theory
  - (4) The Transformational Theory
58. Which heterocyclic ring system is present in Rofecoxib ?
- (1) Furan
  - (2) Indole
  - (3) Pyridine
  - (4) Pyrrole
59. The drying process where Eutectic point is involved :
- (1) Fluid bed drying
  - (2) Tray drying
  - (3) Freeze-drying
  - (4) Both fluid bed and freeze drying

60. During distillation of mixtures of liquids, the one which evaporates first is .....  
(1) more volatile liquid (2) less volatile liquid  
(3) non-volatile liquid (4) immiscible liquid
61. Which kind of molecules cannot pass through a pore transport ?  
(1) Low Molecular weight molecules  
(2) Water-soluble drugs  
(3) Molecules upto 400 Dalton  
(4) Molecules greater than 400 Dalton
62. Non-linear pharmacokinetics can also be identified as ..... pharmacokinetics.  
(1) dose dependent (2) enzyme capacity limited  
(3) saturation (4) All of the above
63. Which of the following is the characteristic of non-linear pharmacokinetics ?  
(1) Area under the curve is proportional to the dose  
(2) Elimination half-life remains constant  
(3) Area under the curve is not proportional to the dose  
(4) Amount of drug excreted through remains constant
64. The Non-linear pharmacokinetic arises due to .....  
(1) Pathological alteration at any one of the various pharmacokinetic steps, such as absorption, distribution and/or elimination.  
(2) Capacity-limited metabolism.  
(3) Alteration in protein binding characteristics  
(4) All of the above



65. Which of the following applies to non-compartmental pharmacokinetics ?
- (1)  $MRT = AUMC/AUC$
  - (2)  $AUMC = MRT/AUC$
  - (3)  $MRT = AUC/AUMC$
  - (4)  $AUC = AUMC/MRT$
66. The Wagner-Nelson-Method in compartment modelling is employed for the determination of .....
- (1) absorption rate constant ( $K_a$ ) from % ARA Vs time curve
  - (2) elimination rate constant ( $K_e$ ) from % ARA Vs time curve
  - (3) absorption rate constant ( $K_a$ ) from % ARA. Vs Concentration curve
  - (4) Determination of plasma half life
67. Which of the following drug metabolism reaction is **not** conjugation ?
- (1) Glucuronidation
  - (2) Sulfate formation
  - (3) Hydrolysis
  - (4) Methylation
68. Identify the characteristic feature of colonic release systems.
- (1) They release the drug along the entire length of GIT
  - (2) They use enteric coating.
  - (3) They employ polymers that dissolve only in the alkaline pH of colon
  - (4) Both (2) and (3)
69. Anhydrous lactose offers advantage of ..... over lactose hydrate.
- (1) better flow properties
  - (2) absence of maillard reaction
  - (3) better compressibility
  - (4) none of the above

70. The B tooling and D tooling of tablet machine have different .....

- (1) punch and die length
- (2) die length but same punch length
- (3) punch and die diameter
- (4) die diameter but same punch diameter

71. The cancer cells in stage 2 .....

- (1) have spread to other parts of the body
- (2) may or may not have spread to lymph nodes
- (3) have spread to the lymph nodes above collar bone
- (4) are not spreading

72. The most common type of angina is :

- (1) Stable angina
- (2) Microvascular angina
- (3) Variant angina
- (4) Unstable angina

73. Match the following phytoconstituents with their chemical tests.

Alkaloid	Ring system
I Tropane	P Cocaine
II Indole	Q Reserpine
III Isoquinoline	R Emetine
IV Diterpene	S Aconine
(1) I-S, II-P, III-Q, IV-R	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

74. Match the following diuretics with their appropriate category.

Diuretic	Category
P Furosemide	I Carbonic anhydrase inhibitor
Q Spironolactone	II Phenoxyacetic acid derivative
R Ethacrynic acid	III Potassium sparing
S Acetazolamide	IV Sulphamoyl derivative

(1) P-IV, Q-III, R-II, S-I,

(2) P-I, Q-III, R-II, S-IV

(3) P-IV, Q-I, R-II, S-III

(4) P-IV, Q-II, R-I, S-III

75. Which of the following drugs can antagonise 5-HT ?

(1) Cinnarizine

(2) Cyproheptadine

(3) Ondansetron

(4) All of the above

76. Which of the following antidiabetic agent can cause lactic acidosis ?

(1) Chlorpropamide

(2) Phenformin

(3) Glipizide

(4) Metformin

77. Which of the following is a preferred drug for the management of osteoporosis caused by high-dose use of glucocorticoids ?

