

POST OF JUNIOR SCIENTIFIC OFFICER IN TAMIL NADU  
FORENSIC SCIENCES SUBORDINATE SERVICE -2023

COMPUTER BASED TEST

PAPER -I

**BIOLOGY**

(P.G. DEGREE STANDARD)

1. Match the following and choose the correct option given below:
- |                              |                     |
|------------------------------|---------------------|
| (a) Tribolium Castaneum      | 1. Pulse beetles    |
| (b) Callosobruchus chinensis | 2. Red flour beetle |
| (c) Sitophilus oryzae        | 3. Rice meal moth   |
| (d) Corcyra cephalonica      | 4. Grannery weevil  |
- (a) (b) (c) (d)
- (A) 1 2 3 4
- (B) 2 1 4 3
- (C) 4 3 2 1
- (D) 1 2 4 3
- (E) Answer not known
2. Ants which makes nest near the walls of building are called
- (A) Camponotus compresses
- (B) Monomorium indicum
- (C) Solenopsis molesta
- (D) Monomorium Gracillimum
- (E) Answer not known
3. The pest pink bollworm is a native species of
- (A) Japan
- (B) India
- (C) Russia
- (D) America
- (E) Answer not known

4. In human the developing embryo is protected by
- (A) Pleural cavity
  - (B) Amniotic cavity
  - (C) Allantois
  - (D) Peritoneal cavity
  - (E) Answer not known
5. A mass of endoderm cell that protrudes through the blastopore constitutes
- (A) Blastopore
  - (B) Archenteron
  - (C) Yolk plug
  - (D) Blastocoel
  - (E) Answer not known
6. During the development of chick, the ectoderm differentiate into
- (A) Chorda-mesoderm
  - (B) Notochord
  - (C) Muscles
  - (D) Neural plate and epidermis
  - (E) Answer not known
7. In unfertilized egg masked RNA seems to originate from
- (A) Cytoplasm
  - (B) Nucleus
  - (C) Mitochondria
  - (D) Polar bodies
  - (E) Answer not known

8. The embryonic process which brings about the reorganization and displacement of organ forming areas
- (A) Gastrulation
  - (B) Cleavage
  - (C) Blastulation
  - (D) Fertilization
  - (E) Answer not known
9. The process in which the length of entire gastrula begins to elongate in the antero-posterior axis is called as
- (A) Divergence
  - (B) Extension
  - (C) Ingression
  - (D) Delamination
  - (E) Answer not known
10. Muscle fatigue is due to the accumulation of
- (A) Lactic acid
  - (B) Carbonic acid
  - (C) Citric acid
  - (D) Hydrochloric acid
  - (E) Answer not known

11. The air remaining in the lungs at the end of each normal expiration is called
- (A) Residual volume ratio
  - (B) Lung volume
  - (C) Pulmonary volume
  - (D) Functional residual capacity
  - (E) Answer not known
12. The overproduction of red blood cells due to myeloproliferative neoplasm is called
- (A) Primary polycythemia
  - (B) Secondary polycythemia
  - (C) Microcytic anaemia
  - (D) Normocytic Anaemia
  - (E) Answer not known
13. The state of muscles after death due to depletion of ATP is called
- (A) Heat rigor
  - (B) Rigor mortis
  - (C) Muscle fatigue
  - (D) Isotonic contraction
  - (E) Answer not known

14. The sudden onset and cessation of rapid heart rate is the clinical symptom of the disorder
- (A) Myocardial ischemia
  - (B) Extrasystole
  - (C) Paroxysmal Tachycardia
  - (D) Atrial flutter
  - (E) Answer not known
15. Choose the incorrect statement/s from the following.
- Statement I : When metabolism increases oxygen utilization also increases
- Statement II : The gaseous exchange occurs between the blood and tissues
- Statement III : Increased ventilation rate effectively increases oxygen uptake
- Statement IV : Increased ventilation rate effectively decreases oxygen uptake
- (A) I and II
  - (B) IV
  - (C) II and III
  - (D) I and III
  - (E) Answer not known

16. In human the distorted red blood cell with irregular thorn like projections are seen in the condition of

- (A) Microcytosis
- (B) Macrocytosis
- (C) Severe liver cirrhosis
- (D) Megaloblastic Anaemia
- (E) Answer not known

17. Match the following:

- |                    |                     |
|--------------------|---------------------|
| (a) Pancreas       | 1. ACTH             |
| (b) Leydig's cells | 2. Triiodothyronine |
| (c) Pituitary      | 3. Insulin          |
| (d) Thyroid        | 4. Androgen         |

- |                                         | (a)              | (b) | (c) | (d) |
|-----------------------------------------|------------------|-----|-----|-----|
| <input checked="" type="checkbox"/> (A) | 3                | 4   | 1   | 2   |
| (B)                                     | 3                | 1   | 4   | 2   |
| (C)                                     | 3                | 1   | 2   | 4   |
| (D)                                     | 3                | 2   | 4   | 1   |
| (E)                                     | Answer not known |     |     |     |

18. The chromosome which possess the rhythm gene in fruit fly

- (A) X Chromosome
- (B) Y Chromosome
- (C) First Autosome
- (D) Sixth Autosome
- (E) Answer not known

19. The process of ingestion of large sized solid substance by the cell is known as
- (A) Diwacocytosis
  - (B) Emeiocytosis
  - (C) Phagocytosis
  - (D) Colloidopexy
  - (E) Answer not known
20. The thick filaments of muscle cell contains a protein called
- (A) Actin
  - (B) Troponin
  - (C) Tropomyosin
  - (D) Myosin
  - (E) Answer not known
21. In field work practice the anthropologist becomes a 'doubly marginal' person, in a sense suspended between one's own society and the society under investigation.
- Who said this?
- (A) Evans-Pritchard
  - (B) Malinowski
  - (C) Westermarck
  - (D) Alan Barnard
  - (E) Answer not known

22. Understanding culture should focus on what people think about, their ideas, and the symbols and meanings that are important to them
- (A) Thick description
  - (B) Reflexivity
  - (C) Discourse analysis
  - (D) Interpretive anthropology
  - (E) Answer not known
23. Field work is important for anthropology, because
- (A) The only way they can get faith
  - (B) Moving out is a compulsion to them
  - (C) They cannot study the type of things they deal with in their libraries
  - (D) All of the above
  - (E) Answer not known
24. Who was the first scholar who emphasized the need of direct data collection in anthropology?
- (A) A.C. Haddon
  - (B) E.B. Tylor
  - (C) B. Malinowski
  - (D) W.H.R. Rivers
  - (E) Answer not known



