PUNJAB PUBLIC SERVICE COMMISSION

Objective Type Test (December-2017) for Recruitment of Lecturer Pharmacy in the Department of Technical Education & Industrial Training, Government of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Candidate's Name _____

Father's Name _____

Date of Birth ☐☐ ☐☐ ☐☐☐☐   Category Code* ☐☐
    DD   MM   YYYY   (*as given in the admit card)

OMR Response Sheet No. _____

Roll No. _____

Candidate's Signature (Please sign in the box)

Question Booklet Set

A

Booklet Series No.

INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant columns (other than the columns related to marking responses to the questions) of the Optical Mark Reader (OMR) response sheet, supplied separately.

2. Use only blue or black ball point pen to fill the relevant columns on this page. Use of fountain pen may leave smudges which may make the information given by the candidate here illegible.

3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible.

4. Before attempting the paper, the candidate must fill all the columns given above on this page and sign at the appropriate place.

5. Each candidate is required to attempt 100 questions in 120 minutes, except for orthopaedically/visually impaired candidates, who would be given 40 extra minutes, by marking correct responses on the OMR sheet which would be supplied separately to the candidates.

6. The candidate must write the following on the OMRs sheet:
(a) Serial number of OMR sheet supplied to him/her for marking the responses to the questions.
(b) Serial number of the question booklet
(c) Series of the question booklet. Failure to do so may lead to cancellation of candidature or any other action which the Commission may deem fit.

7. The candidate should darken the appropriate response to the question by completely darkening the appropriate circle/oval according to his/her choice of response i.e. a, b, c or d in the manner shown in the example below.

   a   b   c   d

8. Partly darkening the circle/oval on the OMR response sheet or using other symbols such as tick mark or cross would not result in evaluation of the response as the OMR scanner can only interpret the answers by reading the darkened responses in the manner explained in preceding paragraph. Darkening more than one circle/oval as response to a question shall also be considered as wrong answer. The candidates are advised not to erase any marked answer on the OMR sheet as it may lead to double reading of the answer by the scanner.

9. The candidates shall ensure that the responses are marked in correct manner and any adverse impact due to wrong marking of responses would be the responsibility of the respective candidate. The following are some of the **examples of wrong marking** of responses on the OMR response sheet.

10. The candidates, when allowed to open the question paper booklet, must check the booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should immediately bring this fact to the notice of the invigilation Staff and obtain a booklet of the same series as given earlier.

11. The serial number of the new booklet should be entered in the relevant column of the OMR. The Invigilation Staff must make necessary corrections in their record regarding the change in the serial no. of question booklet.

12. The question paper booklet has 14 pages.

13. Each question shall carry three marks.

14. There are four options for each question and the candidate has to mark the MOST APPROPRIATE answer on the OMR response sheet using blue or black ball point pen.

15. There is no negative marking for wrong answers or questions not attempted by the candidate.

1. Who among the following is Chief Election Commissioner of India?
   (A) Swatanter Kumar
   (B) V S Sampath
   (C) Nazim Zaidi
   (D) A.K. Jyoti

2. In which country is the Chabahar Port located?
   (A) Iran
   (B) Saudi Arabia
   (C) Afghanistan
   (D) Pakistan

3. Which of the following State Assemblies recently passed a bill awarding death to those found guilty of raping girls aged 12 and below:
   (A) Himachal Pradesh
   (B) Haryana
   (C) Uttar Pradesh
   (D) Madhya Pradesh

4. Who among the following Gurus wrote 'Zafarnama'?
   (A) Guru Nanak Dev Ji
   (B) Guru Arjun Dev Ji
   (C) Guru Teg Bahadur Ji
   (D) Guru Gobind Singh Ji

5. Who among the following has written 'Kagaz te Canvas'?
   (A) Amrita Pritam
   (B) Shiv Kumar Batalvi
   (C) Nanak Singh
   (D) Gurdial Singh

