

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2013.

Ph.D.(TAXONOMY)

COURSE CODE : 132

Register Number :

*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 of the 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. The structure of molluscs that forms the shell and houses the gills is the
 - (A) mantle
 - (B) epidermis
 - (C) gastrovascular cavity
 - (D) odontophore

2. The structure that is used for feeding in most molluscs is the
 - (A) buccal cavity
 - (B) radula
 - (C) mouth
 - (D) Odontophore

3. The portion of the radula that supports the teeth and is cartilaginous is called the
 - (A) Spicules
 - (B) visceral mass
 - (C) teeth
 - (D) odontophore

4. A molluscan shell is made of three layers arranged from the outside to the inside:
 - (A) Mantle layer, prismatic layer, periostracum.
 - (B) prismatic layer, periostracum, nacreous layer
 - (C) periostracum, prismatic layer, nacreous layer
 - (D) nacreous layer, periostracum, mantle layer

5. The first larval stage that is typical of molluscans is the
 - (A) Planula
 - (B) Veliger
 - (C) Actinotroph
 - (D) Trochophore

6. The trochophore larva indicates a common ancestry for which of the following pairs?
 - (A) Mollusca-Annelida
 - (B) Mollusca-Cnidaria
 - (C) Mollusca-Cephalopoda
 - (D) Mollusca-Nematoda

7. The characters of no shell, integumental scales, a reduced head and being dioecious describes which of the following molluscs?
 - (A) Caudofoveata
 - (B) Solenogastres
 - (C) Monoplacophora
 - (D) Polyplacophora

8. Which of the following classes of molluscs is thought to be the most primitive or closest to the ancestral form?
 - (A) Caudofoveata
 - (B) Solenogastres
 - (C) Monoplacophora
 - (D) Polyplacophora

9. Gastropoda taxonomy is currently under consideration. The traditional three subclasses are Prosobranchia, and two others;
- (A) Nudbranchia, Pelycopoda (B) Pelycopoda, Opisthobranchia
 (C) Opisthobranchia, Pulmonata (D) Pulmonata, Nudibranchia
10. Which of the following structures do bivalves use in the process of digestion?
- (A) a crystalline style (B) a jaw
 (C) peristaltic muscles (D) byssal threads
11. The cuticle of arthropods is composed of a thicker inner _____ layer, and a thinner outer layer. the _____. The macromolecule that characterizes the cuticle is.
- (A) exocuticle, endocuticle, chitin (B) procuticle, epicuticle, chitin
 (C) endocuticle, procuticie, keratin (D) epicuticle, exocuticle, keratin
12. The nonliving exoskeleton inhibits growth. To cope with this situation, arthropods use a process to shed the old exoskeleton called
- (A) Ecdysis (B) Metamorphosis
 (C) Tagmatazation (D) Shedding
13. The _____ have been extinct for 250 million years but they show the basic pattern that started the arthropods.
- (A) Crustaceans (B) Pycnogonids
 (C) Trilobites (D) Xiphosurids
14. The characteristics of four pairs of walking legs, a pair of pedipalps, and no mandible or antennae are found in which of the following?
- (A) Chelicerata (B) Eurypterida (C) Xiphosurida (D) Pycnogonida
15. Which of the following can be recognized by these characteristics: unsegmented carapace, spinelike telson, book gills, and marine habitat?
- (A) Chelicerata (B) Eurypterida (C) Xiphosurida (D) Pycnogonida
16. Members of the class Arachnida can be differentiated from other arthropods by possession of a
- (A) cephalothorax and trunk (B) head, thorax, and abdomen
 (C) head and thorax (D) cephalothorax and abdomen

17. Which of the following orders contains members who have a cephalothorax and abdomen with no external segmentation, and these tagmata are joined by a narrow pedicel?
 (A) Araneae (B) Scorpionida (C) Opiliones (D) Acari
18. Which of the following traits are unique to spiders?
 (A) malpighian tubules (B) book lungs
 (C) simple eyes (D) silk glands
19. Which of the following orders is characterized by having an abdomen divided into a preabdomen and a tail-like postabdomen?
 (A) Araneae (B) Scorpionida (C) Opiliones (D) Acari
20. The mouthparts of ticks are located on an anterior projection called the
 (A) Prostomium (B) Peristomium (C) Capitulum (D) Rostrum
21. Ticks are interesting to epidemiologists because they are second only to mosquitoes as _____ for serious diseases.
 (A) sources of antibiotics (B) agents
 (C) sources of antivenoms (D) vectors
22. The crustaceans are the only arthropods with
 (A) head, thorax, and abdomen (B) two pairs of antennae
 (C) mandibles (D) biramous appendages
23. Which of the following classes contains the crabs, shrimp, and krill?
 (A) Branchiopoda (B) Maxillopoda
 (C) Malacostraca (D) Chilopoda
24. The crustaceans known as krill belong to the group
 (A) Branchiura (B) Notostraca
 (C) Euphausiacea (D) Cirripedia
25. While most of the platyhelminths are free living or endoparasites, which one of the following taxa has an ectoparasitic life cycle?
 (A) Turbellaria (B) Trematoda
 (C) Monogenea (D) Cestoda

