1. Coal, crude oil, and natural gas are all considered fossil fuels because they were formed from the fossilized, buried remains of plants and animals that lived millions of years ago. For more than a century, burning fossil fuels has generated most of the energy required to propel our cars, power our businesses, and keep the lights on in our homes. Even today, oil, coal, and gas provide for about 80 percent of our energy needs. However, they also have harmful effects, which include:
   A. Land degradation
   B. Water pollution
   C. Air pollution
   D. Overpopulation of animals
   E. Global warming
   F. Ocean acidification
   (a) A, B, C, E, F
   (b) A, B, C, D, E, F
   (c) A, B, C, D, E
   (d) A, B, C, E

2. The cultural tradition of using this substance seems to have developed through a convergent evolution process, as traces of this habit have been separately in many of the early civilizations. This substance is a soft, cohesive substance designed to be chewed without being swallowed, and composed of chicle, sweeteners, softeners, flavors, colors, and a hard or powdered polyol coating. What is this?
   (a) Opium
   (b) Cocoa powder
   (c) Tobacco
   (d) Chewing gum

3. Which of the following substance produces brisk effervescence with baking soda solution?
   (a) Ethanoic acid
   (b) Table salt
   (c) Ice
   (d) Sunflower oil

4. Aspirin was derived from the acetylsalicylic acid found in:
   (a) Petri dish containing bacteria.
   (b) Willow tree bark.
   (c) Petri dish containing fungi.
   (d) Mushrooms.

5. Particulates of…….size pose greatest risk to human health:
   (a) Less than 2.5 micrometres in diameter.
   (b) Less than 7.5 micrometres in diameter.
   (c) Less than 4.5 micrometres in diameter.
   (d) Less than 3.5 micrometres in diameter.

6. An electric fan is switched on in a closed room. The air in the room is:
   (a) Heated.
   (b) Cooled.
   (c) Maintains its temperature.
   (d) Heated or cooled depending on the atmospheric pressure.

7. Long distance short-wave radio broad-casting uses:
   (a) Ground wave
   (b) Ionospheric wave
   (c) Direct wave
   (d) Space wave

8. A tall man of height 6 feet, wants to see his full image. Then required minimum length of the mirror will be:
   (a) 12 feet
   (b) 3 feet
   (c) 6 feet
   (d) 9 feet

9. A plane glass slab is kept over various coloured letters; the letter which appears least raised is:
   (a) Blue
   (b) Violet
   (c) Yellow
   (d) Red

10. Surfactants are compounds that lower the surface tension between two liquids, between a gas and a liquid, or between a liquid and a solid. An example of this is:
   (a) Shampoo
   (b) Blood
   (c) Cooking oil
   (d) Table salt

11. Inulin occurs in the root of:
   (a) Dahlia
   (b) Mango
   (c) Wheat
   (d) Sugarcane

12. Which one of the following alcoholic drinks is produced without distillation?
   (a) Wine
   (b) Whisky
   (c) Rum
   (d) Brandy

13. The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is:
   (a) Vitamin C
   (b) Vitamin B12
   (c) Vitamin E
   (d) Vitamin D

14. Which of the following fractions of petroleum has the lowest boiling point?
   (a) Diesel
   (b) kerosene
   (c) Gasoline
   (d) Heavy oil

15. A well stoppered thermos flask contains some ice cubes. This is an example of:
   (a) Closed system
   (b) Open system
   (c) Isolated system
   (d) Non-thermodynamic system

16. In the table below are shown temperature conversions from Celsius (C) to Fahrenheit (F). Which of the following are CORRECTLY matched?

S. No.	C	FL
A	0	32
B	-10	14
C	100	180
D	-40	-40

(a) A, B, C
(b) B, C, D
(c) A, B, D
(d) A, C, D

17. Two ice cubes are pressed over each other until they unite to form one block. The force mainly responsible for holding them together is:
(a) Van der Waals force.
(b) Dipole-dipole interaction.
(c) Hydrogen bonding.
(d) Covalent bonding.

18. Hypo is used in photography because it is:
(a) A strong reducing agent.
(b) A strong oxidizing agent.
(c) A strong complexing agent.
(d) Photosensitive compound.

19. A piece of ice floats in a vessel with water above which a layer of a lighter oil is poured. How will the level of the interface change after the whole of ice melts? What will be the change in the total level of liquid in the vessel?
(a) Interface falls, total level also falls.
(b) Interface rises, total level falls.
(c) Interface falls, total level rises.
(d) Interface rises, total level also rises.

20. Legal limit of blood alcohol concentration as per traffic rules in India is:
(a) 30 mg in 100ml blood.
(b) 60 mg in 100 ml blood.
(c) 50 mg in 100 ml blood.
(d) 40 mg in 100 ml blood.

