

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

Ph.D. (TAXONOMY)

COURSE CODE : 132

Register Number :

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*Signature of the Invigilator*  
(with date)

COURSE CODE : 132

Time : 2 Hours

Max : 400 Marks

*Instructions to Candidates :*

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you -1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Which of the following species is restricted to a given area?
 

(A) Allopatric species	(B) Sympatric species
(C) Sibling species	(D) Endemic species
  
2. Species which are able to exchange genes freely without loss of fertility or vigour is known as
 

(A) Superspecies	(B) Coenospecies
(C) Ecospecies	(D) Semispecies
  
3. Binomial nomenclature was introduced by
 

(A) John ray	(B) Carlous Linnaeus
(C) De candolle	(D) Darwin
  
4. Binomial nomenclature means
 

(A) Every organism is having one scientific name with a combination of genus and species
(B) Organism contains generic name
(C) Organism contains specific name
(D) None of these
  
5. Carlous Linnaeus system is an artificial system because
 

(A) It is based on evolutionary trends
(B) It is based on number of characters
(C) It is based on a few characters of superficial similarities and dissimilarities on morphology
(D) It is phylogenetic
  
6. Which of the taxa is not recognized by a botanist?
 

(A) Family	(B) Species
(C) Subspecies	(D) Order
  
7. The outlook of the classical systematic is embodied in
 

(A) Species concept	(B) Biological concept
(C) Typological concept	(D) None of these
  
8. The term 'Systematics' was coined by
 

(A) Ernst Haecker	(B) De Candolle
(C) Copeland	(D) Carlous Linnaeus

9. The correct sequence of taxa is
  - (A) Class-Order- Family- Tribe -Genus-Species
  - (B) Class-Order- Tribe -Family-Genus-Species
  - (C) Phylum-Order-Class-Tribe-Genus-Species
  - (D) Phylum-Tribe-Class-Order-Genus-Species
10. A taxonomic system based only on the traits that reflect the order in time in which branches arose in a phylogenetic tree is called
  - (A) Phylogeny
  - (B) Cladistics
  - (C) Classical evolutionary taxonomy
  - (D) Phenetics
11. Phylogeny describes a species
  - (A) Morphological similarities with other species
  - (B) Evolutionary history
  - (C) Geographic distribution
  - (D) Reproductive compatibilities with other species
12. A taxonomic system based on all phenotypic similarities equally weighted and without regard to evolutionary relationship is called
  - (A) Phylogeny
  - (B) Cladistics
  - (C) Classical evolutionary taxonomy
  - (D) Phenetics
13. A taxonomic system that uses phenotypic similarities as well as judgment of homologies along a branching sequence is called
  - (A) Phylogeny
  - (B) Cladistics
  - (C) Classical evolutionary taxonomy
  - (D) Phenetics
14. The important aspects of the study of taxonomy are
  - (A) Nomenclature
  - (B) Classification
  - (C) Identification
  - (D) All of the above
15. The binomial system of nomenclature was initially devised by
  - (A) Linnaeus
  - (B) Casper Bauhin
  - (C) De candolle
  - (D) Caesalpino
16. The first international Botanical Congress met in
  - (A) Paris
  - (B) Vienna
  - (C) Cambridge
  - (D) Geneva

17. The first laws of botanical nomenclature was framed by  
(A) Augustine P. de Candolle (B) Alphonse de Candolle  
(C) Casimir de candolle (D) Linnaeus
18. The repetition of the generic name as a specific epithet is called  
(A) Homonymy (B) Synonymy  
(C) Tautonymy (D) None of the above
19. Binomials become trinomials when  
(A) The name of the species is changed  
(B) The name of the genus is changed  
(C) When the subspecific category is also indicated  
(D) None of the above
20. The particular specimen or element designated by the author of a taxon is designated as  
(A) Paratype (B) Holotype  
(C) Lectotype (D) Neotype
21. The first phylogenetic system of plant classification to be ever put fourth was that of  
(A) Bentham and Hooker (B) Engler and Prantl  
(C) Hutchinson (D) Eichler
22. The first person to propose the concept of species was  
(A) Charles Darwin (B) Linnaeus  
(C) Tournefort (D) John Ray
23. A specimen or element selected by a competent worker as a substitute for an undesignated, missing or destroyed holotype is called  
(A) Neotype (B) Paratype  
(C) Cotype (D) Leucotype
24. One of the two or more specimens or elements designated simultaneously as the type is called  
(A) Isotype (B) Syntype  
(C) Neotype (D) Paratype