26. Cells that secrete mucus in the epidermis of the Turbellaria are called
- (A) Parenchyma (B) Rhabdites
(C) Cuticle cells (D) Teguments
27. While the previous phyla have used intracellular digestion, within these three phyla extracellular digestion is the norm. Extracellular digestion means that
- (A) proteolytic enzymes are secreted into the gut
(B) proteolytic enzymes are found in the lysosomes
(C) only parasitic feeding styles are used
(D) there is only one opening to the intestine
28. Protonephridia function in
- (A) waste disposal (B) respiration
(C) osmoregulation (D) digestion
29. Light-sensitive sense organs in the flatworms are called
- (A) Rheoreceptors (B) Ocelli
(C) Auricles (D) Statocysts
30. The chain of proglottids is collectively called the _____ and the holdfast or attachment organ is called the _____
- (A) strobila, scolex (B) scolex, opisthaptor
(C) opisthaptor, cercaria (D) cercaria, strobila
31. Cladistic analysis indicates that the class _____ is paraphyletic and will therefore probably be further divided into many more taxa.
- (A) Trematoda (B) Cestoda
(C) Monogenea (D) Turbellaria
32. Sponge bodies do not have organs, instead they have masses of cells supported by
- (A) ostia or oscula (B) spicules or sponging
(C) oscula or spicules (D) spongin or ostia
33. Porifera have an extensive fossil record that extends back to the _____ era.
- (A) Jurassic (B) Mesozoic (C) Paleozoic (D) Cambrian

34. The pores in the surface of a sponge that pass incoming water to the body are called _____ and the opening by which water passes out of the sponge is called the _____.
- (A) choanocytes, radial canal (B) spongins, spongocoel
(C) pinacocytes, excurrent canal (D) ostia, osculum
35. The flagellated cells that line the canals of the sponge are called
- (A) Choanocytes (B) Porocytes (C) Pinacocytes (D) Ostia
36. African sleeping sickness and Chagas's disease are both caused by protozoa in the genus
- (A) *Noctiluca* (B) *Plasmodium* (C) *Toxoplasma* (D) *Trypanosoma*
37. A resistant, quiescent stage in the life cycle of a protozoan is called a
- (A) Sporozoite (B) Gamete (C) Cyst (D) Merozoite
38. When cilia are fused into a sheet of material that can be used for locomotion or for moving food particles toward the cytopharynx, the sheet is called a(n)
- (A) Infraciliature (B) Undulating membrane
(C) Flagella (D) Pellicle
39. When a person becomes infected with the protist *Plasmodium*, sporozoites enter the liver cells and undergo a process known as _____producing merozoites which then enter red blood cells.
- (A) Exogeny (B) Schizogony (C) Gametogeny (D) Sporogony
40. Some of the oldest known fossils of eukaryotic organisms that have been identified are members of the group called
- (A) Diffugiants (B) Radiolarians
(C) Arcellians (D) Dinoflagellates
41. The protozoans are characterized by the _____grade of organization.
- (A) protoplasmic (B) cell-tissue
(C) tissue-organ (D) organ-system
42. The first person to classify animals in a way that is still used today was
- (A) Linnaeus (B) Haeckel (C) Aristotle (D) Hennig

43. Which of the following terms best describes a cladogram?
- (A) branching tree (B) nested hierarchy
(C) phylogenetic tree (D) polyphyly
44. In the Linnaean system of naming, a single species is identified by a binomial, which consists of the following two parts:
- (A) phylum and class (B) class and order
(C) family and genus (D) genus and species epithet
45. The source of information about relationships that comes from the study of anatomy is called
- (A) comparative biochemistry (B) comparative cytology
(C) analytical anatomy (D) comparative morphology
46. The current status of taxonomy is in transition. It is changing from a focus on _____ toward a focus on.
- (A) evolutionary taxa, cladistic taxa (B) cladistic taxa, phylogenetic taxa
(C) phylogenetic taxa, numerical taxa (D) numerical taxa, evolutionary taxa
47. While there are many criteria to describe the difference between two species, the biological definition of a species is based on being part of
- (A) a population of animals that are in one place
(B) a population of animals that behave alike
(C) an interbreeding population of animals
(D) a population of animals that look alike
48. The biological definition of a species is only one of two currently used definitions for the term species; the other definition is the
- (A) phylogenetic species concept (B) typological species concept
(C) cladistic species concept (D) Linnaean species concept
49. Birds have wings, as do beetles. However, they do not share a recent, common ancestor. Therefore the possession of wings is known as
- (A) Homology (B) Homoplasy
(C) Polarity (D) Ancestry