21. Water at 24 degrees Celsius feels much colder than air at the same temperature and our body loses heat many times more quickly while in water than it would in air at the same temperature. The reason(s) for this is/are:
A. Water is the better conductor of the two.
B. Water is much easier to touch and feel than air.
C. Water is denser than air.
(a) A
(b) A, C
(c) A, B
(d) B, C

22. If an iron ball and a wooden ball of same radii are released from a height 'h' in vacuum then time:
(a) Unequal.
(b) Exactly equal.
(c) Iron ball will take double the time as compared to wooden ball.
(d) Wooden ball will take double the time as compared to iron ball.

23. A bus is moving with a speed of 10 m/s on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?
    (a) 10 m/s
    (b) 20 m/s
    (c) 40 m/s
    (d) 25 m/s

24. Wood pulp is used to make which of the following:
    A. Paper bags
    B. Calendars
    C. Cardboard boxes
    D. Tissue and toilet papers
    E. Blankets
    F. Building insulation
    G. Diapers and sanitary pads
    (a) A, C, E, F, G
    (b) A, B, C, D, F, G
    (c) A, B, C, D, E, F, G
    (d) A, B, C, D, G

25. A cut trunk shows 26 concentric rings of spring wood and autumn wood in alternate rows. The age of trunk would be:
    (a) 13 years
    (b) 26 years
    (c) 52 years
    (d) 104 years

26. Statins used for lowering blood cholesterol level are extracted from:
    (a) Algae
    (b) Bacteria
    (c) Viruses
    (d) Yeast

27. A pair of fair dice is thrown independently three times. The probability of getting a score of exactly 9 twice is:
    (a) 1/729
    (b) 8/9
    (c) 8/729
    (d) 8/243

28. Big holes in Swiss cheese are produced by:
    (a) A machine.
    (b) A bacterium that produces large amount of methane gas.
    (c) A bacterium producing a large amount of carbon dioxide.
    (d) A fungus that releases a lot of gas during its metabolic activities.

29. With reference to the Indian climate, the Western Disturbances originate over:
    (a) Arabian Sea
    (b) Mediterranean Sea
    (c) Baltic Sea
    (d) Bay of Bengal

30. At an election, a voter may vote for any number of candidates, **NOT** greater than the number to be elected. There are 10 candidates and 4 are to be elected. If a voter votes for at least one candidate, then the number of ways in which he can vote is:
    (a) 5040
    (b) 6210
    (c) 385
    (d) 1110

31. 10 men and 8 women together can complete a work in 5 days. Work done by one woman in a day is equal to half the work done by a man in one day. How many days will it take for 4 men and 6 women to complete that work?
    (a) 12 days
    (b) 10 days
    (c) 8 days
    (d) 4 days

32. When you use your finger to scroll information displayed on a touch screen, the device responds because your finger:
    (a) Exerts pressure that activates pressure sensors.
    (b) Disrupts an electrical current.
    (c) Transfers body's static electricity to the device.
    (d) Generates and completes a piezo-electric circuit.

33. Milk kept at room temperature turns to curd due to:
    (a) Oxidation reaction
    (b) Reduction reaction
    (c) Fermentation
    (d) Concentration

34. Farsighted, or hypermetropic, eye can be CORRECTED using a:
    (a) Converging lens
    (b) Diverging lens
    (c) Cylindrical lens
    (d) Planar lens

35. If the door of a working refrigerator is left open in a well-insulated room, the overall temperature of air in this room will:
    (a) Remain unchanged
    (b) Decrease
    (c) Increase
    (d) Initially increase, then decrease

36. Televisions and computer monitor commonly have a LED screen. The abbreviation LED stands for:
    (a) Linked Electromagnetic Displacement.
    (b) Low Energy Display.
    (c) Luminescent Electronic Detector.
    (d) Light Emitting Diode.

37. Vinegar is:
    (a) Acetic acid
    (b) Oxalic acid
    (c) Citric acid
    (d) Tartaric acid


VEDEMY
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Mr. Anupam
(B.Tech)
Maths Faculty
Tanya
(B.Tech)
English Faculty
बडा लालपुर,चांदमारी, सिंधोरा रोड, वाराणसी

38. Raw vegetables get quickly cooked in a pressure cooker because:
    (a) Its alloy composition improves efficiency of heat transfer.
    (b) Boiling point of water increases at higher pressures.
    (c) More steam can be generated in a sealed utensil.
    (d) High pressure enhances heat penetration into food material.

39. While evaluating an investigational new drug, a 'Phase I study' is conducted on:
    (a) Laboratory animals.
    (b) Few healthy volunteers.
    (c) A single member from the research team.
    (d) Small group of patients.