(1) Alendronate

(2) Calcitonin

(3) Mestranol

(4) Vitamin D

78. Identify the potassium channel opener from among the following :

(1) Pinacidil

(2) Hydralazine

(3) Glibenclamide

(4) Amiloride

**PHD/URS-EE-2022/(Pharmaceutical Science)(SET-X)/(C)**

79. Metronidazole is least likely to be effective in the treatment of :
- (1) Amebiasis
  - (2) Giardiasis
  - (3) Pseudomembranous colitis
  - (4) Pneumocystosis
80. Identify the drug whose concurrent use is likely to cause failure of oral contraception :
- (1) Isoniazid
  - (2) Rifampicin
  - (3) Cimetidine
  - (4) Propranolol
81. Identify the incorrect statement from among the following :
- (1) Aromatic compounds are Planar
  - (2) Aromatic compounds are cyclic
  - (3) Aromatic compounds have  $4n$  electrons
  - (4) Aromatic compounds are generally less reactive than similarly substituted alkenes.
82. In electrophilic aromatic substitution reactions the halides are :
- (1) *Ortho/para* directing and activating
  - (2) *Ortho/para* directing and deactivating
  - (3) *Meta* directing and activating
  - (4) *Meta* directing and deactivating
83. A drug follow zero order degradation kinetics with rate constant  $k_0 = 0.70$  / day. The initial concentration of drug solution is 75 mg/ml. What would be the concentration of solution after seven days ?
- (1) 70.9 mg/ml
  - (2) 71.8 mg/ml
  - (3) 72.9 mg/ml
  - (4) 69.1 mg/ml



84. How many grams of active ingredient would be required to prepare 920 ml of 0.95% w/v solution ?  
(1) 8.74 gm                      (2) 874 mg                      (3) 9.5 gm                      (4) 950 mg
85. How many grams of the zinc oxide (10%, w/v) cream, be mixed with zinc oxide (1% w/v) cream to prepare 450 gm of zinc oxide (5% w/v) cream ?  
(1) 200 gm                      (2) 250 gm                      (3) 50 gm                      (4) 150 gm
86. How many ml of alcohol would be required to prepare 750 ml of 1 in 20 solution ?  
(1) 2 ml                      (2) 3.75 ml                      (3) 20 ml                      (4) 37.5 ml
87. A pseudoplastic liquid .....  
(1) becomes less viscous as the rate of shear increases  
(2) becomes more viscous as the rate of shear increases  
(3) becomes less viscous over time when a constant shear stress is applied  
(4) becomes more viscous over time when a constant shear stress is applied
88. What is the kinematic viscosity of a liquid that has a density of  $1.2 \text{ g cm}^{-3}$  and a dynamic viscosity of 2cP ?  
(1)  $0.6 \text{ m}^2 \text{ s}^{-1}$                       (2)  $1.67 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$   
(3)  $1.67 \text{ m}^2 \text{ s}^{-1}$                       (4)  $0.6 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$
89. Choose the **incorrect** statement :  
(1) Different polymorphic forms of a drug can have different melting points  
(2) Different polymorphic forms of a drug can have different molecular formulae  
(3) Different polymorphic forms of a drug can have different solubility  
(4) Different polymorphic forms of a drug can have different crystal habit

90. Which of the following represent the strongest intermolecular force of interaction ?  
(1) Hydrogen bond (2) Covalent bond  
(3) London dispersion (4) Dipole-dipole interaction
91. The C-24 glycosides give the following test positive :  
(1) Liberman's sterol test (2) Baljet test  
(3) Legal test (4) All of the above
92. The IR spectrum of the organic liquid can be taken up by placing it between a pair of polished plate made of :  
(1) Sodium chloride  
(2) Potassium bromide  
(3) Aluminium chloride  
(4) Both (1) and (2)
93. Which of the following cannot be used as reference electrode ?  
(1) Calomel electrode  
(2) Glass electrode  
(3) Silver/silver chloride electrode  
(4) Standard Hydrogen electrode
94. Which of the following act as precursors for the biosynthesis of Atropine?  
(1) Ornithine and Phenylalanine (2) Tyrosine and Tryptophan  
(3) Tyrosine and Dopamine (4) Tryptophan and Dopamine
95. The biological source of Star Anise is :  
(1) *Pimpinella anisum* (2) *Illicium anisum*  
(3) *Illicium verum* (4) *Illicium religiosum*



