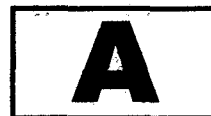


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Booklet No.

Booklet Series

QUESTION BOOKLET



10617

SAMPLE
DIRE-2014

PHARMACEUTICS

Subject Code : 01

Time Allowed : 2 Hours

Maximum Marks : 100

INSTRUCTIONS FOR CANDIDATES

1. Immediately after the commencement of the Examination you should check that this Question Booklet **does not have any unprinted or torn or missing pages or items etc.** If so, get it replaced by a complete Question Booklet.
2. You have to enter your Roll Number on the Question Booklet in the Box provided alongside. **DO NOT** write anything else on the Question Booklet.

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3. Candidate must fill in the necessary information in the space provided on the supplied OMR (Optical Mark Recognition) Answer Sheet before commencement of the Examination. *See directions on the backside of the OMR Answer Sheet.*
4. For marking the correct answer, darken **one** circle by **black** or **blue** ballpoint pen only. **Do not mark on more than one circle.** Darkening more than one circle against an answer will be treated as wrong answer.
5. Do not detach any leaf from this Question Booklet. After the Examination, **hand over the OMR Answer Sheet to the Room Invigilator.** You are allowed to take the Question Booklet after the Examination is over.
6. This Booklet contains **100 questions.** Each question carries **1 mark.** There is no negative marking for any wrong answer.
7. Possession and **use of Calculator, Mobile Phone or similar Electronic Devices is prohibited** in the Examination Hall.
8. Candidates are informed that evaluation of the OMR Answer Sheet will be done by Electronic Machine. So, they should shadow the bubbles of Roll No., Centre Code, Subject Code, Booklet Series and Booklet No. properly, otherwise Machine will not be able to evaluate it. Failure to comply this instruction will be the sole responsibility of the candidate.
9. Candidates appearing in the Examination will be allowed to leave the Examination Hall only after completion of the Examination.

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SEAL

1. Differential scanning calorimetry is used to study

- (A) identity
- (B) purity
- (C) polymorphism
- (D) All of the above

2. Upper and lower consolute temperatures are noticed in

- (A) nicotin-water system
- (B) triethylamine-water system
- (C) phenol-water system
- (D) None of the above

3. One gram-equivalent weight of sodium chloride in 1 litre of solution is equal to

- (A) 1 N
- (B) 1 M
- (C) Both of the above
- (D) None of the above

4. Colligative properties of a solution include

- (A) osmotic pressure
- (B) freezing point
- (C) boiling point
- (D) All of the above

5. pH is expressed as

- (A) $-\log[\text{H}_3\text{O}^+]$
- (B) $\log[\text{H}_3\text{O}^+]$
- (C) Both of the above
- (D) None of the above

6. Which of the following is an essential ingredient of orally disintegrating tablets?

- (A) Potassium chloride
- (B) Sodium bicarbonate
- (C) Sodium starch glycolate
- (D) All of the above

7. Sodium chloride equivalent method is used to adjust

- (A) pH
- (B) tonicity
- (C) buffer capacity
- (D) None of the above

8. Gibbs phase rule is expressed as

- (A) $F = C - P + 2$
- (B) $F = C + P - 2$
- (C) $F = C + P + 2$
- (D) None of the above

9. Inclusion complexes are produced by
 (A) cyclodextrins
 (B) EDTA
 (C) iodine
 (D) picric acid
10. Protein binding studies are conducted by
 (A) filtration
 (B) equilibrium dialysis
 (C) centrifugation
 (D) None of the above
11. Drug absorption through biological membrane involves
 (A) ultrafiltration
 (B) osmosis
 (C) diffusion
 (D) diffusion and membrane transporters
12. The amount M of a material flowing through a unit cross-section s of a barrier in unit time t is known as flux and is written as
 (A) $J = \frac{dM}{s \cdot dt}$
 (B) $J = \frac{s \cdot dt}{dM}$
 (C) $J = s \cdot dt \times dM$
 (D) None of the above
13. pH partition hypothesis explains drug absorption due to
 (A) lipophilicity
 (B) unionized form
 (C) Both of the above
 (D) None of the above
14. Drug release from granular matrices involves
 (A) penetration of surrounding liquid
 (B) dissolution of drug
 (C) leaching of drug
 (D) All of the above simultaneously
15. Sink condition is essential in the studies of
 (A) in vitro dissolution
 (B) disintegration
 (C) solubility
 (D) permeability
16. Osmotic delivery system provides
 (A) first-order release
 (B) second-order release
 (C) zero-order release
 (D) None of the above