25. Who conducted “Jessup North Pacific expedition” in 1897, the earliest attempt of professional data gathering
- (A) E.B. Tylor
  - (B) A.C. Haddon
  - (C) Franz Boas
  - (D) B. Malinowski
  - (E) Answer not known
26. Which among the following is the ethnology and ethnography of culture, which no longer exist?
- (A) Archaeology
  - (B) History
  - (C) Society
  - (D) Culture
  - (E) Answer not known
27. Participant observation suits anthropologists because
- (A) They are not in a haste
  - (B) Those who desire involvement with the people understudy
  - (C) Because it is convenient in the study of primitive societies
  - (D) None of the above
  - (E) Answer not known

28. Match the following :

- |                          |                                     |
|--------------------------|-------------------------------------|
| (a) Primary data         | 1. Interview                        |
| (b) Secondary data       | 2. Questionnaire                    |
| (c) Intensive field work | 3. Researcher collects himself      |
| (d) Survey               | 4. Collected from reference sources |

- |                | (a)              | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A)            | 4                | 1   | 2   | 3   |
| (B)            | 2                | 3   | 4   | 1   |
| (C)            | 1                | 2   | 3   | 4   |
| <del>(D)</del> | 3                | 4   | 1   | 2   |
| (E)            | Answer not known |     |     |     |

29. Applied anthropology is \_\_\_\_\_ than theoretical anthropology.

- (A) time consuming
- ~~(B)~~ collaborative
- (C) prestigious
- (D) all of the above
- (E) Answer not known

30. The sub field which considers how emerging technologies like immersive virtual reality, mobile apps, social networking etc. are reshaping anthropological research, practice and teaching

- (A) Visual Anthropology
- (B) Visual Ethnography
- ~~(C)~~ Multimodal Anthropology
- (D) Communication Anthropology
- (E) Answer not known

31. The analysis of the numerical features of a population constitutes the discipline of
- (A) Dermatography
  - (B) Economics
  - (C) Demography
  - (D) Ethnology
  - (E) Answer not known
32. "Hindu methods of Tribal Absorption" is the work of
- (A) Majumdar
  - (B) Srinivas
  - (C) Bose
  - (D) None of the above
  - (E) Answer not known
33. Culture has been defined by Marret as
- (A) the sum total of social structure
  - (B) the systems of meanings and symbols
  - (C) communicable intelligence
  - (D) societal interrelations
  - (E) Answer not known
34. Who pointed out that anthropology and sociology are twin sisters?
- (A) A.L. Kroeber
  - (B) E.B. Tylor
  - (C) Charles Darwin
  - (D) C.W. Watson
  - (E) Answer not known

35. The anthropologist who argued against its employment in urban researches
- (A) Gulliver
  - (B) Gutkind
  - (C) Des Peres
  - (D) Kemper
  - (E) Answer not known
36. Which among the following is related to A.L. Kroeber?
- (A) History and Science in Anthropology
  - (B) Anthropologist looks at History
  - (C) Both (A) and (B)
  - (D) Neither (A) nor (B)
  - (E) Answer not known
37. Which of the following discipline combines the approaches of both the biological and social sciences?
- (A) Sociology
  - (B) Anthropology
  - (C) Physiology
  - (D) Geography
  - (E) Answer not known
38. 'The Argonauts of Western Pacific' was written by
- (A) F. Boas
  - (B) A.C. Haddan
  - (C) B. Malinowski
  - (D) A.R. Radcliffe Brown
  - (E) Answer not known

39. Who defined Anthropology as the 'Science of Man and his Works'?

- (A) M.J. Herskowitz
- (B) E. Evans Pritchard
- (C) S.F. Nadel
- (D) Raymond Firth
- (E) Answer not known

40. Match the following :

- |                   |                                               |
|-------------------|-----------------------------------------------|
| (a) S.C. Roy      | 1. Father of Indian Ethnology                 |
| (b) William Jones | 2. Asiatic Society of Bengal (1748)           |
| (c) Edward Tylor  | 3. The First Academic Position                |
| (d) Malinowski    | 4. Transformed the field work in Anthropology |

- |                | (a)              | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A)            | 4                | 3   | 1   | 2   |
| <del>(B)</del> | 1                | 2   | 3   | 4   |
| (C)            | 3                | 4   | 2   | 1   |
| (D)            | 2                | 3   | 4   | 1   |
| (E)            | Answer not known |     |     |     |

41. A dye which can detect protein bands on Gel Electrophoresis is

- (A) Coomassie blue
- (B) Radiant red
- (C) Ethidium bromide
- (D) Methylene blue
- (E) Answer not known

42. The radioactivity in a sample is measured at the end of radio immunoassay procedure by
- (A) Bound labelled antigen
  - (B) Unbound labelled antigen
  - (C) Labelled antibody
  - (D) Unlabelled antibody
  - (E) Answer not known
43. Which of the following pairs are matched correctly?
- (i) Sandwich ELISA – Detect antigens
  - (ii) Competitive ELISA – Measure antigens
  - (iii) Indirect ELISA – Detect antibodies
  - (iv) Direct ELISA – Secondary antibody not required
- (A) (i) and (ii) are correct
  - (B) (iii) and (iv) are correct
  - (C) (i), (ii), (iii) are correct
  - (D) (i), (ii), (iii) and (iv) are correct
  - (E) Answer not known
44. In Elisa technique, which among the following is not a substrate for HRP enzyme?
- (A) 2, 2, azo-bis 3 ethyl benzthiazoline 6-sulfonic acid
  - (B) O-Phenylenediamine
  - (C) 3,5,5 tetramethylbenzidine
  - (D) p-nitrophenyl phosphate
  - (E) Answer not known

45. The approach by which RFLP is a very powerful and has helped many genes to be mapped on the
- (A) DNAs
  - (B) Chromosomes
  - (C) RNAs
  - (D) Proteins
  - (E) Answer not known
46. The centre for cellular and molecular biology, developed the 'BKM-derived Probe' for DNA fingerprinting from which of the Indian poisonous snake?
- (A) Naja Naja
  - (B) Russel's viper
  - (C) Bungarus fasciatus
  - (D) Hydrophis
  - (E) Answer not known
47. Which one of the following is true regarding the activity of the enzyme DNA polymerase used in PCR technique?
- (A) The enzyme is active at high temperatures
  - (B) It has been isolated from bacteria thriving in cold regions
  - (C) It ligates the introduced DNA in recipient cells
  - (D) Serves as a selectable marker
  - (E) Answer not known