25. A second specimen from the same plant from which the holotype was collected is called
- (A) Isotype
  - (B) Paratype
  - (C) Neotype
  - (D) Cotype
26. A topotype is
- (A) A specimen selected to serve as a substitute for the holotype
  - (B) A specimen other than the holotype referred to in the original publication
  - (C) A specimen used by a second author
  - (D) A specimen collected at the type locality
27. Duplication of names is avoided by the application of
- (A) Type concept
  - (B) The principal of priority
  - (C) Synonyms
  - (D) Homonyms
28. Interspecific hybrids are designated
- (A) By connecting names of both the parents by a multiplication sign
  - (B) By giving a new epithet for the hybrid and connecting the generic name and the new epithet by a multiplication sign
  - (C) (A) and (B)
  - (D) None of the above
29. The names of the intergeneric hybrids are framed
- (A) By adding a multiplication sign between the two parent genera
  - (B) By a combination of both generic names and placing the multiplication sign before such a combined name
  - (C) (A) and (B) both
  - (D) None of the above
30. Reproductive characters are more valuable than vegetative characters in classification because they are
- (A) Relatively more constant
  - (B) Less influenced by the environment
  - (C) More numerous
  - (D) All of the above
31. Descriptive systematic botany was called by Turrill as
- (A) Biosystematics
  - (B) Omega taxanomy
  - (C) Beta taxanomy
  - (D) Alpha taxanomy

32. Palynological characters which are widely useful in taxonomy are  
 (A) Apertural morphoforms (B) Exine ornamentation  
 (C) Pollen nuclear number (D) All three of the above
33. Cytotaxonomy utilizes the following different criteria  
 (A) Chromosome number (B) Chromosome morphology  
 (C) Cytochemistry (D) All the above
34. Taxonomy based on identification of evolutionary units within species by determining their genetical interrelationship is called  
 (A) Numerical taxonomy (B) Biochemical taxonomy  
 (C) Experimental taxonomy (D) Chemotaxonomy
35. Who has introduced five kingdom system of biological classification?  
 (A) Linnaeus (B) Copeland  
 (C) Ernst Mayr (D) Robert h. Whittaker
36. Who has suggested six-kingdom classification?  
 (A) Whittaker (B) Carl Woese  
 (C) Huxley (D) Haeckel
37. Six-Kingdom classification is based on the sequence of:  
 (A) Nitrogenous bases in DNA (B) Ribosomal RNA genes  
 (C) Messenger RNA genes (D) Transfer RNA genes
38. Authors of the book Principles of Numerical Taxonomy are  
 (A) Alston and Turner (B) Sokal and Sneath  
 (C) Hansen and Rahn (D) Engler and Prantl
39. The serum diagnosis method in plant taxonomy was pioneered by  
 (A) Alston and Turner (B) Hegenaeuer  
 (C) K.C.Mez (D) Heywood
40. Which of the following statements regarding alpha diversity is/are correct?  
 (A) Alpha diversity is represented by the number of species in a specified area.  
 (B) It increases with the total number of individuals encompassed and thus with the increase in the area samled and the productivity per unit area  
 (C) It is less on remote islands and increases as one moves towards the equator.  
 (D) All of the above