96. Peruvidoside is naturally obtained from the following :
- |               |              |
|---------------|--------------|
| (1) Dioscorea | (2) Ginseng  |
| (3) Liquorice | (4) Thevetia |
97. Sapogenins are characterized by .....
- |                           |                          |
|---------------------------|--------------------------|
| (1) Spiroketal side chain | (2) 27 cholestane system |
| (3) Spirostane structure  | (4) all of the above     |
98. Steroidal estrogens are produced semi-synthetically from the following plant sterol.
- |               |                |
|---------------|----------------|
| (1) Gitogenin | (2) Diosgenin  |
| (3) Ditogenin | (4) Estrogenin |
99. All are phytoestrogens except :
- |                 |                         |
|-----------------|-------------------------|
| (1) Genistein   | (2) Daidzein            |
| (3) Coumesterol | (4) Diethylstilbesterol |
100. Shinoda test is used for chemical evaluation of .....
- |                    |                |
|--------------------|----------------|
| (1) Alkaloids      | (2) Flavanoids |
| (3) Anthraquinones | (4) Lipids     |



Total No. of Printed Pages : 21

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D

Ph.D./URS-EE-Jan-2022

SET-X

SUBJECT : Pharmaceutical Science

10004

Sr. No. ....

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Father's Name \_\_\_\_\_

Mother's Name \_\_\_\_\_ Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

\_\_\_\_\_  
(Signature of the Invigilator)

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3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
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PHD/URS-EE-2022/(Pharmaceutical Science)(SET-X)/(D)



1. Match the drugs with their mechanism of action.

Drug	Mechanism
P Methotrexate	I Competitive inhibition of PABA uptake
Q Para Aminosalicyclic acid	II Nucleic acid binding to viral enzymes
R Acyclovir	III Inhibition of dihydrofolate reductase
S Rifampicin	IV Inhibition of DNA dependent RNA polymerase

(1) P-IV, Q-III, R-II, S-I,

(2) P-I, Q-III, R-II, S-IV

(3) P-IV, Q-II, R-III, S-I

(4) P-III, Q-I, R-II, S-IV

2. Which of the following is GABAB agonist ?

(1) Muscimol

(2) Baclofen

(3) Picrotoxin

(4) Bicuculline

3. Which of the following drug is used clinically for enuresis and chronic pain ?

(1) Bupropion

(2) Fluvoxamine

(3) Imipramine

(4) Phenelzine

4. Which of the following is used in methanol poisoning ?

(1) Ethanol

(2) Naltrexone

(3) Disulfiram

(4) None of the above

5. Which of the following is inverse agonist of benzodiazepine receptors ?

(1) Flumazenil

(2)  $\beta$ -Carbolines

(3) Chlordiazepoxide

(4) Glutethimide

6. In which of the following types of seizures Phenytoin is ineffective ?

- (1) Generalized tonic-clonic
- (2) Simple partial
- (3) Complex partial
- (4) Absence

7. Fluoxetine blocks the transport of .....

- (1) Serotonin
- (2) Norepinephrine
- (3) Dopamine
- (4) GABA

8. Which of the following is true for Isoniazid ?

- (1) It requires pyridoxine supplementation
- (2) It may discolor the tears, saliva, urine or feces orange-red
- (3) It causes ocular complications that are reversible if the drug is discontinued
- (4) It may be ototoxic and nephrotoxic

9. Match the followings :

Vitamin	Chemical name
P Vitamin B1	I Riboflavin
Q Vitamin B2	II Thiamine
R Vitamin B6	III Hydroxycobalamine
S Vitamin B12	IV Pyridoxine

- (1) P-IV, Q-III, R-II, S-I,
- (2) P-I, Q-III, R-II, S-IV
- (3) P-IV, Q-I, R-II, S-III
- (4) P-II, Q-I, R-IV, S-III

10. Match the crude drugs with their chemical tests.

Drug	Chemical Test
P Senna	I Meconic acid test
Q Digitalis	II Borntrager test
R Opium	III Fluorescence test
S Ergot	IV Keller-Killiani test
(1) P-IV, Q-III, R-II, S-I,	(2) P-I, Q-III, R-II, S-IV
(3) P-II, Q-IV, R-I, S-III	(4) P-II, Q-I, R-IV, S-III

11. Which of the following describes salbutamol, a  $\beta_2$ -adrenoceptor agonists ?

- (1) Direct acting sympathomimetic
- (2) Indirect acting sympathomimetic
- (3) Direct acting parasympathomimetic
- (4) Indirect acting parasympathomimetic

12. Which of the following physiological processes are *not* parts of the 'fight and flight' response of the body ?

- (1) Vasodilatation in skeletal muscle
- (2) Increased gut motility
- (3) Bladder relaxation
- (4) Sweating