6. Who among the following has recently been appointed as Chief of Film and Television Institute of India (FTTI)?
   (A) Gajendra Chauhan
   (B) Anupam Kher
   (C) Shabana Azmi
   (D) Javed Akhtar

7. Who among the following is known by the name of 'Lokmanya'?
   (A) J.L. Nehru
   (B) B.G. Tilak
   (C) G.K. Gokhle
   (D) S.C. Boss

8. If one-third of one-fourth of a number is 15, then three-tenth of that number is:
   (A) 35
   (B) 36
   (C) 45
   (D) 54

9. A person crosses a 600-m long street in 5 minutes. What is his speed in km per hour?
    (A) 3.6
    (B) 7.2
    (C) 8.4
    (D) 10

10. Fill in the blank

    1, 4, 27, 16, __ , 36, 343
    (A) 25
    (B) 87
    (C) 120
    (D) 125

11. A man is facing south. He turns 135^0 in the anti clockwise direction and then 180^0 in the clockwise direction. Which direction is he facing now?
    (A) North-east
    (B) North-west
    (C) South-east
    (D) South-west

12. Out of the following 4 words which word will come fourth in the English dictionary?
    (A) False
    (B) Follow
    (C) Faithfully
    (D) Fool

13. Which of the following is not a mixture?
    (A) Air
    (B) Sea water
    (C) Soil
    (D) Diamond

14. Night vision devices use which type of waves?
    (A) Radio waves
    (B) Microwaves
    (C) Infrared light
    (D) Ultraviolet light

15. The Bari doab lies between the:
    (A) River Beas and River Ravi
    (B) River Chenab and River Jhelum
    (C) River Beas and River Satluj
    (D) River Ravi and River Chenab

16. Which of the following does NOT describe a metal?
    (A) Malleable and ductile
    (B) Good conductor of electricity
    (C) Lustrous and can be polished
    (D) Brittle

A-2

17. Who founded the Ghadar party in 1913?
    (A) Lala Hardayal
    (B) Lala Lajpat Rai
    (C) Bhagat Singh
    (D) Udham Singh

18. Which Constitutional Amendment Act deals with Panchayati Raj Institutions in India?
    (A) Twenty Fifth Amendment Act
    (B) Thirty Fourth Amendment Act
    (C) Seventy Third Amendment Act
    (D) Seventy Fourth Amendment Act

19. The English East India Company annexed Punjab in -------
    (A) 1749
    (B) 1757
    (C) 1849
    (D) 1857

20. A Judge of Supreme Court can be impeached by:
    (A) President
    (B) Governor
    (C) Parliament
    (D) Election Commission

21. ------------- acid is the chemical name of Vitamin C
    (A) Oxalic
    (B) Ascorbic
    (C) Boric
    (D) Tartaric

22. What was the Government of India Act, 1919 based on?
    (A) Morley-Minto Reforms
    (B) Montagu-Chelmsford Reforms
    (C) Hunter Commission Report
    (D) Nehru Report

23. If two substances react and the temperature of the mixture increases, the reaction is:
    (A) Endothermic
    (B) Not one that produces anything new
    (C) One that requires a catalyst
    (D) Exothermic

24. Milk contains ------------ acid
    (A) Oxalic
    (B) Citric
    (C) Lactic
    (D) Boric

25. While travelling from east to west one can remain:
    (A) On the same latitude
    (B) On the same longitude
    (C) Both on the same latitude and longitude
    (D) Neither on the same latitude nor on the same longitude

26. Bi focal lens is used by a person who has:
    (A) Astigmatism
    (B) Myopia
    (C) Hypermetropia
    (D) Presbyopia

27. The first Battle of Panipat was fought between:
    (A) Humayun and Sher Shah
    (B) Sher Shah and Akbar
    (C) Babur and Ibrahim Lodi
    (D) Ahmad Shah Abdali and Marathas