17. Class II drug as per BCS classification has

- (A) high solubility and high permeability
- (B) low solubility and high permeability
- (C) high solubility and low permeability
- (D) low solubility and low permeability

18. Sink condition implies

- (A) dissolved drug is less than 20% of saturation concentration
- (B) dissolved drug is more than 20% of saturation concentration
- (C) dissolved drug is less than saturation concentration
- (D) dissolved drug equals saturation concentration

19. As per USP 26, simulated gastric fluid has a pH of

- (A) 1.2
- (B) 2.2
- (C) 6.8
- (D) None of the above

20. Flow through cell is involved in the USP dissolution apparatus

- (A) I
- (B) II
- (C) III
- (D) IV

21. Hixson-Crowell cube root law is used to understand dissolution behaviour

- (A) when geometric shape of dosage form stays constant during dissolution
- (B) when geometric shape of dosage form is altering during dissolution
- (C) Both of the above
- (D) None of the above

22. The dosage form that is waived off from bioavailability assessment is

- (A) intravenous injection
- (B) antacid tablet
- (C) local analgesic ointment
- (D) All of the above

23. The ratio of maximum tolerated dose to minimum effective dose is known as
- (A) bioavailability
 - (B) therapeutic index
 - (C) therapeutic efficacy
 - (D) toxicity
24. P-glycoprotein (Pgp) receptors located in the gut lumen are responsible for
- (A) enhancing drug absorption
 - (B) selectively transporting peptides into blood
 - (C) reducing drug bioavailability
 - (D) decreasing drug solubility in gut membrane
25. Absolute bioavailability ranges from
- (A) 0-1
 - (B) 0-2
 - (C) 1-2
 - (D) None of the above
26. The availability of a drug product as compared to another dosage form or product of same drug given in same dosage' refers to
- (A) absolute bioavailability
 - (B) relative bioavailability
 - (C) Both of the above
 - (D) None of the above
27. Entry of any molecule into a cell is the result of selective solubility in cells' boundary is related to
- (A) DLVO theory
 - (B) Overton's rule
 - (C) Alexander Ure's concept
 - (D) None of the above
28. Theobroma oil exists in polymorphic forms' specify
- (A) two
 - (B) three
 - (C) four
 - (D) Nil
29. In suspensions, drug degradation follows
- (A) first-order kinetics
 - (B) second-order kinetics
 - (C) apparent zero order
 - (D) None of the above
30. Diffusion cell is used to study
- (A) dissolution
 - (B) absorption
 - (C) permeability
 - (D) None of the above

31. The rate at which a solid dissolves is related to

- (A) solubility
- (B) diffusion coefficient
- (C) surface area
- (D) All of the above

32. HLB scale values of o/w emulsifying agents vary in between

- (A) 1-3
- (B) 3-8
- (C) 8-16
- (D) 16-18

33. Sodium lauryl sulfate has an HLB value of

- (A) 10
- (B) 20
- (C) 15
- (D) 40

34. The HLB value of a surfactant, when saponification number is 45.5 and acid number is 276, is

- (A) 15
- (B) 16.7
- (C) 20
- (D) None of the above

35. Sulfonyl urea's overdose toxicity can be reduced by

- (A) desorption
- (B) absorption
- (C) dialysis
- (D) charcoal adsorption

36. The adsorption isotherm exhibited by activated charcoal-select best fit is

- (A) Langmuir type
- (B) Freundlich type
- (C) Both of the above
- (D) None of the above