40. The Indian Council of Medical Research updated its national ethical guidelines for biomedical and health research involving human participants most recently in:
    (a) 2017
    (b) 2018
    (c) 2019
    (d) 2020

41. Among the data collected for a clinical study in diabetic patients, which of the following is **NOT** a scalar variable?
    (a) Blood glucose level at time of enrolment into research study.
    (b) Daily units of insulin prescribed to the patient.
    (c) Age of the patient at time of disease diagnosis.
    (d) District where the patients currently live.

42. The value of variance for the number of COVID cases due to non-adherence to COVID appropriate behaviour is 64. Calculate the value of standard deviation:
    (a) 8
    (b) 4
    (c) 16
    (d) 2

43. ANOVA is a statistical technique, which is used to test which one of the following?
    (a) Equality of means
    (b) Equality of variances
    (c) Equality of quartiles
    (d) Equality of medians

44. A researcher has access to data pertaining to the health expenditure of individuals. If each value of this data series is multiplied by 10, then what will be the effect on the median?
    (a) Median will not be affected.
    (b) One-tenth of the original median value.
    (c) Twice the value of the original median value.
    (d) 10 times of the original median value.

45. The weight of three persons who participated in a health study were 56, 50 and 47 Kilograms. Calculate the arithmetic weight.
    (a) 51
    (b) 53
    (c) 56
    (d) 50

46. Which of the following denotes "Five equal groups into which a population can be divided according to the distribution of values of a particular variable"?

(a) Percentile
(b) Quartile
(c) Quintile
(d) Decile

47. "The percent of total variation in the dependent variable that is explained by the set of independent variables in the study", is denoted by which one of the following?
(a) Covariance
(b) Logistic regression
(c) Multicollinearity
(d) Coefficient of Determination

48. The pre-test with the questionnaire before conducting a survey is denoted by which of the following term?
(a) Non-parametric analysis
(b) Pilot survey
(c) Follow up period
(d) Systematic review

49. A research laboratory examined their data of 100 patients proven to have tuberculosis based on results from sputum culture. Only 40 of them had a positive result on sputum microscopy, while 80 had a positive result from a novel diagnostic test under evaluation. Based on this information, as compared to sputum microscopy, the new test has better:
(a) Sensitivity
(b) Specificity
(c) Positive predictive value
(d) Negative predictive value

50. A researcher administers an achievement test to assess & indicate the possible effect of an independent variable in her study. The distribution of scores in this test is found to be negatively skewed. On this basis what can the researcher deduce regarding the difficulty level of the test?
(a) The test is very easy.
(b) The test is very difficult.
(c) The researcher cannot measure the difficulty level of the test by merely looking at the distribution of the scores.
(d) The test is difficult and needs normalization.

51. Which one of the following fungi is most likely to be found within reticulo-endothelial cells?
(a) Histoplasma capsulatum
(b) Candida albicans
(c) Mucormycosis
(d) Sporothrix schenckii

52. The X factor and/or the V factor is required by which genus of bacteria?
(a) Pasteurella
(b) Haemophilus
(c) Actinobacillus
(d) Zymomonas

53. Autoinfection is seen in life cycle of which parasite?
(a) Schistosoma haematobium
(b) Taenia solium
(c) Nectar americanus
(d) Plasmodium vivax

54. Sterilization on three successive days by steaming at 100°C for 30 minutes is known as:
    (a) Pasteurization
    (b) Tyndallization
    (c) Inspissation
    (d) Fermentation

55. Mesophiles are group of bacteria that grow within the temperature range of:
    (a) 0-20 degree Celsius.
    (b) 20-45 degree Celsius.
    (c) 45-60 degree Celsius.
    (d) More than 60 degree Celsius.

56. The extent to which a person's behaviour, taking medication, following a diet, and/or executing lifestyle changes, corresponds with recommendations from a health care provider, is known as:
    (a) Adherence
    (b) Patient management
    (c) Concordance
    (d) Nursing care

57. A tablet that has no active ingredient and **DOESNOT** have any pharmacological action, but is still used to improve patient's condition is known as:
    (a) Placebo
    (b) Active tablet
    (c) Psychotherapy
    (d) Hypnotherapy

58. Your friends, who are otherwise healthy, are planning to travel to mountains, to heights above 8000ft above sea level. Which of the following medications would you recommend to carry with them?
    (a) Digoxin
    (b) Acetazolamide
    (c) Ipratropium inhaler
    (d) Theophylline

59. A high octanol water partition coefficient is likely to make the drug:
    (a) More permeable to blood brain barrier.
    (b) Easier renal elimination.
    (c) Small volume of distribution.
    (d) High protein binding.