28. Nitrogen constitutes about 78% of the atmosphere:
    (A) By weight
    (B) By mass
    (C) By volume
    (D) None of these

29. Which was the largest Indian site of Indus Civilization?
    (A) Mohenjodaro
    (B) Lothal
    (C) Chanhudaro
    (D) Dholavira

30. Which constitutional amendment made free and compulsory education to all children in the age group 6-14 years fundamental rights?
    (A) 24th Amendment
    (B) 108th Amendment
    (C) 86th Amendment
    (D) 84th Amendment

31. Which of the following polymer when esterified with phthalic acid gain acid insoluble property?
    (A) HPMC
    (B) Methylcellulose
    (C) Ethylcellulose+
    (D) None of the above

32. Glass transition temperature is detected through,
    (A) X-Ray diffractometry
    (B) Solution calorimetery
    (C) Differential scanning calorimetery
    (D) Thermogravimetric analysis

33. The antibiotic with an imine functionality is:
    (A) Ampicillin   (B)Roxithromycin
    (C) Doxycycline   (D)Chloramphenicol

34. The antiviral drug that is a thiazole analogue is...
    (A) Nelfinavir   (B) Loviride
    (C) Saquinavir   (D) Ritonavir

35. Which formulation does not involve use of oil, surfactants and co-surfactants?
    (A) Multiple emulsion   (B) SEDDS
    (C) Micro-emulsion   (D) Suspension

36. With respect to bioequivalence, the parameter "Cmax" is:
    (A) Affected by the extent of absorption only
    (B) Affected by the rate of absorption only
    (C) Affected by neither rate nor extent of absorption
    (D) Affected by both rate and extent of absorption

37. Sitagliptin belongs chemically to the class
    (A) Sulphonylureas   (B) Thiazolidinediones
    (C) DPP₄ Inhibitors   (D) Biguanides

38. Indian rhubarb can be distinguished from Rhapontic rhubarb by the fluorescence it emits. Indian rhubarb gives _____ fluorescence.
    (A) Deep yellow   (B) Deep violet
    (C) Orange   (D) Pale green

39. Which of the following statement is wrong?
    (A) A singlet or triplet state may result when one of the electrons from the HOMO is excited to higher energy levels.
    (B) In an excited singlet state, the spin of the electron in the higher energy orbital is paired with the electron in the ground state orbital
    (C) Triplet excited state is more stable than the singlet excited state
    (D) When the electron from the singlet excited state returns to ground state, the molecule always shows fluorescence phenomenon

40. The surgical dressings are sterilized preferably by _____ sterilization.
    (A) Dry Heat
    (B) Moist heat
    (C) Both
    (D) None

41. Microscopy of bulbs of *Urginea indica of* family Liliaceae shows:
    (A) Prisms of calcium oxalate
    (B) Calcium carbonate & silica
    (C) Rosettes of calcium oxalate
    (D) Raphides of calcium oxalate

42. Indian Senna and African Senna differ from each other with respect to:
    (A) Vein islet number
    (B) Stomatal index
    (C) Colour
    (D) All of the above

43. According to Drug and Cosmetics act, form number 27-B is used for which purpose?
    (A) Application for manufacturing of C/C1 and X with own premises.
    (B) Application for manufacturing of C/C1 but not X with own premises.
    (C) Application for manufacturing of C/C1 and X with loan premises.
    (D) Application for manufacturing of C/C1 but not X with own premises.