13. Where is the hormone erythropoietin produced in the body ?

- (1) Spleen
- (2) Liver
- (3) Thyroid
- (4) Kidney

14. Partial agonists are molecules that .....

- (1) can always cause a maximal response irrespective of the presence of antagonists.
- (2) have affinity toward the target receptor but no efficacy.
- (3) have affinity and efficacy toward the target receptor.
- (4) have an agonistic effect on the receptor, but only ever achieve a submaximal response

15. Which of the following statement is **correct** for bioavailability ?

- (1) Bioavailability describes the proportion of the drug administered that is metabolised very quickly and thus is not available to induce a physiological effect.
- (2) Bioavailability describes the ability of the administered drug metabolites to cause undesirable physiological effects.
- (3) Bioavailability is used to describe the fraction of the dose of drug administered that is present within the body and facilitates the desired physiological effects.
- (4) Bioavailability is the length of time an administered drug is present in the body and thus is available to cause a physiological effect.

16. Microorganisms on culturing in nutrient broth show growth at different locations in the test tube. Match the location of growth with the characteristics of microbes.

Growth location	Microbial characteristics
I Bottom of the test tube	P Facultative anaerobe
II Whole of the test tube	Q Obligate aerobes
III Top of the test tube	R Microaerophile
IV Slightly below the top of the test tube	S Obligate anaerobes

(1) I-S, II-P, III-Q, IV-R

(2) I-P, II-Q, III-R, IV-S

(3) I-S, II-P, III-R, IV-Q

(4) I-S, II-R, III-P, IV-Q



17. Match the following drugs with their therapeutic category.

Drugs	Therapeutic Indications
I Alogliptin	P MDR-Tuberculosis
II Bedaquiline	Q Cushing's disease
III Roflumilast	R Chronic obstructive pulmonary disease
IV Pasireotide	S Type 2 Diabetes mellitus
(1) I-S, II-P, III-Q, IV-R	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

18. Match the following NSAIDs with their chemical class :

NSAIDs	Chemical class
I Indomethacin	P Propionic acid derivative
II Ibuprofen	Q Pyrrolo-pyrrole derivative
III Diclofenac	R Indole derivative
IV Ketorolac	S Arylacetic acid derivative
(1) I-R, II-P, III-S, IV-Q	
(2) I-P, II-Q, III-R, IV-S	
(3) I-S, II-P, III-R, IV-Q	
(4) I-S, II-R, III-P, IV-Q	

19. In which of the following conditions Ketoacidosis is **not** present :

- |                       |                        |
|-----------------------|------------------------|
| (1) Diabetes mellitus | (2) Starvation         |
| (3) Dehydration       | (4) Diabetes insipidus |

20. Which of the following are **not** the signs of inflammation ?
- (1) Swelling (2) Pallor  
(3) Redness (4) Pain
21. Which of the following states that the rate of heat flow through a uniform material is directly proportional to the area and temperature gradient, while inversely proportional to the length of the path of flow :
- (1) Rittinger's Law (2) Zeroth Law  
(3) Fourier Law (4) Fick's Law
22. A powder is called the coarse powder if all the particles pass through a sieve with nominal mesh aperture of ..... and not more than 40% by weight through a sieve with nominal mesh aperture of ..... .
- (1) 710  $\mu\text{m}$ , 250  $\mu\text{m}$  (2) 350  $\mu\text{m}$ , 180  $\mu\text{m}$   
(3) 180  $\mu\text{m}$ , 125  $\mu\text{m}$  (4) 1700  $\mu\text{m}$ , 355  $\mu\text{m}$
23. What is observed during mixing of solids in V-Cone Blender, if the speed kept to high speed ?
- (1) Segregation (2) Sedimentation  
(3) Uniform dispersion (4) None of these
24. Corrosion of metals is fairly high in one of the following medium :
- (1) Acidic (2) Alkaline  
(3) Neutral (4) Non-Aqueous
25. The list of authoritative books of Ayurvedic, Sidhha and Unani Tibb system is given in ..... of the Drugs and Cosmetics Act 1940.
- (1) Schedule T (2) First Schedule  
(3) Schedule M<sub>1</sub> (4) Schedule P

26. .... deals with the list of drugs exempted from certain provisions governing manufacture and sale of drugs.
- (1) Schedule K (2) Schedule D  
(3) Schedule X (4) Schedule P
27. The label on containers for drugs for internal use, listed in Schedule X must contain the following information :
- (1) Symbol XRx in red letters on the top left corner  
(2) Manufacturing licence No.  
(3) Warning : To be sold by retail on the prescription of Registered Medical practitioner only  
(4) All of these
28. Which type of the bond geometry is associated with the complexes having coordination number 4 ?
- (1) Tetrahedral (2) Trigonal  
(3) Square planar (4) Linear
29. Identify the derived property of powders :
- (1) Surface area (2) Solubility  
(3) Size distribution (4) Porosity
30. Which of the following statement is NOT TRUE for Passive diffusion ?
- (1) It can be explained by Fick's Law  
(2) It is an energy independent process  
(3) Drugs moves against the concentration gradient  
(4) It is non saturable process