48. Efficient thermostable enzymes vent polymerase was isolated from
- (A) *Thermus aquaticus*
  - (B) *Pyrococcus furiosus*
  - (C) *Thermococcus litoralis*
  - (D) *Agrobacterium rhizogenes*
  - (E) Answer not known
49. The Mitotic stage of a cell preferably used for fluorescent in situ hybridization (FISH). Studies is
- (A) Leptotene
  - (B) Prophase
  - (C) Metaphase
  - (D) Telophase
  - (E) Answer not known
50. Amniocentesis technique is used to determine the health of an
- (A) Infant
  - (B) Unborn Baby
  - (C) Adult Male
  - (D) Adult Female
  - (E) Answer not known
51. Which immunoglobulin involves in hyper sensitivity reaction?
- (A) Ig G
  - (B) Ig A
  - (C) Ig E
  - (D) Ig M
  - (E) Answer not known



52. Match the following :

- |                          |               |
|--------------------------|---------------|
| (a) Apis indica          | 1. Dammer bee |
| (b) Apis dorsata         | 2. Little bee |
| (c) Apis Florea          | 3. Indian bee |
| (d) Melipona iridipennis | 4. Rock bee   |

- |                                      | (a)              | (b) | (c) | (d) |
|--------------------------------------|------------------|-----|-----|-----|
| <input checked="" type="radio"/> (A) | 3                | 4   | 2   | 1   |
| (B)                                  | 1                | 3   | 4   | 2   |
| (C)                                  | 2                | 1   | 3   | 4   |
| (D)                                  | 4                | 2   | 1   | 3   |
| (E)                                  | Answer not known |     |     |     |

53. All are bactericidal compounds in phagocytic neutrophils, except

- (A) Singlet oxygen
- (B) Hydroxyl radicals
- (C) Hydrogen peroxide
- (D) Cathepsin K
- (E) Answer not known

54. The type of antigen present in the RBC of an individual who possess IOIO genotype is

- (A) 'A' antigen
- (B) 'B' antigen
- (C) 'A' and 'B' antigen
- (D) No antigen
- (E) Answer not known

55. The light chain of human immunoglobulins is composed of about
- (A) 208 to 210 amino acids
  - (B) 178 to 187 amino acids
  - (C) 198 to 206 amino acids
  - (D) 211 to 217 amino acids
  - (E) Answer not known
56. Which one of the following plasma proteins is involved in the coagulation of Blood?
- (A) Globulin
  - (B) Albumin
  - (C) Fibrinogen
  - (D) Serum amylase
  - (E) Answer not known
57. Haemophilia-A occurs due to
- (A) Absence of clotting factor IX
  - (B) Absence of clotting factor VIII
  - (C) Absence of clotting factor X
  - (D) Absence of clotting factor VII
  - (E) Answer not known
58. Which of this is not a red blood cell abnormality seen on stained blood smear
- (A) Hypochromia
  - (B) Macrocytosis
  - (C) Microcytosis
  - (D) Pappenheimer bodies
  - (E) Answer not known

59. Why Ammonium oxalate is not used in PCV and ESR tests?

- (A) It causes swelling of RBC
- (B) It causes coagulation
- (C) It causes hemolysis
- (D) It causes of shrinkage of RBC
- (E) Answer not known

60. Inclusion bodies which are present in Red Blood Corpuscles are

- (A) Granular casts
- (B) Howell Jolly bodies
- (C) Hyaline cast
- (D) Thorn apple crystals
- (E) Answer not known

61. Match the following :

- |                                 |                  |
|---------------------------------|------------------|
| (a) Citrus                      | 1. Cercospora    |
| (b) Blast of rice               | 2. Xanthomonas   |
| (c) Tikka disease of ground nut | 3. Tobacco virus |
| (d) Leaf curl of papaya         | 4. Pyricularia   |

- |                                         | (a)              | (b) | (c) | (d) |
|-----------------------------------------|------------------|-----|-----|-----|
| (A)                                     | 1                | 2   | 3   | 4   |
| (B)                                     | 3                | 1   | 4   | 2   |
| <input checked="" type="checkbox"/> (C) | 2                | 4   | 1   | 3   |
| (D)                                     | 2                | 3   | 1   | 4   |
| (E)                                     | Answer not known |     |     |     |

62. Match the following :

- (a) Blast
- (b) Blight
- (c) Tungro
- (d) Ufra

- 1. Ditylenchus
- 2. Virus
- 3. Xanthomonas
- 4. Pyricularia

- |                | (a)              | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A)            | 3                | 4   | 1   | 2   |
| <del>(B)</del> | 4                | 3   | 2   | 1   |
| (C)            | 4                | 3   | 1   | 2   |
| (D)            | 3                | 4   | 2   | 1   |
| (E)            | Answer not known |     |     |     |

63. During invasion, adhesion of bacteria is achieved through structures like

- (A) Flagella
- ~~(B)~~ Fimbriae and Pili
- (C) Capsule
- (D) Cell wall
- (E) Answer not known

64. Identify the dual enzyme from the following

- (A) PEP case
- ~~(B)~~ RuBP case
- (C) Carbonic anhydrase
- (D) Urease
- (E) Answer not known

65. Select the correct statement

- (i) All enzymes are proteins but not all proteins are enzymes
  - (ii) Each enzyme catalyze a specific chemical reaction
  - (iii) Each enzyme has always only one active site
  - (iv) Enzymes are thermoliable and pH sensitive
- (A) (i), (ii), (iii), (iv)  
(B) (i), (ii), (iii)  
(C) (i), (iii), (iv)  
 (D) (i), (ii), (iv)  
(E) Answer not known

66. Which of the following pigments do not absorb light energy in the green part of the spectrum?

- (A) Carotenes
- (B) Xanthophylls
- (C) Phycoerythrins
- (D) Phycocyanins
- (E) Answer not known

67. Which among the following enzyme is vital for Tricarboxylic Acid (TCA) cycle?

- (A) Glycolic Acid oxidase
- (B) Flavin oxidase
- (C) Pyruvic dehydrogenase
- (D) Succinic dehydrogenase
- (E) Answer not known