60. Which of the following anti-diabetic drugs can cause vitamin B12 deficiency?
    (a) Glipizide
    (b) Acarbose
    (c) Metformin
    (d) Pioglitazone

61. The volume of air, inspired or expired during normal respiration, is called:
    (a) Tidal volume
    (b) Inspiratory reserve volume
    (c) Expiratory reserve volume
    (d) Residual volume

62. Which of the following statement is **FALSE** about red blood cells (RBCs)?
    (a) Biconcave in shape
    (b) Non-nucleated

(c) Have a life span of 60 days
(d) Formed in red bone marrow

63. A single molecule of haemoglobin can transport up to _____ molecules of oxygen:
(a) One
(b) Two
(c) Four
(d) Eight

64. The hormone involved in rhythmic activities, such as day/night and seasonal changes is:
(a) Calcitonin
(b) Melatonin
(c) Cyclin
(d) Estrogen

65. Kinetoplast is made up of copies of:
(a) RNA
(b) Protein
(c) Fat
(d) Mitochondria DNA

66. Single step large mutation leading to speciation is also called:
(a) Founder effect
(b) Saltation
(c) Branching descent
(d) Natural selection

67. If the total amount of adenine and thymine in a double-stranded DNA is 45%, the amount of guanine in this DNA will be:
(a) 22.5%
(b) 27.5%
(c) 45%
(d) 55%

68. How many DNA duplexes are obtained from one DNA duplex after 10 cycles of PCR?
(a) 2000
(b) 200
(c) 1002
(d) 1024

69. A single nucleotide substitution (C has been replaced by A) has taken place in a gene, but the protein sequence is **NOT** altered. What is the type of such variant called as?
(a) Non-synonymous variant
(b) Synonymous variant
(c) Missense variant
(d) Non-sense variant

70. Which of the following is wrongly paired?
(a) Nucleic acid - hydrogen bond.
(b) Polysaccharide - glycosidic bond.
(c) Proteins - peptide bond.
(d) Phospholipids -phosphate linkage.

71. What does HGVS stands for?
    (a) Human Genome Variation Society.
    (b) Human Gene and Variant Society.
    (c) Human Genome Variant Society.
    (d) Human Gene Variation Society.

72. What type of amplification takes place in sequencing by synthesis technique?
    (a) Loop mediated isothermal amplification.
    (b) Bridge amplification.
    (c) Strand-displacement amplification.
    (d) All of these.

73. The core of the spliceosome complex is formed by:
    (a) Small nuclear RNA
    (b) Small nucleolar RNA
    (c) Small interfering RNA
    (d) Long noncoding RNA

74. DNA and RNA polymerase differ in ALL of the following, EXCEPT:
    (a) Their error rate.
    (b) The type of chemical reaction they catalyse.
    (c) The nucleotide substrates they incorporate.
    (d) Their processivity.

75. On a ribosome, the mRNA is read from……and the polypeptide chain is synthesized from:
    (a) 3' to 5'; C to N terminus.
    (b) 3' to 5'; N to C terminus.
    (c) 5' to 3'; N to C terminus.
    (d) 5' to 3'; C to N terminus.

76. What will be the probability of getting AABB genotype, if a plant with genotype AaBb is self-fertilized? (A and B are **NOT** linked):
    (a) 1/2
    (b) 1/4
    (c) 1/8
    (d) 1/16

77. Which of the following **DO NOT** encompass reverse genetics?
    (a) Genome editing.
    (b) Creating gene-knockout mice.
    (c) Introducing mutations deterministically in a known gene.
    (d) Novel gene discovery by genetic screens.

78. The smallest unit of genetic material which upon mutation produce a phenotypic effect is:
    (a) Gene
    (b) Muton
    (c) Inducer
    (d) Regulator

79. Which of the following conditions is a peroxisomal disorder?
    (a) Acute intermittent porphyria.
    (b) Maple syrup urine disease.
    (c) Medium chain acyl-CoA dehydrogenase deficiency.
    (d) Zellweger syndrome.

80. Which of the following repair pathways can faithfully repair a double-stand DNA break?
    (a) Non-homologous end joining.
    (b) Homologous recombination.
    (c) Base excision repair.
    (d) Nucleotide excision repair.