44. Match the following volatile oils with their active constituents

(P)	Peppermint oil	1)	(+) limonene
(Q)	Turpentine oil	2)	Cineole
(R)	Eucalyptus oil	3)	α – pinene
(S)	Lemon oil	4)	(-) menthol

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

45. The mode of action of Topotecan is:
    (A) Inhibition of topoisomerase I
    (B) Inhibition of topoisomerase II
    (C) Mitotic inhibition
    (D) Microtubule inhibition

46. Laevocetrizine is _____ of cetirizine.
    (A) R form
    (B) S form
    (C) Z form
    (D) M form

47. The antioxidant used to improve the stability in oil systems is _____
    (A) Sodium bisulphite
    (B) Ascorbic acid
    (C) Sulfur dioxide
    (D) Lecithin

48. A drug X has a constant bioavailability and first order elimination, its maintenance dose rate will be directly proportional to?
    (A) Plasma protein binding
    (B) Volume of distribution
    (C) Lipid solubility
    (D) Total body clearance

49. Which pharmaceutical product is not included in schedule C?
    (A) Toxins
    (B) Sera
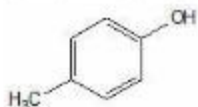   (C) Antigen
    (D) Capsule

50. Morphine when reacts with HCl gives

    (A)   Hydromorphine   (B)   Apomorphine
    (C)   Codeine   (D)   Pholcodeine

51. Rotosort is a machine used to sort out

    (A)   Coated tablets
    (B)   Filled capsules
    (C)   Sealed ampoules
    (D)   Sealed containers

52. Quantitatively the most important glucose transporter in terms of lowering blood glucose level is

    (A) $GLUT_2$
    (B) $GLUT_4$
    (C) $GLUT_5$
    (D) $GLUT_7$

53. *Staphyllococcus aureus* is used in assay of _____ antibiotic.

    (A)   Kanamycin B
    (B)   Rifampicin
    (C)   Streptomycin
    (D)   Tetracycline

54. Flow of current is reduced in which type of detector used in gas chromatography.

    (A) Flame ionisation detector   (B) Electron capture detector
    (C) Thermi ionic detector   (D) Thermal conductivity detector

55. Lignocaine is synthesized from:

    (A) 2,6-Dimethylaniline and Chloroacetyl chloride
    (B) 2,4,6-trimethyl aniline and Chloroacetyl chloride
    (C) 2,6-Dimethylaniline and 2-chloropropanoic acid
    (D) 2,4,6-trimethyl aniline and 2-chloropropanoic acid

56. Contrast media used as radiopaque agent is:

    i. $BaSO_4$
    ii. Urografin
    iii. $MgSO_4$
    iv. Mannitol

    (A) i, ii   (B) i, iii   (C) i, iv   (D) ii, iv

57. Causative organism for whooping cough is:
    (A) *Clostridium tetani*
    (B) *Bacillus pertussis*
    (C) *Treponemma palladium*
    (D) *Vibrio cholera*

58. The maximum amount of capsaicin in capsicum is present in_____.
    (A) Leaves   (B) Seeds
    (C) Roots   (D) Inner walls of fruits

59. Some materials used in the manufacture of pharmaceutical dosage forms are given. Match them with correct use mentioned in A to D.
    1. Sorbitol   (a) Preservative for capsules
    2. Titanium dioxide (b) Plasticizer in soft gelatin capsules
                         (c) Lubricant for tablets
                         (d) Opacifier for gelatin mass

    (A) 1-b, 2-d   (B) 1-d, 2-b
    (C) 1-a, 2-c   (D) 1-c, 2-b

60. Which of the following condition of drug is suitable for developing it in form of sustained release dosage form?
    (A) Low absorption window   (B) Large dose
    (C) Half life 1.5 hr   (D) Mol. Wt. 200 Daltons

61. Sterility test for surgical Suture require incubation for?
    (A) 14 days   (B) 7 days
    (C) 21 days   (D) 12 days

62. In Digitalis glycoside C17 position of the steroidal ring is substituted by
    (A) α-β unsaturated five membered lactone ring
    (B) α-β unsaturated six membered lactone ring
    (C) α-β unsaturated six membered ring
    (D) α-β unsaturated five membered lactam ring