68. Three dimensional structure of fossils preserved in a matrix of silica, calcite or dolomite is called

- (A) Casts
- (B) Impressions
- (C) Petrifications
- (D) Molds
- (E) Answer not known

69. Jurassic period belongs to \_\_\_\_\_ Era.

- (A) Cenozoic era
- (B) Mesozoic era
- (C) Paleozoic era
- (D) Protozoic era
- (E) Answer not known

70. Match the terms in the spikelet of graminaceae

- |           |                  |
|-----------|------------------|
| (a) Axis  | 1. Bracteole     |
| (b) Lemma | 2. Rachilla      |
| (c) Palea | 3. Sterile bract |
| (d) Glume | 4. Fertile bract |

- |                                         | (a)              | (b) | (c) | (d) |
|-----------------------------------------|------------------|-----|-----|-----|
| (A)                                     | 2                | 1   | 4   | 3   |
| (B)                                     | 3                | 1   | 2   | 4   |
| <input checked="" type="checkbox"/> (C) | 2                | 4   | 1   | 3   |
| (D)                                     | 2                | 3   | 4   | 1   |
| (E)                                     | Answer not known |     |     |     |

71. In dicots, highly evolved family is
- (A) Combretaceae
  - (B) Cucurbitaceae
  - (C) Araliaceae
  - (D) Asteraceae
  - (E) Answer not known
72. The Father of Botany is
- (A) Theophrastus
  - (B) Jean Bauhin
  - (C) Bentham and Hooker's
  - (D) Engler and Prantl
  - (E) Answer not known
73. The Ribosomal RNAs present in 80s Ribosome are
- (A) 23 S rRNA, 16S rRNA 5S rRNA, 5.8S rRNA
  - (B) 28S rRNA, 18S rRNA, 5S rRNA, 5.8S rRNA
  - (C) 23S rRNA, 18 S rRNA, 5S rRNA 5.8S rRNA
  - (D) 28S rRNA, 16S rRNA 5S rRNA, 5.8S rRNA
  - (E) Answer not known
74. Eukaryotic organisms are
- (A) Bacteria
  - (B) Virus
  - (C) Plants and Animals
  - (D) Mycoplasmas
  - (E) Answer not known

75. The name, chromosome was coined by
- (A) Fleming
  - (B) Waldeyer
  - (C) Brown
  - (D) Svedberg
  - (E) Answer not known
76. The endoplasmic reticulum was discovered by
- (A) Porter
  - (B) Camillo
  - (C) Palade
  - (D) Brown
  - (E) Answer not known
77. Litmus paper is prepared from
- (A) Lobaria Pulmonaria
  - (B) Lasallia pustulata
  - (C) Ochrolechia androgyna
  - (D) Parmelia omphalodes
  - (E) Answer not known
78. 'Dikaryons' in secondary mycelium of Ascomycetes is facilitated by
- (A) Hook cell
  - (B) Crozier connection
  - (C) Rhizines
  - (D) Coenozygote
  - (E) Answer not known



79. The oldest species of vascular plant that is in existence is
- (A) Lycopodium phlagmerium
  - (B) Ginko biloba
  - (C) Cycas circinalis
  - (D) Selaginella lepidophylla
  - (E) Answer not known
80. The seed of Ephedra is enclosed by
- (A) Single envelope
  - (B) Two envelopes
  - (C) Three envelopes
  - (D) No envelopes
  - (E) Answer not known
81. Rajaji National Park is in \_\_\_\_\_ state.
- (A) Uttar Pradesh
  - (B) Tamil Nadu
  - (C) Karnataka
  - (D) Uttarkhand
  - (E) Answer not known
82. Epiphytic plants collecting large quantity of humus and water are known as
- (A) Tank epiphytes
  - (B) Proto epiphytes
  - (C) Hemi epiphytes
  - (D) Nest epiphytes
  - (E) Answer not known

83. An ecosystem has the maximum biomass is
- (A) Grassland ecosystem
  - (B) Forest ecosystem
  - (C) Pond ecosystem
  - (D) Lake ecosystem
  - (E) Answer not known
84. The largest mangrove vegetation in India is seen in
- (A) West Bengal
  - (B) Tamil Nadu
  - (C) Goa
  - (D) Kerala
  - (E) Answer not known
85. The term Ethnobotany was first coined by
- (A) Harshberger
  - (B) Wassion
  - (C) Mehra
  - (D) Borthakur
  - (E) Answer not known
86. The Institute of "Wood Science and Technology" (IWST) is located in
- (A) Coimbatore
  - (B) Dehradun
  - (C) Bengaluru
  - (D) Jorhant
  - (E) Answer not known

87. Commercially Green colour dye is obtained from
- (A) *Lawsonia inermis*
  - (B) *Memecylon umbellatum*
  - (C) *Jatropha glandulifera*
  - (D) *Ilex aquifolium*
  - (E) Answer not known
88. Tung oil, very much useful in \_\_\_\_\_ Industry.
- (A) Food
  - (B) Dye
  - (C) Paint
  - (D) Chemical
  - (E) Answer not known
89. The following statement is not correct with regard to the characteristic feature of tannins?
- (A) Tannins are glycosidal compounds
  - (B) Tannins are astringent
  - (C) Tannins are colourless solids
  - (D) Tannins are inorganic compounds
  - (E) Answer not known
90. RAPD techniques was developed by
- (A) Jeffrey et al
  - (B) Litt et al
  - (C) Williams et al
  - (D) Olson et al
  - (E) Answer not known

91. Who among the following is discovery of crossing over in living organisms?
- (A) Janssens
  - (B) Morgan
  - (C) Sutton
  - (D) Mendel
  - (E) Answer not known
92. Total number of linkage groups present in maize are
- (A) 20
  - (B) 5
  - (C) 10
  - (D) 15
  - (E) Answer not known
93. Find out the correct statement in the following :
- (1) Tapetum attains its maximum development in diad stage
  - (2) Tapetum attains its maximum development in tetrad stage
  - (3) Tapetum is single layered
  - (4) Tapetum is multi layered
- (A) (1) and (3) true, (2) and (4) wrong
  - (B) (2) and (3) true, (1) and (4) wrong
  - (C) (1) and (4) true, (2) and (3) wrong
  - (D) (2) and (4) true, (1) and (3) wrong
  - (E) Answer not known