41. Which of the following statements regarding biodiversity is/are correct?
- (A) Beta diversity is represented by the turnover of the species across space
  - (B) Beta diversity refers to the degree to which species composition change along an environmental gradient
  - (C) Gamma diversity is a species turnover rate with distance between sites of similar habitat or with expanding geographical area
  - (D) All of the above
42. At present, the most significant cause of dwindling biodiversity is probably
- (A) biological magnification of DDT
  - (B) global warming
  - (C) the deterioration of ozone layer
  - (D) the destruction of habitat
43. Which of the following habitats show the highest diversity of living species?
- (A) Grassland
  - (B) Temperate forest
  - (C) Desert
  - (D) Tropical rainforest
44. The Red Data Book which lists endangered species is maintained by
- (A) WWF
  - (B) UNO
  - (C) WHO
  - (D) IUCN
45. Most dangerous threat to wildlife is by
- (A) hunting
  - (B) overgrazing
  - (C) habitat destruction
  - (D) introduction of exotic species
46. Conservation is
- (A) Proper use of natural resources
  - (B) Protection of natural resources
  - (C) Management of natural resources
  - (D) All of the above
47. Many wild plants and animals are on the verge of extinction due to
- (A) climatic changes
  - (B) deforestation
  - (C) non-availability of food
  - (D) none of the above
48. The central legislative measures called 'Wildlife Protection Act' was passed in
- (A) 1951
  - (B) 1972
  - (C) 1977
  - (D) 1980
49. When was 'Man and the Biosphere' programme launched by the UNESCO
- (A) 1965
  - (B) 1968
  - (C) 1971
  - (D) 1986

50. Anastral mitosis is characteristic of  
(A) Higher plants (B) Higher animals  
(C) All living organisms (D) Lower animals
51. Phragmoplast is  
(A) Plastid capable of fragmentation  
(B) Plastid capable of duplication  
(C) Cell plate formed of ER and dictyosomes (Secretory vesicles) during cytokinesis  
(D) Cell plate formed by ER, dictyosome (secretory vesicles) and portion of spindle fibre
52. Hodgkin's disease is an example of  
(A) Osteoma (B) Human lymphoma  
(C) Carcinoma (D) Leukaemia
53. Vaccination against small pox means introduction in our body of  
(A) WBCs obtained from animals  
(B) Antibodies produced in other animals  
(C) Actual weakened germs  
(D) None of these
54. For the chemical change  $A \rightarrow B$ , it is found that the rate of reaction doubles when the concentration is increased four times. The order of the reaction is  
(A) Half (B) One  
(C) Two (D) Zero
55. The degeneracy of genetic code means that  
(A) The same amino acid can be coded by two or more codes  
(B) All the living organisms on the earth have the same codes  
(C) Genetic code varies with different organisms  
(D) The same code may code more than one amino acid
56. What is the function of centrosome?  
(A) Formation of spindle fibre  
(B) Duplication of DNA  
(C) Division of centromere  
(D) Longitudinal splitting of chromosomes



57. The whole enzyme molecule called holoenzyme is made up of proteinaceous part and a cofactor. Proteinaceous part is
- (A) Coenzyme (B) Apoenzyme  
(C) Proenzyme (D) Prosthetic group
58. One of the following ratio is constant in DNA's of different species.
- (A)  $A + T / C + G$  (B)  $A + G / T + C$   
(C)  $A + C / T + G$  (D)  $A + U / C + G$
59. The element required for the activation of DNA and RNA is
- (A)  $Ca^{2+}$  (B)  $Mg^{2+}$   
(C)  $K^{+}$  (D)  $Cu^{2+}$
60. Emerson enhancement proves that
- (A) There are two photochemical reactions in light reaction  
(B) There are light and dark reactions in photosynthesis  
(C) Photophosphorylation  
(D) Photorespiration
61. Species most vulnerable to extinction from human activities are those with
- (A) Low carrying capacities (B) High population growth rates  
(C) Large niches (D) Many natural predators
62. Species is
- (A) Specific class of evolution (B) Specific unit of evolution  
(C) Specific unit of the evolutionary (D) History of a race
63. A species is taxonomically
- (A) A fundamental unit in the phylogenetic history of organisms  
(B) A group of evolutionary related population  
(C) A base category to which most taxonomic information is attached  
(D) A population with common characteristics as evolutionary base of variation
64. The species inhabiting different geographical areas are
- (A) Sympatric (B) Allopatric  
(C) Sibling species (D) Morphospecies