37. Gegenions have opposite charge to

- (A) potential-determining ions
- (B) counterions
- (C) Both of the above
- (D) None of the above

38. Potential located at the shear plane is known as

- (A) Nernst potential
- (B) zeta potential
- (C) Both of the above
- (D) None of the above

39. Surfactants form micelles

- (A) at CMC
- (B) below CMC
- (C) below and above CMC
- (D) below and at CMC

40. An intramuscular sustained release depot formulation would suit

- (A) shear thinning system
- (B) shear thickening system
- (C) rod-shaped drug crystals in polymer
- (D) None of the above

41. Electrokinetic phenomenon is not involved in

- (A) electrophoresis
- (B) electroosmosis
- (C) osmosis
- (D) sedimentation potential

42. According to Donnan membrane equilibrium, which of the following statements is correct?

- (A) Concentrations of diffusible anion outside and inside the semipermeable membrane are influenced by non-diffusible anion
- (B) Nondiffusible anions and diffusible anions behave similarly inside and outside a semipermeable membrane
- (C) Nondiffusible anion does not influence the concentration of diffusible anion across a semipermeable membrane
- (D) None of the above

43. According to Schultze-Hardy rule, which of the following statements is correct?

- (A) Precipitating power increases rapidly with valency
- (B) Precipitating power is nothing to do with valency
- (C) Solubilizing power increases rapidly with valency
- (D) Solubility parameter increases rapidly with charge

44. According to Hofmeister series, decreasing order of precipitating power of anions is

- (A) citrate < tartarate < sulfate
- (B) citrate > tartarate > sulfate
- (C) citrate < sulfate < tartarate
- (D) tartarate < citrate < sulfate

45. Coacervate is

- (A) colloid-rich layer
- (B) colloid-poor layer
- (C) colloidal solution
- (D) crystalloid

46. Cloud point is

- (A) the temperature above which cloud disappears
- (B) the temperature above which cloud appears
- (C) the pH above which cloud appears
- (D) the pH above which cloud disappears

47. Kraft point is

- (A) the temperature at which the solubility of surfactant equals the CMC
- (B) the temperature above which cloudiness occurs
- (C) not related with solubility
- (D) the pH at which solubility is less

48. The surface diameter 'ds' is

- (A) the diameter of a sphere having the same volume as the particle
- (B) the diameter of a sphere having the same observed area as particle when viewed normal to its most stable plane
- (C) the diameter of a sphere having the same surface area as the particle in question
- (D) None of the above

49. Andreasen's apparatus (pipette) is used for determination of

- (A) particle charge
- (B) particle size
- (C) particle count
- (D) particle shape

50. Which one of the following is used for preparing clear gels?

- (A) Carbopol
- (B) Starch
- (C) Cyclodextrin
- (D) Spray-dried lactose

51. Specific surface deals with

- (A) surface area per unit volume/weight
- (B) surface area of a specified object
- (C) surface area of a crystal
- (D) surface area of a particle

52. Porosity is defined as the ratio of

- (A) void volume to true volume of packing
- (B) void volume to bulk volume of packing
- (C) true volume to bulk volume of packing
- (D) bulk volume to true volume of packing

53. Angle of repose is

- (A) maximum angle possible between the surface of pile of powder and vertical plane
- (B) maximum angle possible between the surface of pile of powder and horizontal plane
- (C) contact angle of powder with surface
- (D) refractive angle of a crystal

54. Bingham bodies exhibit

- (A) Newtonian flow
- (B) simple plastic flow
- (C) dilatant flow
- (D) simple pseudoplastic flow

55. Kinematic viscosity is the ratio of

- (A) absolute viscosity and density of liquid at a definite temperature
- (B) absolute viscosity and volume of liquid at a definite temperature
- (C) absolute viscosity and density of water at a definite temperature
- (D) absolute viscosity and density of liquid at any temperature