63. t_{90} for the First order reaction is given by.....
    (A) $t_{90} = 0.1C_0/k$ (B) $t_{90} = 0.105C_0/k$
    (C) $t_{90} = 0.101/k* C_0$ (D) None of the above

64. In IR spectrum, the functional group region is from
    (A) $4000cm^{-1}$ to $900cm^{-1}$
    (B) $4000cm^{-1}$ to $1400cm^{-1}$
    (C) $1400cm^{-1}$ to $900cm^{-1}$
    (D) $4000cm^{-1}$ to $660cm^{-1}$

65. Epinephrine added to a solution of lidocaine for local anaesthetic will:
    (A) Cause cyanosis locally
    (B) Increase risk of convulsions
    (C) Increase duration of local anaesthesia
    (D) Decrease heart rate when absorbed

66. Match the following

1.	Ginger	(a)	Mucilaginous
2.	gentian	(b)	Pungent
3.	Linseed	(c)	Acrid
4.	Podophyllum	(d)	Bitter

    (A) 1c,2a,3d,4b   (B) 1b,2d,3a,4c
    (C) 1d,2a,3b,4c   (D) 1 a,2b,3c,4d

67. A patent gives its owner the right to:
    (A) Collect a monetary award from the government
    (B) Exclude others from making, using, selling or importing his/her invention
    (C) Make his/her invention
    (D) Prevent others from making further improvement of his/her invention and get patent protection on the improved invention.

68. Patients on Heparin Therapy observe which of the following side-effects?
    (A) Hyperkalaemia
    (B) Reversible Alopecia
    (C) Thrombocytopenia
    (D) All of the above

69. Quinoline alkaloids are biosynthesized via which one of the following pathways?
    (A) Shikimic acid – tyrosine
    (B) Shikimic acid– tryptophan
    (C) Shikimic acid – cathinone
    (D) Shikimic acid – phenylalanine

70. Na^+/Ca^{+2} exchange mechanism, exchanges
    (A) One Na^+ ion from the exterior for each Ca^{+2} ion extruded
    (B) Two sodium ion from the exterior for each Ca^{+2} ion extruded
    (C) Three Na^+ ion from the exterior for each Ca^{+2} ion extruded
    (D) Three Na^+ ion from the exterior for two Ca^{+2} ion extruded

71. Half- life of a drug may help in determining:
    (A) Dosage schedule of the drug
    (B) Time to get steady state concentration
    (C) Rate of absorption through GIT
    (D) Distribution into different body systems

72. A young man of 22 years of age is suffering from generalized anxiety disorder. He should be preferably prescribed with:
    - (A) Zolpidem
    - (B) Buspirone
    - (C) Midazolam
    - (D) Phenobarbital

73. In a batch of injectable solution consisting of 1000 ampoules, each containing 5 ml of the product, the number of samples to be picked up randomly for sterility testing as per IP is ?
    - (A) 20%
    - (B) 10%
    - (C) 5%
    - (D) 2%

74. Which of the following penicillin is not absorbed orally?
    - (A) Amoxicillin
    - (B) Dicloxacillin
    - (C) Ticarcillin
    - (D) Ampicillin

75. When inhibitor binds only with substrate active site, it is called as
    - (A) Competitive inhibition
    - (B) Non competitive inhibition
    - (C) Mixed inhibition
    - (D) All of the above

76. Drug M with a half-life ($t_{1/2}$) of 45 min displays first-order kinetics, which means that the rate of change of drug concentration in the body by any process is directly proportional to the drug concentration remaining. Which of the following is the elimination rate constant (k_{el}) of drug M given that $k_{el} = 0.693/t_{1/2}$
    - (A) 1.54 min^{-1}
    - (B) 0.0154 h^{-1}
    - (C) 0.0154 min^{-1}
    - (D) 0.0145 min^{-1}

77. A 54-year-old male patient weighing 65 kg requires a loading dose of drug K to treat an infection. Which is a suitable intravenous loading dose of drug K for this patient to achieve a concentration between 7 and 9 mg/L? (Drug K volume of distribution [VD] = 0.25 L/kg.)
    - (A) 75 mg
    - (B) 100 mg
    - (C) 125 mg
    - (D) 150 mg

78. What is meant by a lead compound in medicinal chemistry?
    - (A) A drug containing the element lead.
    - (B) A leading drug in a particular area of medicine.
    - (C) A compound that acts as the starting point for drug design and development.
    - (D) A drug which is normally the first to be prescribed for a particular ailment.