65. Two or more species occupying identical or overlapping areas are known as  
(A) Sympatric (B) Subspecies  
(C) Allopatric (D) Sibling species
66. Related species which are reproductively isolated but morphologically similar are called  
(A) Sympatric (B) Allopatric  
(C) Sibling species (D) Morphospecies
67. Of all the taxa, the only one that exists in nature as a biologically cohesive unit is the  
(A) Species (B) Genus  
(C) Kingdom (D) Phylum
68. Static concept of species was put forward by  
(A) Darwin (B) Theophrastus  
(C) De candolle (D) Linnaeus
69. Mayr's biological concept of species is mainly based on  
(A) Morphology (B) Reproductive isolation  
(C) Modes of reproduction (D) Morphology and reproduction
70. Linnaeus system of classification was based on  
(A) Cytology (B) Morphology  
(C) Ecology (D) Embryology
71. Natural classification is based on  
(A) Ontogeny (B) Morphology  
(C) Phylogeny (D) Both morphology and phylogeny
72. Natural system of classification differs from artificial system is  
(A) Developing evolutionary trends  
(B) Employing only one floral trait  
(C) Taking only one vegetative trait  
(D) Bringing out similarities and dissimilarities
73. Classification given by Bentham and Hooker is  
(A) Numerical (B) Artificial  
(C) Natural (D) Phylogenetic

74. Phylogenetic system brings about
- (A) Grouping according to evolutionary trends
  - (B) Grouping on the basis of increasing complexities
  - (C) Grouping according to morphological characters
  - (D) Reproductive similarities
75. Who is the author of 'Species Plantarum'?
- (A) Charles Darwin
  - (B) John Ray
  - (C) Carlous Linnaeus
  - (D) Julian Huxley
76. Who proposed phylogenetic classification of plants?
- (A) Hutchinson
  - (B) Linnaeus
  - (C) De candolle
  - (D) Bentham and Hooker
77. The concept of genus was proposed by
- (A) John Ray
  - (B) Hooker
  - (C) Tournefort
  - (D) Bessey
78. The term "Taxonomy" was first proposed by the French Botanist:
- (A) De candolle
  - (B) Linnaeus
  - (C) Lamarck
  - (D) Nageli
79. A food web
- (A) Increases variety of food at each trophic level
  - (B) Delicately balances the interrelations amongst organisms
  - (C) Decreases variety of food but increases quantity of food at each trophic level
  - (D) Increases variety as well as quantity of food at each trophic level
80. Measurement of the rate of  $O_2$  consumption in unit volume of water over a period of time is done to find out
- (A) Biogas generation
  - (B) Biological oxygen demand
  - (C) Biosynthetic path ways
  - (D) Fermentation
81. Agroecosystem is unstable because of
- (A) Lack of variety
  - (B) Lack of biological control
  - (C) Both (A) and (B)
  - (D) Being man-made