94. Point out the wrong statement in the following :
- (A) Two sperms fertilize two different components of the embryo sac
  - (B) Most of the plants have three polar nuclei
  - (C) Sperms released by a pollen tube
  - (D) The nucleus of one of the sperm fuse with the egg nucleus
  - (E) Answer not known
95. During the process of fertilization, the pollen tube of pollen enters through integument is called
- (A) Mesogamy
  - (B) Porogamy
  - (C) Morphogenesis
  - (D) Chalazogamy
  - (E) Answer not known
96. In plant embryology, the NPC system is related to
- (A) Flower
  - (B) Ovule
  - (C) Pollengrain
  - (D) Anther
  - (E) Answer not known
97. Secondary growth is anomalous in
- (A) Dracaena
  - (B) Annona
  - (C) Tridax
  - (D) Hibiscus
  - (E) Answer not known

98. The activities takes place during the G<sub>2</sub> phase of the cell cycle is
- (A) Synthesis and organization of the substrates necessary for the DNA synthesis
  - (B) Replication of DNA
  - (C) Metabolic activities concerning the growth of cytoplasm and other cell organelles
  - (D) Fragmentation of nucleus
  - (E) Answer not known
99. In \_\_\_\_\_ stomatal type, the stoma is surrounded by three subsidiary cells.
- (A) Ranunculaceous (or) Anomocytic
  - (B) Cruciferous (or) Anisocytic
  - (C) Rubiaceous (or) Paracytic
  - (D) Caryophyllaceous (or) Diacytic
  - (E) Answer not known
100. The Histogen theory was proposed by
- (A) Hanstein
  - (B) Hofmeister
  - (C) Nageli
  - (D) Schmidt
  - (E) Answer not known
101. Find out the bacteria, not causing nosocomical diseases in human
- (A) Escherichia coli
  - (B) Tubercle Bacilli
  - (C) Diphtheria bacilli
  - (D) Hemolytic streptococci
  - (E) Answer not known

102. Hydrophobia is also known as

- (A) Anaplasmosis                      ~~(B) Rabies~~  
(C) Q-fever                              (D) Psittacosis  
(E) Answer not known

103. The West Nile fever was first discovered in which country?

- (A) Ethiopia                              ~~(B) Uganda~~  
(C) Kenya                                (D) Zimbabwe  
(E) Answer not known

104. Toxin of the anthrax targets \_\_\_\_\_ in the human body.

- (A) Eyes                                    (B) Tongue  
~~(C) Skin~~                                    (D) Gonads  
(E) Answer not known

105. The infections contracted in a hospital

- (A) Microbial infections                (B) Zoonotic infections  
~~(C) Nosocomial infections~~            (D) Water-borne infections  
(E) Answer not known

106. HEPA filters in Laminar Air Flow Chamber is filled with \_\_\_\_\_ to filter bacterial cells.

- (A) Asbestos                                (B) Diatomaceous earth  
~~(C) Fiber glass~~                            (D) Porcelain  
(E) Answer not known

107. The Pyrogallol absorb method in Anaerobic culture was first introduced by
- (A) Buchner (B) Koch  
(C) Williams (D) Butler  
(E) Answer not known
108. \_\_\_\_\_ require low levels of oxygen for growth but cannot tolerate the level of oxygen present in an air atmosphere.
- (A) Aerobic bacteria  
(B) Anaerobic bacteria  
(C) Facultatively anaerobic bacteria  
(D) Microaerophilic bacteria  
(E) Answer not known
109. \_\_\_\_\_ are antimicrobial agents that are applied to non-living objects to destroy microorganisms.
- (A) Disinfectants (B) Antibiotics  
(C) Bactericides (D) Antiseptics  
(E) Answer not known
110. Lyophilization of microbes are frozen at \_\_\_\_\_ temperatures.
- (A)  $-10$  to  $-20^{\circ}\text{C}$  (B)  $-60$  to  $-78^{\circ}\text{C}$   
(C)  $-100$  to  $-150^{\circ}\text{C}$  (D)  $-160$  to  $-196^{\circ}\text{C}$   
(E) Answer not known





115. A microscope which creates a 3-D image from electrons emitted from the surface of the specimen are known as
- (A) Scanning electron microscope
  - (B) Scanning tunneling microscope
  - (C) Transmission electron microscope
  - (D) Confocal scanning microscope
  - (E) Answer not known
116. The theory of spontaneous generation states that the
- (A) Microbes is regularly found in the lesion of the disease
  - (B) Microbes can be isolated in pure culture
  - (C) Inoculation of this culture produces a similar disease in experiments on animals
  - (D) Microbes arise automatically in decomposing organic matter.
  - (E) Answer not known
117. \_\_\_\_\_ is called as “Father of Modern Microbiology”.
- (A) Anton Van Leeuwenhoek
  - (B) Louis Pasteur
  - (C) Edward Jenner
  - (D) Robert Koch
  - (E) Answer not known
118. Alexander Fleming discovered penicillin from the molds was inhibiting the growth of bacterium
- (A) Bacillus
  - (C) Staphylococcus
  - (B) Penicillium
  - (D) Enterobacter
  - (E) Answer not known

119. Viruses were first crystallized by

- (A) Roux
- (B)  Stanley
- (C) Ivanowsky
- (D) Twort
- (E) Answer not known

120. In which combination all are not a vegetative propagate of lichen

- (A) Phyllidia, Schizidia, Isidia
- (B)  Gonocyst, Hormocyst, Heterocyst
- (C) Soredia, Blastidia, Cephalodia
- (D) Hormocyst, Cyphellae, Schizidia
- (E) Answer not known

121. Apoenzyme and the coenzyme together constitute

- (A) Isoenzyme
- (B)  Holoenzyme
- (C) Active enzyme
- (D) Bound enzyme
- (E) Answer not known

122. Match the following steroids with their respective carbon group :

Steroids	No. of Carbons
(a) Androgens	1. C 18
(b) Estrogens	2. C 19
(c) Progesterone	3. C 26
(d) Aldosterone	4. C 21
	5. C 21

	(a)	(b)	(c)	(d)
(A)	2	1	4	3
(B)	2	4	3	5
(C)	1	2	5	4
<del>(D)</del>	2	1	4	5
(E)	Answer not known			