50. Comparative biochemistry compares the sequences of amino acids in proteins as well as _____ to identify characters used to construct cladograms.
- (A) triglyceride sequences (B) nucleotide sequences
(C) carbohydrate chains (D) ribosomes
51. Phylogenetic systematics was first proposed by
- (A) Linnaeus (B) Aristotle (C) Hennig (D) Ray
52. Two different monophyletic groups that share common ancestry with each other more recently than either does with other taxa are known as
- (A) Symplesiomorphies (B) Synapomorphies
(C) Subspecies (D) Sister groups
53. The species concept includes all of these ideas, with the exception of
- (A) reproductive community (B) smallest distinct groupings
(C) common descent (D) sister groups
54. A new taxonomic code, PhyloCode, has been proposed as an alternate to Linnean taxonomy. PhyloCode is based on
- (A) numerical taxonomy (B) evolutionary systematic
(C) cladistic principles (D) acquired characters
55. To reconstruct a phylogeny, one must first determine the _____, the form of a trait that was found in the most recent common ancestor.
- (A) outgroup (B) ancestral character state
(C) derived character state (D) synapomorphy
56. The scientific method is sometimes described as a "hypothetico-deductive method" that begins by formulating a(n) _____ based upon prior observations of nature.
- (A) Conclusion (B) Hypothesis
(C) Experiment (D) Answer
57. If a hypothesis is very powerful in explaining many related phenomena and is widely supported, it becomes known as a
- (A) Deduction (B) Theory
(C) Conclusion (D) Suitable answer

58. The scientific method is based on a
- (A) Hypothesis (B) Fact (C) Law (D) Theory
59. Another name for an immediate cause of a biological function is a(n)
- (A) initial cause (B) first cause
(C) basic cause (D) proximate cause
60. The biological sciences that address proximate causes are the
- (A) experimental sciences (B) anatomical sciences
(C) microbiological sciences (D) cellular sciences
61. In the experimental method, a control is used to protect against unperceived factors. A control is repetition
- (A) with monitoring (B) with additional factors
(C) without application of a treatment (D) by someone else
62. The evolutionary sciences investigate _____ causes (i.e. those that have generated biological systems).
- (A) ancient (B) non-human (C) relationship (D) ultimate
63. The concept of evolutionary change was first proposed by
- (A) Lamarck (B) Wallace
(C) Lyell (D) Early Greek philosophers
64. Instead of using the experimental method, evolutionary sciences use a
- (A) comparative method (B) fossilized method
(C) mentally insightful method (D) non-controlled method
65. The most widely accepted parts of Darwin's theory include
- (A) gradualism
(B) perpetual change
(C) natural selection
(D) inheritance of acquired characteristics

66. Another term for the structure of the branching tree that depicts evolutionary relationships is
 (A) Homology (B) Analogy (C) Phylogeny (D) Autonomy
67. One of the more controversial theories of Darwinism is
 (A) common descent
 (B) perpetual change
 (C) gradualism
 (D) inheritance of acquired characteristics
68. Which of the following is not true concerning perpetual change?
 (A) Characteristics of organisms are modified over time
 (B) Perpetual change is not supported by the fossil record
 (C) Perpetual change is the basis for the theory of evolution
 (D) All of the above do not pertain to perpetual change
69. Which of the following is NOT one of the 5 major theories of Darwinism?
 (A) perpetual change (B) acquired characteristics
 (C) natural selection (D) None
70. Charles Lyell recognized that the earth is always changing and that the laws of the physical sciences do not change; he formulated these thoughts into the principle of
 (A) acquired inheritance (B) geologic catastrophism
 (C) natural selection (D) uniformitarianism
71. Charles Darwin collected and synthesized data for over 20 years to produce his extensively documented book,
 (A) The Origin of Man (B) On the Origin of Species
 (C) Evolution of Man and Monkey (D) Survival of the Fittest
72. The idea that the environment affects the survival rate of animals is termed
 (A) natural selection (B) extinction
 (C) evolution (D) propagation