31. Diamorphine differs from morphine by the presence of :  
(1) two methyl groups (2) two acetyl groups  
(3) one acetyl group (4) one methyl group
32. Esomeprazole is the ..... of omeprazole :  
(1) (S)-enantiomer (2) (R)-enantiomer  
(3) E-isomer (4) racemic mixture
33. Which of the following is the most appropriate parameters for qualitative identification of substances in chromatography ?  
(1) Retention time (2) Resolution factor  
(3) HETP (4) Relative retention factor
34. Which of the following carbonyl compound reacts violently with water ?  
(1) Ethanal (2) Ethanoic acid  
(3) Ethanoyl chloride (4) Butan-2-one
35. The reaction of conversion of an aldehyde to alcohol is ..... .  
(1) Oxidation (2) Polymerization  
(3) Reduction (4) Esterification
36. Which one of the following compounds does not absorb light in the UV-Vis spectrum ?  
(1) Paracetamol (2) Diclofenac  
(3) Curcumin (4) Chloral hydrate
37. The primary site for amino acid catabolism is ..... .  
(1) Kidney (2) Liver  
(3) Brain (4) Adipose tissue



38. The tertiary structure of protein refers to :
- (1) the overall 3D shape
  - (2) the sequence of amino acids
  - (3) the sequence of nucleotides
  - (4) the arrangement of subunits
39. Identify the **correct** statement for glycolysis :
- (1) The gluconeogenesis is the exact opposite of glycolysis.
  - (2) In glycolysis, the glucose is formed from pyruvate.
  - (3) Glycolysis can take place under anaerobic conditions.
  - (4) The mitochondria is the primary site of glycolysis.
40. What is the term used for drugs that are similar in structure to a known drug and which are used for the same purpose ?
- (1) copycat' drugs
  - (2) 'me-too' drugs
  - (3) derivative' drugs
  - (4) 'analogue' drugs
41. Stomatal number is defined as average number of stomata .....
- (1) per leaf blade
  - (2) per mm<sup>2</sup> area of leaf epidermis
  - (3) per cm<sup>2</sup> area of leaf epidermis
  - (4) per inch<sup>2</sup> area of leaf epidermis
42. Match the crude drugs with their respective trichome types.

Crude drug	Trichome types
P Cassia	I Lignified trichomes
Q Datura	II Appressed trichomes
R Stropanthus	III Multiseriate trichomes
S Nux-Vomica	IV Unicellular covering trichomes
(1) P-IV, Q-III, R-II, S-I,	(2) P-I, Q-III, R-II, S-IV
(3) P-IV, Q-I, R-II, S-III	(4) P-II, Q-I, R-IV, S-III

43. Which of the following crude drugs contain Eugenol ?  
(1) Coriander (2) Fennel  
(3) Tulsi (4) Cardamom
44. Ginkgo biloba is used for its ..... activity.  
(1) expectorant (2) lipid lowering  
(3) PAF antagonistic (4) antidepressant
45. Inulin renal clearance is used for measurement of .....  
(1) effective renal blood flow  
(2) glomerular filtration rate  
(3) renal drug excretion rate  
(4) active renal secretion
46. Which of the following is characterized by presence of anisocytic stomata ?  
(1) Senna (2) Belladonna  
(3) Digitalis (4) Coca
47. One mg of Lycopodium spores used in quantitative microscopy contain an average of ..... spores.  
(1) 94,000 (2) 92,000  
(3) 90,000 (4) 9,200
48. Glass transition temperature is detected through .....  
(1) X-ray diffraction  
(2) Solution calorimetry  
(3) Thermogravimetry  
(4) Differential scanning calorimetry

49. Triterpenoids are the active constituents of .....  
(1) Jaborandi (2) Rhubarb  
(3) Stramonium (4) Brahmi
50. Which of the following HPLC detector is most sensitive to changes in temperature ?  
(1) Refractive index detector  
(2) Photo Diode Array detector  
(3) Fluorescence detector  
(4) Electrochemical detector
51. The cancer cells in stage 2 .....  
(1) have spread to other parts of the body  
(2) may or may not have spread to lymph nodes  
(3) have spread to the lymph nodes above collar bone  
(4) are not spreading
52. The most common type of angina is :  
(1) Stable angina (2) Microvascular angina  
(3) Variant angina (4) Unstable angina
53. Match the following phytoconstituents with their chemical tests.
- | Alkaloid                   | Ring system                |
|----------------------------|----------------------------|
| I Tropane                  | P Cocaine                  |
| II Indole                  | Q Reserpine                |
| III Isoquinoline           | R Emetine                  |
| IV Diterpene               | S Aconine                  |
| (1) I-S, II-P, III-Q, IV-R | (2) I-P, II-Q, III-R, IV-S |
| (3) I-S, II-P, III-R, IV-Q | (4) I-S, II-R, III-P, IV-Q |