123. The active form of male sex hormone metabolite in tissues where they exert their effect is

- (A) Androstenedione                      ~~(B) Dihydrotestosterone~~  
(C) Testosterone                          (D) Androsterone  
(E) Answer not known

124. Lock and key model for mechanism of enzyme action explained by

- (A) Jacques Monod                      ~~(B) Emil Fischer~~  
(C) Koshland Sumner                      (D) Edward Buchner  
(E) Answer not known

125. Two important enzymes in the diagnosis of myocardial infraction

- ~~(A)~~ LDH<sub>1</sub> and CPK<sub>2</sub>                      (B) LDH<sub>3</sub> and CPK<sub>1</sub>  
(C) LDH<sub>4</sub> and CPK<sub>2</sub>                      (D) LDH<sub>5</sub> and CPK<sub>3</sub>  
(E) Answer not known

126. The Eukaryotic mRNA is capped at the 5' terminal end by
- (A) 7-methyl guanosine triphosphate
  - (B) Formamide
  - (C) 6-mercaptapurine
  - (D) 8 aza-guanine
  - (E) Answer not known
127. 2, 4 dioxy 5 methyl pyrimidine is
- (A) Thymine
  - (B) Uracil
  - (C) Cytosine
  - (D) Guanine
  - (E) Answer not known
128. Small nucleolar RNA (Sno RNA) is involved in
- (A) Processing of mRNA molecules
  - (B) Processing of rRNA molecules
  - (C) Serve as percussor of mRNA synthesis
  - (D) Regulates mRNA synthesis
  - (E) Answer not known
129. Guanosine residues which can pair with cytidine residues if protonated on a third DNA strand is by hydrogen bonding is
- (A) Hoogsteen positions
  - (B) Mirror repeat
  - (C) Cruciform structures
  - (D) Inverted repeats
  - (E) Answer not known

130.  $T_3$  and  $T_4$  mediate their biological actions through

- (A) Cell surface receptors
- (B) Intracellular receptors
- (C) Toll receptors
- (D) Tyrosine Kinase receptors
- (E) Answer not known

131. Cerebrosides are

- (A) glycolipids
- (B) phospholipids
- (C) lipoproteins
- (D) sulfolipids
- (E) Answer not known

132. Which of the following is not an aromatic amino acid?

- (A) Phenylalanine
- (B) Tyrosine
- (C) Tryptophan
- (D) Proline
- (E) Answer not known

133. Match the following type of amino acid with their examples from the given options :

- |                        |                  |
|------------------------|------------------|
| (a) Imino acid         | 1. Aspartic acid |
| (b) Neutral amino acid | 2. Lysine        |
| (c) Acidic amino acid  | 3. Boline        |
| (d) Basic amino acid   | 4. Serine        |

- |     | (a)              | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 3                | 1   | 4   | 2   |
| (B) | 3                | 4   | 2   | 1   |
| (C) | 3                | 4   | 1   | 2   |
| (D) | 4                | 1   | 2   | 3   |
| (E) | Answer not known |     |     |     |

134. An amino acid required for the synthesis of catecholamines
- (A) Tryptophan                      ~~(B) Tyrosine~~  
(C) Methionine                      (D) Phenylalanine  
(E) Answer not known
135. Between which carbon a double bond is present in cholesterol molecule
- (A) C<sub>4</sub> and C<sub>5</sub>                      ~~(B) C<sub>5</sub> and C<sub>6</sub>~~  
(C) C<sub>3</sub> and C<sub>4</sub>                      (D) C<sub>6</sub> and C<sub>7</sub>  
(E) Answer not known
136. Which of the following is not a test employed to identify reducing action of sugars?
- (A) Benedict's test                      (B) Fehling's test  
(C) Barfoed's test                      ~~(D) Molisch test~~  
(E) Answer not known
137. Glucocorticoids promotes the activity of enzymes in the synthesis of glucose by the process of
- ~~(A) Gluconeogenesis~~                      (B) HMP shunt  
(C) Glycogenesis                      (D) Glycogenolysis  
(E) Answer not known
138. The structural polysaccharide found in the exoskeleton of insects are
- (A) Heparin                      ~~(B) Chitin~~  
(C) Dextran                      (D) Glycogen  
(E) Answer not known





143. The strength of linkage is related inversely to distance between
- (A) centromeres
  - (C) genes
  - (E) Answer not known
  - (B) telomeres
  - (D) chromosomes
144. Human Genome Project took off on
- (A) October 1, 1990
  - (C) November 1, 1992
  - (E) Answer not known
  - (B) October 10, 1990
  - (D) October 1, 1992
145. \_\_\_\_\_ is the animal populations that are isolated through different mating behaviours.
- (A) Habitat isolation
  - (C) Ethological isolation
  - (E) Answer not known
  - (B) Temporal isolation
  - (D) Mechanical isolation
146. In the primitive environment of earth bacterio chlorophyll was synthesized from \_\_\_\_\_ of ocean water.
- (A) Iron Porphyrin
  - (C) Copper Porphyrin
  - (E) Answer not known
  - (B) Magnesium Porphyrin
  - (D) Manganese Porphyrin
147. The cranial capacity of South African ape man was
- (A) 1350 – 1400 CC
  - (C) 450 – 600 CC
  - (E) Answer not known
  - (B) 1150 – 1300 CC
  - (D) 600 – 750 CC

148. In Paleozoic era which period was called as age of fishes

- (A) Cambrian
- (B) Devonian
- (C) Silurian
- (D) Carboniferous
- (E) Answer not known

149. Germplasm theory was proposed by

- (A) Hugo De Vries
- (B) Haeckel
- (C) August Weismann
- (D) Muller
- (E) Answer not known

150. The sugar present in the honey is

- (A) glucose
- (B) maltose
- (C) levulose
- (D) cellulose
- (E) Answer not known

151. The largest honeybee is

- (A) Apis indica
- (B) Apis mellifera
- (C) Apis dorsata
- (D) Apis florea
- (E) Answer not known

152. Match the following :

- |                                  |                      |
|----------------------------------|----------------------|
| (a) <u>Chilo polychrysa</u>      | 1. Pest of sugarcane |
| (b) <u>Chilo infuscatellus</u>   | 2. Pest of coconut   |
| (c) <u>Platyedra gossypiella</u> | 3. Pest of paddy     |
| (d) <u>Oryctes rhinoceros</u>    | 4. Pest of cotton    |