81. If the father in a family has a disease while the mother is normal, the disease is only inherited by the daughters and **NOT** the sons. Name this type of disease?
    (a) Autosomal recessive
    (b) Autosomal dominant
    (c) Sex-linked recessive
    (d) Sex-linked dominant

82. Mendel did **NOT** observe linkage due to:
    (a) Crossing over
    (b) Synapses
    (c) Mutation
    (d) Independent assortment

83. Alpha 1 anti-trypsin deficiency is an autosomal recessive genetic disorder. What are the chances that any of the offspring **DONOT** express the disease phenotype if both parents are genotype (Aa)?
    (a) 100%
    (b) 75%
    (c) 50%
    (d) 0%

84. Who coined the term 'linkage'?
    (a) Morgan
    (b) Mendel
    (c) Darwin
    (d) De Vries

85. A microbial biocontrol agent that can be used to control butterfly caterpillars is:
    (a) Trichoderma polysporum
    (b) Bacillus thuringiensis
    (c) Streptococcus
    (d) Mycorrhiza

86. A fall in glomerular filtration rate (GFR) activates:
    (a) Juxtaglomerular cell, macula densa and argentaffin cell.
    (b) Juxtaglomerular cell, lacis cell and myoepithelial cell.
    (c) Juxtaglomerular cell, Purkinje cell and chief cell.
    (d) Juxtaglomerular cell, macula densa and lacis cell.

87. Which of the following vertebra is formed from four vertebrae?
    (a) Sacrum
    (b) Coccyx
    (c) Atlas
    (d) Axis

88. Sarcomere is:
    (a) Part between two H-lines.
    (b) Part between two A-lines.
    (c) Part between two I-bands.

(d) Part between two Z-lines.

89. Ends of long bones are covered with:
(a) Blood cells
(b) muscles
(c) ligaments
(d) cartilages

90. The joints between the carpal bones are:
(a) Gliding joints
(b) Hinge joints
(c) Saddle joints
(d) Pivot joints

91. How many fragments will be generated on the digestion of a closed circular DNA molecule with a restriction enzyme having six recognition sites on the DNA?
(a) 5
(b) 7
(c) 6
(d) 9

92. The polymerization of the gel used in PAGE occurs between polyacrylamide and:
(a) N, N-acrylamide
(b) Bis-acrylamide
(c) N-methylene-acrylamide
(d) N, N-methylene-bis-acrylamide

93. Suppose there is a deletion of 5 coding DNA nucleotides 234 to 238 position, which of the following is the CORRECT way to depict it according to HGVS format?
(a) c.234_238del
(b) c.234-238del
(c) c.234del5
(d) All of these are correct

94. Biotechnologies consisting of the use of biological systems (bacteria) for the manufacture, transformation or degradation of molecules through enzymatic or fermentation processes for industrial purposes, are called:
(a) Yellow biotechnologies
(b) Blue biotechnologies
(c) Green biotechnologies
(d) White biotechnologies

95. Which of the following is **NOT** a component of downstream processing?
(a) Separation
(b) Preservation
(c) Purification
(d) Expression

96. Plasmids are used as cloning vectors for which of the following reasons?
(a) Can be multiplied in culture.
(b) Self-replication in bacterial cells.
(c) Can be multiplied in laboratories with the help of enzymes.
(d) Replicate freely outside bacterial cells.

97. The first clinical application of gene therapy over a 4-year-old girl was for:

(a) Adenosine deaminase deficiency
(b) Adenosine deficiency
(c) Growth deficiency
(d) Adenine deficiency

98. The diagram which shows the arrangement of metaphasic chromosomes according to their position of centromere is called:
(a) Histogram
(b) Karyogram
(c) Dendrogram
(d) Ideogram

99. How many types of histone molecules are found in nature?
(a) Three
(b) Four
(c) Five
(d) Six

100. During DNA replication the synthesis of the leading strand of DNA results in fragments known as:
(a) Satellite segments
(b) Kornberg segment
(c) Double-helix segment
(d) Okazaki fragments

101. The role of Aminopterin in HAT media for monoclonal antibody production is:
(a) Salvage pathway blocker.
(b) De novo pathway blocker.
(c) Hybridoma cell stabilizer.
(d) Nucleotide analogue.

102. Guanidinium group is present in:
(a) Histidine
(b) Tryptophan
(c) Arginine
(d) Proline

103. Which component of proteins absorb UV light at 280 nm?
(a) Peptide bonds.
(b) SH group of cysteine.
(c) Imidazole group of tryptophan.
(d) Indole group of tryptophan.

104. Sodium fluoride used in sugar estimation inhibits:
(a) Aldolase
(b) Hexokinase
(c) Enolase
(d) Phosphofructokinase

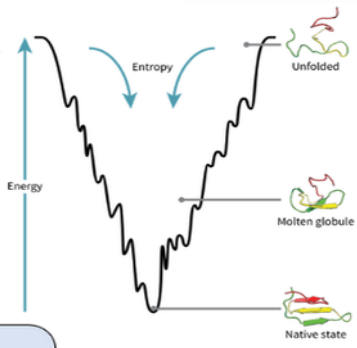
105. Which of the following is required for porphyrin synthesis?
(a) Methionine
(b) Ammonia
(c) Glycine
(d) Alanine