56. Dilatant materials exhibit

- (A) shear thinning
- (B) shear thickening
- (C) both shear thinning and shear thickening
- (D) None of the above

57. Thixotropy is desirable in case of

- (A) suspensions
- (B) solutions
- (C) ointments
- (D) tablets

58. Brookfield viscometer (Searle type) is a

- (A) cup and bob type
- (B) cone and plate type
- (C) falling sphere type
- (D) capillary type

59. Plug flow is a disadvantage in

- (A) cone and plate viscometer
- (B) cup and bob viscometer
- (C) capillary viscometer
- (D) falling sphere-type viscometer

60. Deflocculated particles

- (A) settle slowly, eventually form sediment, aggregate and result in hard cake
- (B) settle rapidly, do not form a cake and resuspend easily
- (C) do not settle and sediment
- (D) remain in a state of Brownian motion

61. Structured vehicles

- (A) provide stability to suspensions by reducing sedimentation
- (B) provide instability to suspensions and hasten sedimentation
- (C) improve the solubility in suspensions
- (D) decrease the solubility in suspensions

62. Ostwald ripening is observed in

- (A) solutions
- (B) suspensions
- (C) tablets
- (D) capsules

- 63.** When a gel stands for sometime, it shrinks and some of its liquid is pressed out. This phenomenon is known as
- (A) syneresis
 - (B) imbibition
 - (C) bleeding
 - (D) drying
- 64.** Bentonite gel belongs to
- (A) organic hydrogel
 - (B) absorption base
 - (C) inorganic gel
 - (D) emulsion base
- 65.** OROS is also known as
- (A) oral rehydration powder
 - (B) oral solution
 - (C) elementary osmotic pump
 - (D) oral solid dosage form
- 66.** Partial or complete separation of the top or bottom crowns of a tablet from the main body of tablet is known as
- (A) breaking
 - (B) picking
 - (C) mottling
 - (D) capping
- 67.** The use of colourants may solve
- (A) picking problem
 - (B) lamination problem
 - (C) mottling problem
 - (D) capillary problem
- 68.** In tablet weight variation test as per USP 20, the tolerance allowed for tablets above 324 mg is
- (A) 5%
 - (B) 7.5%
 - (C) 10%
 - (D) 2%
- 69.** In weight variation test, the number of tablets tested as per USP is
- (A) 10
 - (B) 15
 - (C) 20
 - (D) 5
- 70.** A roller compacter is used in
- (A) wet granulation
 - (B) compression granulation
 - (C) direct compression
 - (D) None of the above

71. Microcrystalline cellulose belongs to the category of

- (A) lubricant
- (B) diluent
- (C) binder
- (D) glidant

72. Cellulose acetate phthalate is used in

- (A) sugarcoating
- (B) film coating
- (C) enteric coating
- (D) None of the above

73. Capsule shells are prepared by

- (A) type-A gelatin
- (B) type-B gelatin
- (C) Both of the above
- (D) None of the above

74. The capsule size which holds maximum volume comparatively is

- (A) 0
- (B) 1
- (C) 4
- (D) 5

75. Bloom strength is related to

- (A) cohesive strength of cross-linking that occurs between gelatin molecules
- (B) the higher the bloom strength, the more is the capsule stability
- (C) cost of gelatin is directly proportional to bloom strength
- (D) All of the above

76. Microencapsulation technique is used for getting

- (A) taste masking
- (B) sustained release
- (C) reduction in gastric irritation
- (D) All of the above