- |                | (a)                | (b) | (c) | (d) |
|----------------|--------------------|-----|-----|-----|
| (A)            | 3                  | 4   | 2   | 1   |
| <del>(B)</del> | 3                  | 1   | 4   | 2   |
| (C)            | 4                  | 3   | 2   | 1   |
| (D)            | 2                  | 1   | 4   | 3   |
| (E)            | . Answer not known |     |     |     |

153. A bee has flown about 3 km from its hive, her direction of returning to the hive will depend on the

- (A) Position of sun
- (B) Memory of the route
- (C) Visibility of the hive
- ~~(D)~~ Attraction towards the smell of the hive
- (E) Answer not known

154. Silk thread is made of fine filaments which are struck together by

- (A) Glue
- (B) Wax
- ~~(C)~~ Sericin
- (D) Secretin
- (E) Answer not known

155. The plants that yield nectar and pollen for honey bees are collectively known as
- (A) Bee pasturage
  - (B) Bee plants
  - (C) Honey plants
  - (D) Dearth plants
  - (E) Answer not known
156. In which of the following phylum, the largest number of animal species are included?
- (A) Insecta
  - (B) Protozoa
  - (C) Mammalia
  - (D) Arthropoda
  - (E) Answer not known
157. If two fusing nuclei are present in two different cells, then the process is known as
- (A) Autogamy
  - (B) Hologamy
  - (C) Paedogamy
  - (D) Syngamy
  - (E) Answer not known

158. Main characteristics of Arthropoda are

- (A) Chitinous endoskeleton, external segmentation and jointed legs
- (B) External segmentation, hair and 3 pairs of legs
- (C) External skeletal scales, segmentation and a pair of antennae
- (D) External segmentation, one pair chelicerae and a pair of pedipalpi
- (E) Answer not known

159. The book "Systema Naturae" was published by

- (A) John Ray
- (B) Linnaeus
- (C) Ernst Haeckel
- (D) Julian Huxley
- (E) Answer not known

160. Which of the following taxons composed of many number of organisms

- (A) Species
- (B) Genus
- (C) Phylum
- (D) Order
- (E) Answer not known

161. The animals which are found all over the world are said to have \_\_\_\_\_ distribution.

- (A) Geographical distribution
- (B) Bathymetric distribution
- (C) Cosmopolitan distribution
- (D) Bipolar distribution
- (E) Answer not known

162. Ectomorphy is related to

- (A) Obesity
- (B) Dermatoglyphics
- (C) Serology
- ~~(D)~~ Body physique
- (E) Answer not known

163. Monosomics refers to

- ~~(A)~~ one entire chromosome of a homologous set is missing
- (B) variation in one gene of a chromosome
- (C) addition of one entire chromosome of a homologous set
- (D) representation of each chromosome of entire set may be represented singly
- (E) Answer not known

164. The instrument is used for taking various angular measurements on the face and skull is

- (A) Anthropometer Rod
- (B) Tape
- ~~(C)~~ Goniometer
- (D) Sliding caliper
- (E) Answer not known

165. Mendel's laws of heredity can be explained with the help of

- (A) Mitosis
- ~~(B)~~ Meiosis
- (C) Both (A) and (B)
- (D) None of the above
- (E) Answer not known

166. Match the following :

- |                           |                         |
|---------------------------|-------------------------|
| (a) Karyotype             | 1. PTC taste ability    |
| (b) Qualitative character | 2. Finger pattern types |
| (c) Complex disease       | 3. Set of chromosome    |
| (d) Monogenic             | 4. Diabetes             |

- |                | (a)              | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A)            | 1                | 4   | 2   | 3   |
| (B)            | 3                | 1   | 2   | 4   |
| <del>(C)</del> | 3                | 2   | 4   | 1   |
| (D)            | 2                | 4   | 3   | 1   |
| (E)            | Answer not known |     |     |     |

167. Match the following :

- |                       |                            |
|-----------------------|----------------------------|
| (a) Main line index   | 1. Pigmentation            |
| (b) Colour blindness  | 2. Land Steiner and Weiner |
| (c) Skin colour       | 3. Sex linked trait        |
| (d) The Rhesus system | 4. Dermatoglyphics         |

- |                | (a)              | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A)            | 4                | 1   | 3   | 2   |
| <del>(B)</del> | 4                | 3   | 1   | 2   |
| (C)            | 1                | 4   | 2   | 3   |
| (D)            | 2                | 3   | 1   | 4   |
| (E)            | Answer not known |     |     |     |

168. Thalassaemia syndrome is related to

- (A) Baldness
- (B) Huntington's disease
- (C) XXY
- (D) Malaria
- (E) Answer not known

169. Factors behind the formation of racial groups

- (A) Natural selection
- (B) Genetic drift
- (C) Population mixture
- (D) All of the above
- (E) Answer not known

170. Racial classification based on cephalic Index was proposed by

- (A) A.C. Haddon
- (B) H.H. Risley
- (C) B.S. Guha
- (D) S.S. Sarkar
- (E) Answer not known

171. Who among the following gave "Racial theory"?

- (A) Nesfield
- (B) Risley
- (C) G.S. Ghurye
- (D) S.C. Roy
- (E) Answer not known



172. Immediate response on exposure to cold environment involves

- (A) Thermogenesis
- (B) Vasodilation
- (C) Homeostasis
- (D) Vasoconstriction
- (E) Answer not known

173. Which among the following work is related to Tanner?

- (A) Fingerprints, palms and soles
- (B) Growth at adolescence
- (C) On the origin of species
- (D) Reconstructing human origins
- (E) Answer not known

174. Suborder Anthroipoidea consists of

- (A) Monkey, apes and man
- (B) Monkey and apes only
- (C) Monkey only
- (D) Apes only
- (E) Answer not known

175. Old World Monkey refer to

- (A) Platyrrhine
- (B) Catarrhine
- (C) Prosimian
- (D) None of the above
- (E) Answer not known

176. Neanderthal flourished during

- (A) Lower Palaeolithic period
- (B) Middle Palaeolithic period
- (C) Upper Palaeolithic period
- (D) Mesolithic period
- (E) Answer not known

177. The Scientist provided evidence against spontaneous origin of Microorganism

- (A) Francesco Redi
- (B) Leeuwenhoek
- (C) Louis Pasteur
- (D) Carl Linnaeus
- (E) Answer not known