54. Match the following diuretics with their appropriate category.

Diuretic	Category
P Furosemide	I Carbonic anhydrase inhibitor
Q Spironolactone	II Phenoxyacetic acid derivative
R Ethacrynic acid	III Potassium sparing
S Acetazolamide	IV Sulphamoyl derivative
(1) P-IV, Q-III, R-II, S-I,	
(2) P-I, Q-III, R-II, S-IV	
(3) P-IV, Q-I, R-II, S-III	
(4) P-IV, Q-II, R-I, S-III	

55. Which of the following drugs can antagonise 5-HT ?

- |                 |                      |
|-----------------|----------------------|
| (1) Cinnarizine | (2) Cyproheptadine   |
| (3) Ondansetron | (4) All of the above |

56. Which of the following antidiabetic agent can cause lactic acidosis ?

- |                    |                |
|--------------------|----------------|
| (1) Chlorpropamide | (2) Phenformin |
| (3) Glipizide      | (4) Metformin  |

57. Which of the following is a preferred drug for the management of osteoporosis caused by high-dose use of glucocorticoids ?

- |                 |                |
|-----------------|----------------|
| (1) Alendronate | (2) Calcitonin |
| (3) Mestranol   | (4) Vitamin D  |

58. Identify the potassium channel opener from among the following :

- |                   |                 |
|-------------------|-----------------|
| (1) Pinacidil     | (2) Hydralazine |
| (3) Glibenclamide | (4) Amiloride   |



59. Metronidazole is least likely to be effective in the treatment of :
- (1) Amebiasis
  - (2) Giardiasis
  - (3) Pseudomembranous colitis
  - (4) Pneumocystosis
60. Identify the drug whose concurrent use is likely to cause failure of oral contraception :
- (1) Isoniazid
  - (2) Rifampicin
  - (3) Cimetidine
  - (4) Propranolol
61. The C-24 glycosides give the following test positive :
- (1) Liberman's sterol test
  - (2) Baljet test
  - (3) Legal test
  - (4) All of the above
62. The IR spectrum of the organic liquid can be taken up by placing it between a pair of polished plate made of :
- (1) Sodium chloride
  - (2) Potassium bromide
  - (3) Aluminium chloride
  - (4) Both (1) and (2)
63. Which of the following cannot be used as reference electrode ?
- (1) Calomel electrode
  - (2) Glass electrode
  - (3) Silver/silver chloride electrode
  - (4) Standard Hydrogen electrode

64. Which of the following act as precursors for the biosynthesis of Atropine?  
(1) Ornithine and Phenylalanine (2) Tyrosine and Tryptophan  
(3) Tyrosine and Dopamine (4) Tryptophan and Dopamine
65. The biological source of Star Anise is :  
(1) *Pimpinella anisum* (2) *Illicium anisum*  
(3) *Illicium verum* (4) *Illicium religiosum*
66. Peruvoside is naturally obtained from the following :  
(1) Dioscorea (2) Ginseng  
(3) Liquorice (4) Thevetia
67. Sapogenins are characterized by .....  
(1) Spiroketal side chain (2) 27 cholestane system  
(3) Spirostane structure (4) all of the above
68. Steroidal estrogens are produced semi-synthetically from the following plant sterol.  
(1) Gitogenin (2) Diosgenin  
(3) Ditogenin (4) Estrogenin
69. All are phytoestrogens except :  
(1) Genistein (2) Daidzein  
(3) Coumesterol (4) Diethylstilbesterol
70. Shinoda test is used for chemical evaluation of .....  
(1) Alkaloids (2) Flavanoids  
(3) Anthraquinones (4) Lipids