73. The part of the evolutionary theory that is termed "multiplication of species" is defined as
- (A) new species created in new environments
 - (B) new species gradually appearing in the fossil record
 - (C) new species formed from older ones
 - (D) all species increasing geometrically
74. The inference that some members of a species will live longer and have more offspring than other members of the same population is called
- (A) predation
 - (B) differential reproduction
 - (C) random chance
 - (D) competition
75. Evidence of perpetual change is most directly seen in
- (A) the diversity of organisms present today
 - (B) the fossil record
 - (C) present day species loss
 - (D) ontogeny
76. Trends in fossil diversity through time are the result of different rates of species formation versus _____ through time.
- (A) Extinction
 - (B) Mutation
 - (C) Radiation
 - (D) Decomposition
77. The element potassium-40, which has a half life of approximately _____ is used for dating fossils.
- (A) 5 million years
 - (B) 1.3 billion years
 - (C) 50,000 years
 - (D) 1 million years
78. The fossil record of macroscopic organisms begins early in the Cambrian period of the Paleozoic era, which was years ago?
- (A) 70 thousand
 - (B) 100 thousand
 - (C) 600 million
 - (D) 3 billion

79. The proposal by Darwin that all living things have descended from a single original source may have seemed far-fetched at that time, but it is supported by more recent studies of similar anatomical structures. This is called
- (A) Analogy (B) Pathology (C) Embryology (D) Homology
80. An example of a homologous structure that has been studied to determine degrees of relationship is the vertebrate
- (A) Patella (B) Tail (C) Limb (D) Eye
81. Evolutionary change in the timing of development is called _____, and can result, for example, in one organism developing a heart with three chambers while another develops four chambers from similar tissue
- (A) incomplete dominance (B) hybridization
(C) heterochrony (D) birth defects
82. While there is not complete consensus regarding the definition of the term species, most biologists would include all of the following except
- (A) reproductive compatibility
(B) maintenance of genotypic cohesion
(C) a generally consistent appearance of all members
(D) descent from a common ancestral population
83. The biological factors that prevent different species from interbreeding are called reproductive barriers and the most common form is
- (A) Geographical (B) Behavioral
(C) Chromosomal (D) Temporal
84. When speciation occurs as a result of reproductive barriers between geographically separated populations, it is known as
- (A) genetic speciation (B) allopatric speciation
(C) reproduction isolation (D) sympatric speciation
85. The term _____ describes the condition when diverse species from a common ancestral stock are found in different habitats.
- (A) linear evolution (B) punctuated evolution
(C) adaptive radiation (D) radiating gradualism

86. The discontinuous nature of the fossil record regarding evolutionary changes may be best explained by
- (A) Creationism (B) Inadequate fossil excavations
(C) The slow rate of geologic time (D) Punctuated equilibrium
87. The study of evolution occurring within a single population or several groups of populations with related gene frequencies is called
- (A) Minievolution (B) Microevolution
(C) Polyevolution (D) Macroevolution
88. The occurrence of different allelic forms of a gene in a population is called
- (A) Polymorphism (B) Heterozygous
(C) Recessive phenotypes (D) Trisomy
89. The two individuals who established the mathematical formula for calculating allelic frequency were
- (A) Darwin and Wallace (B) Laurel and Hardy
(C) Hardy and Weinberg (D) Watson and Crick
90. The loss of genetic variation from one generation to the next, particularly significant in a small population, is known as
- (A) genetic drift (B) accidental loss
(C) the effect on nonrandom mating (D) natural selection
91. Preferential mating among close relatives is called inbreeding and results in
- (A) Decreased migration (B) Increased survival potential
(C) Increased homozygosity (D) Increased heterozygosity
92. Which of the following is probably true when a population is in Hardy-Weinberg equilibrium?
- (A) There is migration (B) There is random genetic drift
(C) There is natural selection (D) There is random mating

93. The study of macroevolution includes analysis of mass extinctions. The most cataclysmic of these extinction episodes happened _____ when 90% of the marine invertebrates disappeared.
- (A) about 3 billion years ago
 (B) after the Exxon Valdez oil spill
 (C) approximately 225 million years ago
 (D) at the beginning of the Industrial Revolution
94. Another cause of mass extinction would be the impact of an asteroid hitting a planet. This condition was observed in July 1994, when fragments of a comet impacted
- (A) the Nevada desert (B) a coral reef off Africa
 (C) the planet Mars (D) the planet Jupiter
95. Pupal stage can be seen in
- (A) Cow (B) Butterfly
 (C) Goat (D) Bird
96. Corals are
- (A) Cnidaria (B) Platyhelminthes
 (C) Echinodermata (D) Porifera
97. Which are very close to butterfly in phylogenetics relationship?
- (A) Moth (B) Beetle (C) Dragonfly (D) Damselfly
98. Scleractinian corals are colourful due to
- (A) Ink of octopus (B) Watercolour
 (C) Zooxanthallae (D) Industrial waste
99. What is the full form of SCUBA diving
- (A) Self Contained Breathing Apparatus
 (B) Self Controlled Breathing Apparatus
 (C) Self Combined Breathing Apparatus
 (D) Self Controlled Breathing Arrangement
100. What is the basic component of scleractinian corals?
- (A) Iron (B) Calcium (C) Boron (D) Magnesium