VEDEMY'S CAPSULE (VEDEMY'S SPECIAL NOTES)

Amino acid Classes

Essential	**M**y **V**ery **T**alented **F**riend **I**s **W**aiting **F**or **K**ajo**L**
Semi-essential	**R**ahu**L**
Non-Polar	**GAV** के लोग **PILW** लेकर **FM** सुन रहे थे
Polar Uncharged	**CN**(कार्टून नेटवर्क) pe **STY**(सत्य) **Q**ues पूछते है
Negative charged	Ye **DE**kh
Positive charged	**RaHuL** bola
Gluco-ketogenic	**I**tni **T**alented **WYF** (wife)
Ketogenic	**K**ajo**L**

Protein Folding Curve



Energy profile-
High
- **U**- Unstructured
- **M**- molten globule
- **D**- discrete structure
- **N**- native
- **A**- amorphous
- **A**- amyloid

Low

Urmila **M**atoldkar ka **DNA** **A**chha hai

Hemoglobin

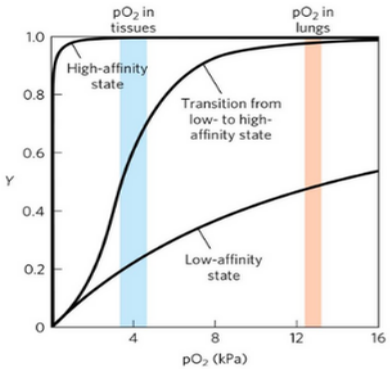
State of Hb – MOLD

- **O**xy Hb
- **L**ess acidic (Tensed state)
- **M**ore acidic (Relaxed state)
- **D**eoxy Hb

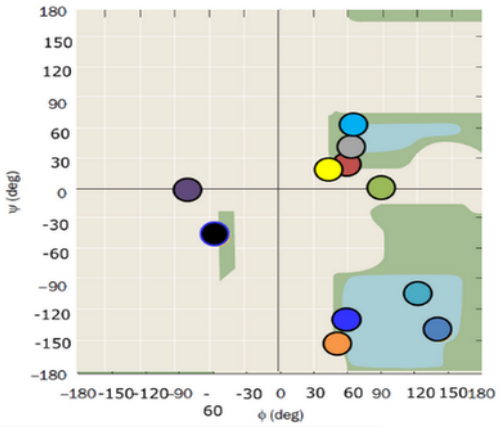
Affinity of Curve – DRIL

H+, Temp. BPG, CO_2

- **I**ncrease → **L**eft shift
- **D**ecrease → **R**ight shift

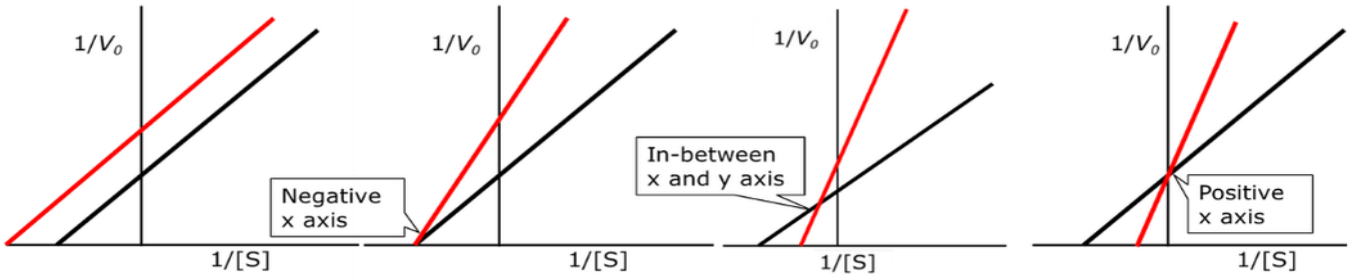


Ramachandran plot



Secondary Structure	Phi	Psi
AP β Sheet	+140⁰	-135⁰
P β Sheet	+120⁰	-115⁰
CTH	+50⁰	-150⁰
L-α-H	-60⁰	-50⁰
R-α-H	+60⁰	+50⁰
Type-I i+1	+60⁰	+30⁰
Type-I i+2	+90⁰	0⁰
Type-II i+1	+60⁰	-120⁰
Type-II i+2	-80⁰	0⁰

Enzyme Inhibition Curve



Uncompetitive Inhibition
Decrease K_m = increased $1/K_m$
Decreased V_{max}= increased $1/V_{max}$

Noncompetitive Inhibition
Decreased V_{max}= increased $1/V_{max}$

Mixed Inhibition
K_m increase
V_{max} decrease

Competitive Inhibition
Increase K_m = decreased $1/K_m$

UP ke **NaNa** patekar **MI** ka **PC** lekar aaye

- **UP**: Parallel → Uncompetitive
- **NaNa**: Negative x axis → Non-competitive
- **MI**: In-between x and y axis → Mixed
- **PC**: Positive x axis → Competitive