77. The half-life of a drug that is most suitable for development of peroral sustained release is

- (A) >12 hours
- (B) 3 hours
- (C) <1 hour
- (D) None of the above

78. The material that is not used as release retardant in matrix tablet is
- (A) hydroxypropyl methylcellulose 4000 cps
 - (B) methylcellulose
 - (C) ethylcellulose
 - (D) starch
79. The useful concentration of phenol for preservative action is
- (A) 0.2%–0.5%
 - (B) 1%
 - (C) 0.1%
 - (D) 2%
80. Aspartame is used as
- (A) sweetener
 - (B) colourant
 - (C) binder
 - (D) lubricant
81. Crystal habit of a drug is important for suspensions due to
- (A) redispersibility
 - (B) sedimentation
 - (C) physical stability
 - (D) All of the above
82. Anhydrous hydrophilic petrolatum (USP XX) is made of
- (A) cholesterol, stearyl alcohol, white wax and white petrolatum
 - (B) stearyl alcohol, white wax and white petrolatum
 - (C) cholesterol, white wax and white petrolatum
 - (D) cholesterol, stearyl alcohol and white wax
83. Borax and beeswax combination is used in
- (A) hydrophilic petrolatum USP XX
 - (B) lanolin absorption base
 - (C) cold cream
 - (D) None of the above
84. Cocoa butter is most widely used in the manufacture of
- (A) ointments
 - (B) suppositories
 - (C) gels
 - (D) None of the above
85. Quality control tests of suppositories include
- (A) melting range test
 - (B) breaking test
 - (C) dissolution test
 - (D) All of the above

86. Aerosol product consists of
- (A) propellant, container, product concentrate, valve and actuator
 - (B) product concentrate, container, actuator and valve
 - (C) propellant, valve and actuator
 - (D) None of the above
87. Propellant II is known as
- (A) Trichloromonofluoromethane
 - (B) Dichlorodifluoromethane
 - (C) Trichloromonofluoroethane
 - (D) None of the above
88. Containers of aerosols should withstand the following pressure as high as
- (A) 140–180 psig at 130° F
 - (B) 100–140 psig at 130° F
 - (C) 50–100 psig at 130° F
 - (D) None of the above
89. Formulation systems of pharmaceutical aerosol may include
- (A) solution system
 - (B) water-based system
 - (C) dispersion systems, quick-breaking foam system
 - (D) All of the above
90. Disposable syringes are sterilized by
- (A) ethylene oxide
 - (B) moist heat
 - (C) UV radiation
 - (D) boiling with bactericide
91. USP type I glass is
- (A) highly resistant borosilicate glass
 - (B) treated soda lime glass
 - (C) soda lime glass
 - (D) None of the above
92. For sterile products, preferred type of glass is
- (A) type III
 - (B) type II
 - (C) type I
 - (D) NP
93. Water for injection is prepared by
- (A) reverse osmosis
 - (B) filtration
 - (C) Both of the above
 - (D) None of the above
94. Water for injection is stored in industries by holding at
- (A) 80 °C
 - (B) 50 °C
 - (C) 37 °C
 - (D) 4 °C

95. Quality control tests of parenteral injection include

- (A) leaker test and clarity test
- (B) pyrogen, sterility, leaker and clarity tests
- (C) pyrogen, leaker and clarity tests
- (D) pyrogen, sterility and clarity tests

96. LAL test is based on

- (A) formation of gel within 60 min at 37 °C
- (B) formation of gel within 15 min at 37 °C
- (C) no gel formation at all
- (D) None of the above

97. Class 100 area deals with

- (A) a clean room in which particle count in the air is not more than 100 per cubic foot of 0.5 µm and larger size
- (B) a clean room in which particle count in the air is not more than 100 per cubic inch of 0.5 µm and larger size
- (C) a clean room in which particle count in the air is not more than 100 per cubic meter of 0.5 µm and larger size
- (D) None of the above

98. The area suitable for critical operations is

- (A) class 100
- (B) class 1000
- (C) class 10000
- (D) None of the above

99. Depyrogenation of glassware and equipment is done by

- (A) heating to 650 °C for 1 min
- (B) heating to 250 °C for 45 min
- (C) None of the above
- (D) Both of the above

100. Filled glass ampoules are sealed by

- (A) tip seals
- (B) pull seals
- (C) Either of the above
- (D) None of the above

SPACE FOR ROUGH WORK

SEAL

★ ★ ★

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16

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