71. Identify the incorrect statement from among the following :
- (1) Aromatic compounds are Planar
  - (2) Aromatic compounds are cyclic
  - (3) Aromatic compounds have  $4n$  electrons
  - (4) Aromatic compounds are generally less reactive than similarly substituted alkenes.
72. In electrophilic aromatic substitution reactions the halides are :
- (1) *Ortho/para* directing and activating
  - (2) *Ortho/para* directing and deactivating
  - (3) *Meta* directing and activating
  - (4) *Meta* directing and deactivating
73. A drug follow zero order degradation kinetics with rate constant  $k_0=0.70$  / day. The initial concentration of drug solution is 75 mg/ml. What would be the concentration of solution after seven days ?
- (1) 70.9 mg/ml
  - (2) 71.8 mg/ml
  - (3) 72.9 mg/ml
  - (4) 69.1 mg/ml
74. How many grams of active ingredient would be required to prepare 920 ml of 0.95% w/v solution ?
- (1) 8.74 gm
  - (2) 874 mg
  - (3) 9.5 gm
  - (4) 950 mg
75. How many grams of the zinc oxide (10%, w/v) cream, be mixed with zinc oxide (1% w/v) cream to prepare 450 gm of zinc oxide (5% w/v) cream ?
- (1) 200 gm
  - (2) 250 gm
  - (3) 50 gm
  - (4) 150 gm

76. How many ml of alcohol would be required to prepare 750 ml of 1 in 20 solution ?  
(1) 2 ml (2) 3.75 ml  
(3) 20 ml (4) 37.5 ml
77. A pseudoplastic liquid .....  
(1) becomes less viscous as the rate of shear increases  
(2) becomes more viscous as the rate of shear increases  
(3) becomes less viscous over time when a constant shear stress is applied  
(4) becomes more viscous over time when a constant shear stress is applied
78. What is the kinematic viscosity of a liquid that has a density of  $1.2 \text{ g cm}^{-3}$  and a dynamic viscosity of 2cP ?  
(1)  $0.6 \text{ m}^2 \text{ s}^{-1}$  (2)  $1.67 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$   
(3)  $1.67 \text{ m}^2 \text{ s}^{-1}$  (4)  $0.6 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$
79. Choose the **incorrect** statement :  
(1) Different polymorphic forms of a drug can have different melting points  
(2) Different polymorphic forms of a drug can have different molecular formulae  
(3) Different polymorphic forms of a drug can have different solubility  
(4) Different polymorphic forms of a drug can have different crystal habit
80. Which of the following represent the strongest intermolecular force of interaction ?  
(1) Hydrogen bond (2) Covalent bond  
(3) London dispersion (4) Dipole-dipole interaction
81. What is the term used for small molecules that bind to different regions of a binding site ?  
(1) epimers (2) isomers (3) isotopes (4) epitopes



82. Which of the following is *not* an endogenous lead compound ?  
(1) neurotransmitter (2) modulator  
(3) alkaloid (4) hormone
83. What bacterial enzyme aids the survival of *Helicobacter pylori* in the stomach ?  
(1) carbonic anhydrase (2) urease  
(3)  $\beta$ -lactamase (4) transpeptidase
84. What sort of receptor is the nicotinic receptor ?  
(1) A G-protein coupled receptor  
(2) A kinase linked receptor  
(3) An intracellular receptor  
(4) An ion channel
85. Which feature of acetylcholine interacts with the binding site of cholinergic receptors by hydrogen bonding ?  
(1) The acyl methyl group  
(2) The ester  
(3) The quaternary nitrogen  
(4) All three N-methyl groups
86. Which of the following needs lie on the top of the pyramid as per Maslow's hierarchy need theory ?  
(1) Physiological needs  
(2) Safety needs  
(3) Self-actualization needs  
(4) Esteem needs

87. The Theory of Leadership which states that the excellent leaders are born, not developed is :
- (1) The Trait Theory
  - (2) The Great Man Theory
  - (3) The Behavioural Theory
  - (4) The Transformational Theory
88. Which heterocyclic ring system is present in Rofecoxib ?
- (1) Furan
  - (2) Indole
  - (3) Pyridine
  - (4) Pyrrole
89. The drying process where Eutectic point is involved :
- (1) Fluid bed drying
  - (2) Tray drying
  - (3) Freeze-drying
  - (4) Both fluid bed and freeze drying
90. During distillation of mixtures of liquids, the one which evaporates first is .....
- (1) more volatile liquid
  - (2) less volatile liquid
  - (3) non-volatile liquid
  - (4) immiscible liquid
91. Which kind of molecules cannot pass through a pore transport ?
- (1) Low Molecular weight molecules
  - (2) Water-soluble drugs
  - (3) Molecules upto 400 Dalton
  - (4) Molecules greater than 400 Dalton