106. In tricarboxylic acid (TCA) cycle, fumarate is converted to malate by:
    (a) Removal of H_2O
    (b) Addition of O_2
    (c) Removal of CO_2
    (d) Addition of H_2O

107. Pyridoxal phosphate is used as a coenzyme in various biological reactions. It transfers:
    (a) Amino groups
    (b) Acyl groups
    (c) Hydride ion
    (d) Electrons

108. The patient is to be administered with 250 ml of normal saline per hour using adult infusion set. How much should be the drop rate? (1 ml = 20 drops)
    (a) 83
    (b) 70
    (c) 73
    (d) 75

109. How much financial incentive is given in the sponsored scheme 'Nikshya Poshak Yojana' for nutritional support to each notified tuberculosis (TB) patient under National Health Mission (NHM) per month for duration the patient is on anti-TB treatment?
    (a) Rs. 300/-
    (b) Rs. 400/-
    (c) Rs. 500/-
    (d) Rs. 700/-

110. Early ambulation in postoperative period prevents which complication?
    (a) Pain
    (b) Deep vein thrombosis
    (c) Vomiting
    (d) Infection

111. One year old is suspected for bacterial meningitis, for which lumbar puncture is performed. Which of the following laboratory finding of spinal fluid would support the diagnosis?
    (a) Decrease in cell count
    (b) Elevated protein level
    (c) Elevated glucose level
    (d) Low spinal fluid pressure

112. Growth chart or 'Road to Health' is a visible display of:
    (a) Height for age
    (b) Weight for height
    (c) Height for weight
    (d) Weight for age

113. Which of the following RNA constitutes 90 percent of the total cellular RNA?
    (a) rRNA
    (b) tRNA
    (c) mRNA
    (d) hnRNA

114. In sequence alignment by BLAST, each word from query sequence is typical____ residues for protein sequences and _____residues for DNA sequences:
    (a) Ten, eleven

(b) Three, three
(c) Three, eleven
(d) Three, ten

115. If the purpose is to calculate the probability of one event and a second event, the odds scores for the events are:
(a) Added
(b) Multiplied
(c) Subtracted
(d) Multiplied and added

116. Cryo-preservant used for cells consists of:
(a) 10% DMSO in Fetal Bovine Serum.
(b) 10% NO in Fetal Bovine Serum.
(c) 10% HCI in Fetal Bovine Serum.
(d) 5% HCI in Fetal Bovine Serum.

117. How many unusual bases are observed in a tRNA molecule?
(a) 1
(b) 3
(c) 5
(d) 0

118. COVID-19 caused by:
(a) DNA virus
(b) Double stranded RNA virus.
(c) Positive sense single strand RNA virus.
(d) Negative sense single strand RNA virus.

119. What are the Yamanaka factors used for iPSCs reprogramming?
(a) Nanog, SOX4, Oct-3/4 and c-myc.
(b) SOX2, Klf4, Oct-3/4 and c-myc.
(c) p53, SOX4, Oct-3 and L-myc.
(d) lin28, SOX4, Oct-4 and L-myc.

120. Hybridomas are immortalized for production of unlimited supply of monoclonal antibodies by which of the following:
(a) Cell fusion.
(b) Ectopic expression of telomerase.
(c) Transformation by a retrovirus.
(d) Introduction of oncogenes.

121. Niemann-Pick disease is a:
(a) Lipid storage disorder.
(b) Glycogen storage disorder.
(c) Amino acid metabolism disorder.
(d) Purine metabolism disorder.

122. The electrophoretic technique used to separate very large DNA segments is:
(a) Two-dimensional electrophoresis.
(b) Pulsed-field gel electrophoresis.
(c) High resolution electrophoresis.
(d) Polyacrylamide gel electrophoresis.

123. The process by which normal serum enhances phagocytosis is called:

(a) Chemotaxis
(b) Opsonization
(c) Phosphorylation
(d) Haematopoiesis

124. Cluster of differentiation (CD) molecules are present on:
(a) Surface of cells
(b) In the cytoplasm
(c) In the nucleus
(d) In the mitochondria

125. Ligand for TLR3 receptor is:
(a) dsRNA
(b) Lipopolysaccharide
(c) Lipopeptides
(d) Flagellin

126. Which of the following mechanisms allows complete absorption of glucose from the intestinal lumen into cytosol of enterocyte?
(a) Simple diffusion through GLUT-5.
(b) Sodium channels in enterocyte membrane.
(c) Sodium- Glucose co transporter I (SGLT-1).
(d) Paracellular uptake via gap junctions.