79. Which of the following statements is false with respect to nmr screening to detect drug-target interactions?

    (A) The procedure relies on small molecules (drugs) having shorter relaxation times than large molecules (targets).

    (B) The procedure can be used on mixtures of compounds.

    (C) The method can detect weak binding.

    (D) The method can identify small molecules binding to different regions of the same binding site

80. Calculate the log P value for the structure shown; log P for benzene = 2.13; $\pi(OH)$ -0.67; $\pi(CH_3)$ 0.52.
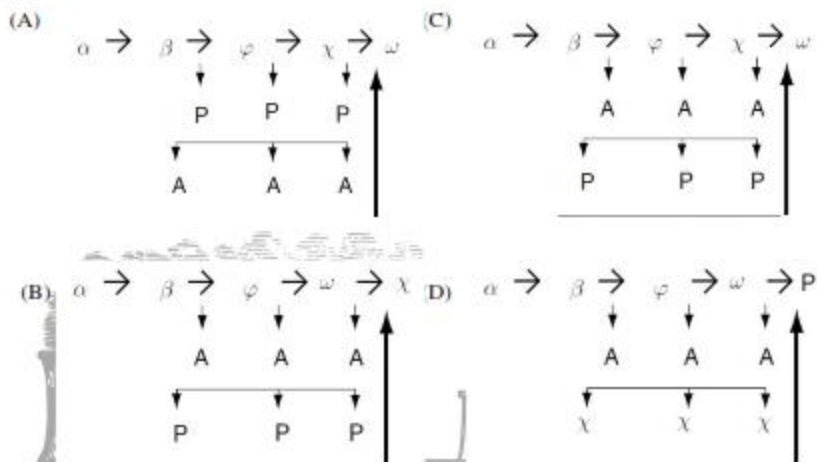

    (A) 3.32

    (B) 0.94

    (C) 1.98

    (D) 2.13

81. Geriatric population should be included in the following phase of clinical trials:

    (A) Phase I

    (B) Phase II

    (C) Phase III

    (D) Phase IV

82. Strategy that aim to minimize bias in clinical trials

    (A) Randomisation

    (B) The double blind technique

    (C) Both A and B

    (D) None of the above

83. In gas chromatography derivatization is desirable to-

    [P] Improve the thermal stability of compound

    [Q] Enable interaction with carrier gas

    [R] Introduce detector oriented tag into the molecule

    [S] Remove contaminants

    (A) P, Q

    (B) Q, R

    (C) P, R

    (D) P, S

84. Aldehydes can be distinguished from other C=O containing compounds by IR, due to-
    (A) The low frequency of absorption of aldehyde
    (B) The alkyl or aryl group is attached to >C=O
    (C) The double bond present
    (D) The doublet at the C-H- stretching region

85. In HPLC the analytical performance improves when-
    (A) Particle diameter is increased
    (B) Particle diameter is reduced
    (C) Coarser particles are paired with shorter column
    (D) low temperature is used

86. Stability testing of new drug substances and products are described in
    (A) ICH Q1B
    (B) ICH Q1C
    (C) ICH Q6A
    (D) ICH Q1A

87. Which of the following listed below is not considered in Insecticide act 1968-
    (A) Carbon Tetrachloride
    (B) Malathion
    (C) Parathion
    (D) Ferrous sulphate