92. Non-linear pharmacokinetics can also be identified as ..... pharmacokinetics.
- (1) dose dependent
  - (2) enzyme capacity limited
  - (3) saturation
  - (4) All of the above
93. Which of the following is the characteristic of non-linear pharmacokinetics ?
- (1) Area under the curve is proportional to the dose
  - (2) Elimination half-life remains constant
  - (3) Area under the curve is not proportional to the dose
  - (4) Amount of drug excreted through remains constant
94. The Non-linear pharmacokinetic arises due to .....
- (1) Pathological alteration at any one of the various pharmacokinetic steps, such as absorption, distribution and/or elimination.
  - (2) Capacity-limited metabolism.
  - (3) Alteration in protein binding characteristics
  - (4) All of the above
95. Which of the following applies to non-compartmental pharmacokinetics ?
- (1)  $MRT = AUMC/AUC$
  - (2)  $AUMC = MRT/AUC$
  - (3)  $MRT = AUC/AUMC$
  - (4)  $AUC = AUMC/MRT$
96. The Wagner-Nelson-Method in compartment modelling is employed for the determination of .....
- (1) absorption rate constant ( $K_a$ ) from % ARA Vs time curve
  - (2) elimination rate constant ( $K_e$ ) from % ARA Vs time curve
  - (3) absorption rate constant ( $K_a$ ) from % ARA. Vs Concentration curve
  - (4) Determination of plasma half life

97. Which of the following drug metabolism reaction is **not** conjugation ?
- (1) Glucuronidation
  - (2) Sulfate formation
  - (3) Hydrolysis
  - (4) Methylation
98. Identify the characteristic feature of colonic release systems.
- (1) They release the drug along the entire length of GIT
  - (2) They use enteric coating.
  - (3) They employ polymers that dissolve only in the alkaline pH of colon
  - (4) Both (2) and (3)
99. Anhydrous lactose offers advantage of ..... over lactose hydrate.
- (1) better flow properties
  - (2) absence of maillard reaction
  - (3) better compressibility
  - (4) none of the above
100. The B tooling and D tooling of tablet machine have different .....
- (1) punch and die length
  - (2) die length but same punch length
  - (3) punch and die diameter
  - (4) die diameter but same punch diameter



Ph.D/URS entrance exam answer key 2021-22

	A	B	C	D
1	3	4	2	4
2	2	4	1	2
3	1	3	4	3
4	1	4	3	1
5	1	1	3	2
6	4	1	4	4
7	1	3	2	1
8	2	3	1	1
9	2	2	3	4
10	1	3	2	3
11	2	4	2	1
12	1	3	1	2
13	4	2	3	4
14	3	4	3	4
15	3	2	2	3
16	4	3	2	1
17	2	2	1	3
18	1	1	4	1
19	3	3	4	4
20	2	1	1	2
21	4	3	4	3
22	3	2	2	4
23	2	1	3	1
24	4	1	1	1
25	2	1	2	2
26	3	4	4	1
27	2	1	1	4
28	1	2	1	1
29	3	2	4	4
30	1	1	3	3
31	3	2	1	2
32	4	1	2	1
33	1	3	4	4
34	1	3	4	3
35	2	2	3	3
36	1	2	1	4
37	4	1	3	2
38	1	4	1	1
39	4	4	4	3
40	3	1	2	2
41	4	2	3	2
42	4	1	4	1
43	3	2	1	3
44	4	1	1	3
45	1	4	2	2

A

Checked  
David  
11/11/22

A

46	1	2	1	2
47	3	1	4	1
48	3	1	1	4
49	2	4	4	4
50	3	2	3	1
51	1	3	4	2
52	2	4	3	1
53	4	1	2	2
54	4	1	4	1
55	3	2	2	4
56	1	1	3	2
57	3	4	2	1
58	1	1	1	1
59	4	4	3	4
60	2	3	1	2
61	2	4	4	1
62	1	2	4	4
63	2	3	3	2
64	1	1	4	1
65	4	2	1	3
66	2	4	1	4
67	1	1	3	4
68	1	1	3	2
69	4	4	2	4
70	2	3	3	2
71	4	1	2	3
72	2	4	1	2
73	3	2	2	1
74	1	1	1	1
75	2	3	4	1
76	4	4	2	4
77	1	4	1	1
78	1	2	1	2
79	4	4	4	2
80	3	2	2	1
81	1	2	3	4
82	4	1	2	3
83	2	4	1	2
84	1	3	1	4
85	3	3	1	2
86	4	4	4	3
87	4	2	1	2
88	2	1	2	1
89	4	3	2	3
90	2	2	1	1
91	2	1	1	4
92	1	2	4	4

Checked  
Handwritten  
initials



A

93	3	4	2	3
94	3	4	1	4
95	2	3	3	1
96	2	1	4	1
97	1	3	4	3
98	4	1	2	3
99	4	4	4	2
100	1	2	2	3

Checked  
Hawes  
12/2/22