178. Match the following :

- |                  |              |
|------------------|--------------|
| (a) La Moustier  | 1. Palestine |
| (b) La Ferrassic | 2. Charente  |
| (c) La Quina     | 3. Dordogne  |
| (d) Gailee       | 4. Dordogne  |

- |                                         | (a)              | (b) | (c) | (d) |
|-----------------------------------------|------------------|-----|-----|-----|
| (A)                                     | 2                | 3   | 1   | 4   |
| (B)                                     | 1                | 2   | 3   | 4   |
| <input checked="" type="checkbox"/> (C) | 3                | 4   | 2   | 1   |
| (D)                                     | 3                | 2   | 4   | 1   |
| (E)                                     | Answer not known |     |     |     |

179. The author of the book "The Descent of Man".
- (A) Charles Darwin
  - (B) Louis Dollo
  - (C) Dr. Robert Broom
  - (D) Raymond Dart
  - (E) Answer not known
180. Feaux & Hardy (Archaeologist) were related to the discovery of
- (A) The Chancelade Man
  - (B) The Cro-Magnon Man
  - (C) The Grimaldi Man
  - (D) The Neanderthal Man
  - (E) Answer not known
181. The protein that confers the Pesticidal potential to the biopesticide Bacillus thuringiensis is
- (A) trp
  - (B) lac
  - (C) cry
  - (D) rbc
  - (E) Answer not known
182. The \_\_\_\_\_ method is most suitable for small and marginal farmers for the preparation of biofertilizer.
- (A) Cemented tank
  - (B) Shallow metal
  - (C) Polythene lined pit
  - (D) Field
  - (E) Answer not known

183. Azolla is used as biofertilizer as it has

- (A) Mycorrhiza
- (B) Cyanobacterium
- (C) Rhizobium
- (D) Large amount of humus
- (E) Answer not known

184. The Insulin extracted from the Pancreas of animals was first succeeded by

- (A) Banting and Best
- (B) Batson and Punnet
- (C) Patrick and Paterson
- (D) Benton and Bennett
- (E) Answer not known

185. One of the most productive sources of Antibiotics

- (A) Penicillium
- (B) Streptomyces
- (C) Aspergillus
- (D) Bacillus
- (E) Answer not known

186. Homopolymer extensions can be synthesized by using terminal

- (A) Polynucleotidyl transferase
- (B) Deoxynucleotidyl transferase
- (C) Ribonucleotidyl transferase
- (D) Mononucleotidyl transferase
- (E) Answer not known

187. Interferons confer protection to the living organisms from
- (A) Fungal infection
  - (B) Bacterial infection
  - (C) Viral infection
  - (D) Insect infection
  - (E) Answer not known
188. The Contagious disease Diptheria is transmitted by \_\_\_\_\_ way.
- (A) Water borne
  - (B) Air borne
  - (C) Soil borne
  - (D) Food borne
  - (E) Answer not known
189. The process of extracting metals from ore bearing rocks is called
- (A) Biofiltration
  - (B) Bioleaching
  - (C) Bioextraction
  - (D) Microbial extraction
  - (E) Answer not known
190. Which among the following microorganism is used in the Industrial production of insulin?
- (A) Acetobacter suboxidans
  - (B) Escherichia coli
  - (C) Streptomyces griseus
  - (D) Xanthomonas campestris
  - (E) Answer not known

191. \_\_\_\_\_ is the organic materials derived from plants and animals that has been decomposed through aerobic decomposition.

- (A) Compost
- (B) Panchakaviya
- (C) Biofertilizer
- (D) Vermiculture
- (E) Answer not known

192. In the process of biogas production, the correct sequence of events are

- (A) Acidifying → Hydrolytic → Acetogenic → Methanogenic
- (B) Acidifying → Acetogenic → Hydrolytic → Methanogenic
- (C) Hydrolytic → Acetogenic → Acidifying → Methanogenic
- (D) Hydrolytic → Acidifying → Acetogenic → Methanogenic
- (E) Answer not known

193. Among the following which one is associated with DDT degradation?

- (A) Aspergillus flavus
- (B) Aspergillus niger
- (C) Penicillium chrysogenum
- (D) Fusarium moniliforme
- (E) Answer not known

194. A non sense mutation involves

- (A) A regulatory sequence
- (B) An AG splice acceptor site
- (C) The creation of a different amino acid
- (D) The creation of a stop codon
- (E) Answer not known

195. The two strands that are complimentary and antiparallel to each other is called \_\_\_\_\_ base pairing.

- (A) Watson and Crick
- (B) Hershey and Chase
- (C) Jacob and Monod
- (D) Jacques and Monad
- (E) Answer not known

196. Match the following :

Technique	Approach
(a) Intrinsic bioremediation	1. Artificial induction of population of microbes
(b) Biostimulation	2. Use of pollution tolerant plants
(c) Bioaugmentation	3. Applying naturally occurring Microbial population
(d) Phytoremediation	4. Enabling the viable natural population of microbes to remove the pollution

- |                                         | (a)              | (b) | (c) | (d) |
|-----------------------------------------|------------------|-----|-----|-----|
| (A)                                     | 2                | 1   | 4   | 3   |
| <input checked="" type="checkbox"/> (B) | 3                | 4   | 1   | 2   |
| (C)                                     | 1                | 2   | 3   | 4   |
| (D)                                     | 4                | 3   | 2   | 1   |
| (E)                                     | Answer not known |     |     |     |

197. The left-handed helical DNA found in solutions of high-ionic strength is \_\_\_\_\_ DNA.

- (A) A
- (B) B
- (C) C
- (D) Z
- (E) Answer not known

198. Acridines usually cause

- (A) Tautomerization
- (B) Frame shift mutation
- (C) Missense mutation
- (D) Depurination
- (E) Answer not known

199. Which of the following hormones bind to the cell surface receptors and mediates action of C'AMP

- (i) ACTH and FSH
  - (ii) Calcitriol and progestins
  - (iii) ADH and Calcitonin
  - (iv) Glucagon and Norepinephrine
- (A) (i) and (ii)
  - (B) (i), (iii) and (iv)
  - (C) (ii), (iii) and (iv)
  - (D) (ii) alone
  - (E) Answer not known



200. Pollen kit substances predominantly consists of

- (A) Chlorophyll
  - (B) Phycoerythrin
  - (C) Astaxanthin
  - (D) Carotenoid
  - (E) Answer not known
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