88. 1 in 10000 solution of potassium permanganate contains which of the following concentrations?
    (A) 50.0 mg potassium permanganate in 500 mL solution
    (B) 1.0 mg potassium permanganate in 100 mL solution
    (C) 5.0 mg potassium permanganate in 500 mL solution
    (D) 1.0 mg potassium permanganate in 1000 mL solution

89. A child is prescribed methotrexate once weekly for leukaemia. Upon checking the patient's case notes you find that the child is 2 feet 5 inches tall and weighs 11 kg. The standard paediatric dose of methotrexate for leukaemia is 15 mg/m^2.

Body surface area $(m^2) = \sqrt{\dfrac{\text{weight (kg)} \times \text{height (cm)}}{3600}}$

1 foot = 12 inches = 304.8 mm

Given this information, which of the following is a suitable weekly dose of methotrexate for this child?
    (A) 10 mg
    (B) 9.86 mg
    (C) 8.75 mg
    (D) 7.11 mg

90. Which of the following does not apply to nanotechnology?
    (A) It is a general-purpose technology.
    (B) It can be called Green technology.
    (C) Newtonian mechanics can describe it.
    (D) It involves rearrangement of atoms

91. Nano particles of which atom are used to control collateral damage due to explosion?
    (A) Copper
    (B) Aluminium
    (C) Carbon
    (D) Lead

The sequence of all reactions leading to any alkaloid synthesis can be presented as follows:

Where: α=Precursor
β=Intermediate
φ=Obligatory intermediate
χ=Secondary obligatory metabolism
ω=Final product of metabolism
A=Alkaloid synthesis
P=Postcursor of alkaloid

93. Swelling factors according to BP is:

    (A) With respect to Plantago spp.
    (B) With respect to Ispaghula husk.
    (C) With respect to Iceland moss.
    (D) With respect to Agar

94. A PCR reaction that continues for 30 cycles will produce approximately how many PCR products from a single template DNA molecule?

    (A) 64
    (B) 128,000
    (C) Approximately 1 million
    (D) Approximately 1 billion

95. Which of the following statements are true regarding rDNA technology
(A) rDNA technology is used to obtain large number of copies of specific DNA fragments
(B) rDNA technology is used to obtain large quantities of the protein produced by the concerned gene
(C) rDNA technology is used to integrate gene of interest into chromosomes where it expresses itself
(D) all of these

96. The first successful transformation of rDNA molecule into a bacterium was carried out
(A) Nathan, Arber and smith
(B) Watson, Crick and Wilkins
(C) Boyers and Cohen
(D) Paul Berg

97. The general expression for the appearance of a solute in an effluent is (where V is the elution volume of a substance, V_o void volume, k_D distribution constant and V_i internal water volume)
(A) $V = V_o + k_D V_i$
(B). $V = V_o/V_i$
(C) $V = V_o - k_D V_i$
(D) $V/V_o = k_D V_i$

98. Mechanisms of transmembrane signaling are the following EXCEPT:
(A) Transmembrane receptors that bind and stimulate a protein tyrosine kinase
(B) Gene replacement by the introduction of a therapeutic gene to correct a genetic effect
(C) Ligand-gated ion channels that can be induced to open or close by binding a ligand
(D) Transmembrane receptor protein that stimulates a GTP-binding signal transducer protein (G-protein) which in turn generates an intracellular second messenger

99. Higuchi square root of time law is obeyed in:
(A) Monolith systems
(B) Rate limiting membrane systems
(C) Matrix systems
(D) Both A & C

100. Clarithromycin and erythromycin have very similar spectrums of antimicrobial activity. The major advantage of clarithromycin is that it

(A) Eradicates mycoplasmal infections in a single dose
(B) Is active against strains of streptococci that are resistant to erythromycin
(C) Is more active against Mycobacterium avium complex
(D) Does not inhibit live drug-metabolizing enzymes

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A-14