82. Taxonomy without the phylogeny is like bones without flesh is a statement of  
(A) John Hutchinson (B) Bentham and Hooker  
(C) Takhtajan (D) Oswald Tippo
83. Which of the following compound is efflorescent?  
(A) Soda ash (B) Baking soda  
(C) Soda-Lime (D) Washing soda
84. Oxygen can have positive oxidation state only in  
(A) Fluorides (B) Chlorides  
(C) Iodine (D) All
85. In Eutheria, if the fertilized ovum is implanted in the uterine wall, then further development of the foetus cannot occur  
(A) Without the formation of placenta (B) In the presence of progesterone  
(C) In the presence of foetal membranes (D) With mother's hormones
86. The oral contraceptive pill used by women  
(A) permits ovulation, but prevents fertilization  
(B) permits ovulation, but blocks luteinization  
(C) permits fertilization but interferes with implantation  
(D) inhibits ovulation by suppressing pituitary LH secretion
87. The fertilized egg in human female gets implanted in the uterus after  
(A) two months of fertilization (B) about one week days of fertilization  
(C) one month of fertilization (D) three weeks of fertilization
88. "Red gland" in the anterior chamber of swim bladder in physoclistous fishes serves as:  
(A) the site where hemoglobin is produce  
(B) the place where from oxygen is produced  
(C) an organ where oxygen is absorbed  
(D) a hydrostatic organ

89. Choroid, besides pigments, includes tapetum lucidum which may act as
- Dark adaptation device
  - Light reflecting device and is found in
  - Nocturnal terrestrial animals, elasmobranchs and fishes living in deep water
  - Limbless amphibians and all fishes
- The correct combination of functions of tapetum lucidum and the groups in which it is found is
- (i) and (iii)
  - (ii) and (iii)
  - (ii) and (iv)
  - (i) and (iv)
90. Can the wing of Draco be homologized with that of bat?
- Yes, because both have membranes of skin
  - No, because membranes in Draco are supported by greatly lengthened six pairs of ribs and in bat by the anus, greatly elongated 2nd through 5th fingers, hind limbs and usually all or part of the tail
  - Yes, because wings of both of them can be folded and expanded according to the need
  - No, because the wing of Draco is used for gliding while that of bat is used for flying
91. Electric organs of fishes are highly modified masses of
- nerve cells
  - muscle cells
  - elastic fibres
  - white fibres
92. The body movements of fishes are brought about by alternate expansion and contraction of myotomes. The paired fins, dorsal fin and anal fin are associated with locomotion or movement of fishes. Which one of the following sets correctly indicates the part played by the fins during rapid swimming of fishes?

Paired fins :

- For balancing so that the fish remains in position.
- For balancing
- Act as keel to give stability to the body
- For balancing and giving stability to the body

Dorsal and anal fins :

Form keel which can be lowered or raised as per needs to give stability to the body

For balancing and to give stability to the body For balancing

To rise or lower the body as per needs

93. The largest and the most powerful adductor muscles in flying bird is the  
 (A) coracobrachialis longus (B) pectoralis major  
 (C) pectoralis minor (D) tensor longus
94. Genetic recombination takes place during  
 (A) prophase of meiotic division-I (B) metaphase of meiotic division-II  
 (C) prophase of meiotic division-II (D) metaphase of meiotic division-I
95. Which one of the following is tightly bound to the cell membrane?  
 (A) c-AMP (B) Adenylate cyclase  
 (C) Ribonuclease (D) ATP
96. Which of the following pair(s) of animals and organs is/are correctly matched?  
 (i) Balanoglossus – Oral hood  
 (ii) Ascidian – Tube feet  
 (iii) Amphioxus – Velum  
 Select the correct answer using the codes given below :  
 Codes :  
 (A) (i), (ii) and (iii) (B) (i) and (iii) (C) (ii) alone (D) (iii) alone
97. In singing birds, the sound is produced by the  
 (A) lungs (B) air-sacs (C) syrinx (D) larynx
98. A flying bird lands by  
 (A) folding the wings back and dropping on the grounds or other substratum  
 (B) folding the wings above and back of the body and coming down  
 (C) lowering and fanning out the rectrices  
 (D) pronation and forward movements of wings
99. Ecdysone is produced by which of the following?  
 (A) Neuro secretory cells (B) Protocerebrum  
 (C) Prothoracic gland (D) Corpora allata
100. Which one of the following is a characteristic of adult ascidian?  
 (A) Elongated tail (B) Large notochord  
 (C) Enlarged pharynx (D) Well developed statocyst