127. The molecular mass of IgG is 150 KDa and that of the antigen-antibody complex formed in the presence of antigen excess is 300 kDa. The molecular mass of antigen is:
(a) 75 KDa
(b) 250 KDa
(c) 125 KDa
(d) 200 KDa

128. All types of chemical forces are involved in antigen-antibody interaction, EXCEPT:
(a) Van der Waal forces
(b) Hydrogen bonds
(c) Hydrophobic bonds
(d) Covalent bonds

129. Predominant antibody in serum is:
(a) IgM
(b) IgD
(c) IgE
(d) IgG

130. Which of the following method **CANNOT** be used to determine the three-dimensional structure of a protein?
(a) X-ray crystallography.
(b) Nuclear magnetic resonance.
(c) Cryo-electron Microscopy.
(d) Ramachandran Plot.

131. During the peak summer and winter the frogs take shelter in deep burrows to protect them from extreme heat and cold. This is called as:
(a) Summer sleep (aestivation) and winter sleep (hibernation).
(b) Summer sleep (hibernation) and winter sleep (aestivation).
(c) Summer sleep (diapause) and winter sleep (suspend).

(d) Summer sleep (dormancy) and winter sleep (diapause).

132. Which of the following pairs of organisms are uricotelic?
(a) Cartilaginous fish and mammals.
(b) Reptiles and mammals.
(c) Birds and insects.
(d) Bony fish and lizards.

133. The factor that leads to the Founder's effect in a population is:
(a) Mutation
(b) Genetic drift
(c) Natural selection
(d) Genetic recombination

134. Germinal centres of lymph node and spleen perform which of the following function?
(a) Support the development of immature B and T cells.
(b) Function in the removal of damaged erythrocytes from the circulation.
(c) Act as the major source of stem cells and thus help to maintain haematopoiesis.
(d) These are sites of antigenic stimulation of mature B cells.

135. The type of cleavage found in mammalian embryo is:
(a) Planar cleavage
(b) Unequal cleavage
(c) Rotational cleavage
(d) Radial cleavage

136. Escherichia coli is used as an indicator organism to determine pollution of water with:
(a) Industrial effluents
(b) Heavy metals
(c) Pollen of aquatic plants
(d) Faecal matter

137. Certain bacteria living in the soil convert nitrates into nitrites and then to free nitrogen. Such bacteria are termed as:
(a) Nitrogen fixing bacteria
(b) Denitrifying bacteria
(c) Ammonifying bacteria
(d) Nitrifying bacteria

138. The prebiotic atmosphere of the earth was of a reducing nature. It was transformed into an oxidizing atmosphere of present day due to emergence of:
(a) Cyanobacteria
(b) Angiosperms
(c) Photosynthetic bacteria
(d) Eukaryotic algae

139. Fossils are generally found in:
(a) Sedimentary rocks
(b) Igneous rocks
(c) Metamorphic rocks
(d) Any type of rock

140. Which of the following is used as an atmospheric pollution indicator?
(a) Lepidoptera
(b) Lichens

(c) Lycopersicon
(d) Lycopodium

141. Kranz anatomy occurs in:
(a) Leaves
(b) Stem
(c) Flower
(d) Seed

142. Which one of the following is an example for homology?
(a) Eye of octopus and mammals.
(b) Wings of butterfly and birds.
(c) Flippers of penguins and dolphins.
(d) Thorns of Bougainvillea and tendrils of Cucurbita.

143. Hormone responsible for growth of the root in micropropagation is:
(a) Auxin
(b) Gibberellin
(c) Cytokinin
(d) Abscisic acid

144. Long plants are able to stand erect due to presence of:
(a) Sclerenchyma
(b) Collenchyma
(c) Parenchyma
(d) Prosenchyma

145. Which of the following reproduces sexually only once in its life time?
(a) Banana plant
(b) Mango
(c) Tomato
(d) Eucalyptus

146. Which one of the following is a breed of cattle?
(a) Ayrshire
(b) Ghagus
(c) Kadaknath
(d) Scampi

147. Which one of the following is a marine fish?
(a) Rohu
(b) Hilsa
(c) Catla
(d) Common carp

148. The male reproductive tract develops from:
(a) Mullerian duct
(b) Wolffian duct
(c) Paramesonephric duct
(d) Metanephric duct

149. Which of the following is the glycoprotein layer surrounding oocyte?
(a) Cumulus oophorus
(b) Theca Externa
(c) Theca Interna

(d) Zona Pellucida

150. Sebaceous glands secrete through which mode of secretion?
(a) Apocrine
(b) Merocrine
(c) Holocrine
(d) Cytocrine

ICMR-BRET-JRF 2022 ANSWER KEY

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