

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2013.

Ph.D. (BOTANY)

COURSE CODE : 136

Register Number :

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*Signature of the Invigilator  
(with date)*

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COURSE CODE : 136

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. Ecological study of individual organisms is known as
  - (A) Demography
  - (B) Autoecology
  - (C) Phytosociology
  - (D) Population ecology
2. Which of the following is not a renewable resource?
  - (A) Forest
  - (B) Wild life
  - (C) Coal
  - (D) Water
3. A zone where two distinct communities meet is called
  - (A) Ecocline
  - (B) Association
  - (C) Ecotone
  - (D) Belt transect
4. Pyramid of numbers is usually inverted in
  - (A) Pond ecosystem
  - (B) Grassland ecosystem
  - (C) Forest ecosystem
  - (D) Desert ecosystem
5. Secchi disc is used to measure
  - (A) BOD of water
  - (B) Acidity of water
  - (C) Turbidity of water
  - (D) Wind velocity
6. Which of the following would have least salty water?
  - (A) Sea
  - (B) Ocean
  - (C) Estuary
  - (D) Bay
7. Which of the following refers to the grass land with scattered trees?
  - (A) Priarie
  - (B) Scrub
  - (C) Savannah
  - (D) Wood land
8. Minamata disease results from
  - (A) Oil spills into sea
  - (B) Release of arsenic into atmosphere
  - (C) Release of organic waste into water
  - (D) Release of industrial waste mercury into fishing water

9. Amount of water, a soil can hold against the pull of gravity is known as  
(A) Storage capacity (B) Hygroscopic water  
(C) Field capacity (D) Gravitational water
10. Mangrove vegetation is primarily found in  
(A) Western Ghats (B) Kullu Valley  
(C) Sunderbans (D) Dehra dun Valley
11. Green house effect is due to the presence of  
(A) Ozone layer in the atmosphere (B) CO<sub>2</sub> in the atmosphere  
(C) Moisture in the atmosphere (D) O<sub>2</sub> in the atmosphere
12. Which of the following is not the function of humus in soils  
(A) Keeps the soil cool  
(B) Increases water holding capacity  
(C) Rich source of minerals  
(D) Release of CO<sub>2</sub> which dissolves in soil water to release more mineral salts from the rock below
13. The acidity of the soil can be removed by application of  
(A) Sulphur (B) Urea  
(C) Lime (D) Bog peat
14. Insectivorous plants grow in soils deficient in  
(A) Calcium (B) Nitrogen  
(C) Water (D) Phosphorus
15. Bhopal gas tragedy occurred in  
(A) 1981 (B) 1984  
(C) 1988 (D) 1992
16. A xylem with protoxylem facing the epidermis and meta xylem in centre is called  
(A) Mesarch (B) Endarch  
(C) Exarch (D) Xearch

17. Lenticel develops through the activity of
- |                      |                          |
|----------------------|--------------------------|
| (A) Phellogen        | (B) Intercalary meristem |
| (C) Vascular cambium | (D) Dermatogen           |
18. Bulliform cells are found in the
- |                                |                               |
|--------------------------------|-------------------------------|
| (A) Lower epidermis of grasses | (B) Mesophyll of dicots       |
| (C) Upper epidermis of grasses | (D) Upper epidermis of dicots |
19. The term Rhytidome is commonly used for
- |                  |                   |
|------------------|-------------------|
| (A) Heart wood   | (B) Phloem fibers |
| (C) Growth rings | (D) Outer bark    |
20. Which of the following stomatal type has three unequal subsidiary cells?
- |                |               |
|----------------|---------------|
| (A) Anomocytic | (B) Diacytic  |
| (C) Anisocytic | (D) Paracytic |
21. Conjoint, collateral and open vascular bundles occur in
- |                |                  |
|----------------|------------------|
| (A) Dicot root | (B) Monocot root |
| (C) Dicot stem | (D) Monocot stem |
22. Callose deposition occurs on
- |                    |                  |
|--------------------|------------------|
| (A) Tracheid       | (B) Phloem fibre |
| (C) Ray parenchyma | (D) Sieve plate  |
23. Tyloses are commonly found in
- |                      |                   |
|----------------------|-------------------|
| (A) Secondary phloem | (B) Sap wood      |
| (C) Heart wood       | (D) Primary xylem |
24. A wood lacking vessels is called
- |                  |                    |
|------------------|--------------------|
| (A) Porous       | (B) Non porous     |
| (C) Non vascular | (D) Diffuse porous |

25. Which of the following is not a component of xylem?
- (A) Tracheid (B) Companion cell  
(C) Fibre (D) Vessel
26. Passage cells occur in
- (A) Protoxylem (B) Endodermis  
(C) Cortex (D) Hypodermis
27. Growth rings would be more prominent in a tree from a
- (A) Tropical rain forest (B) Temperate forest  
(C) Subtropical forest (D) Tropical littoral forest
28. Water proofing qualities of cork are due to deposition of
- (A) Lignin (B) Suberin  
(C) Cellulose (D) Fat
29. Casparian strips are found in
- (A) Epidermis (B) Phloem  
(C) Pericycle (D) Endodermis
30. Vascular cambium and cork cambium are examples
- (A) Apical meristem (B) Intercalary meristem  
(C) Lateral meristem (D) Promeristem
31. Safranin stains which element of the tissue
- (A) Cellulose (B) Protein element  
(C) Lignified element (D) Starch element
32. Allelopathy is due to release of
- (A) Pheromones (B) Toxins  
(C) Chemicals (D) Poisons
33. IUCN stands for
- (A) International Union for the Conservation of Nature  
(B) International Unity on Community and Nationality  
(C) Indian Union Congress Nation  
(D) Inter-state Unity on Culture Nature

34. Those species whose populations have been seriously depleted and whose ultimate security is not assured are known as
- (A) Threatened species (B) Vulnerable species  
(C) Endangered species (D) Rare species
35. Forests control drought through
- (A) Lot of water plants  
(B) Increasing rain fall  
(C) Retention of water and prevention of erosion  
(D) Functioning as water shed
36. Animals and plants are best protected in
- (A) Botanical gardens (B) National parks  
(C) Zoos (D) Sanctuaries
37. Bandipur National Park is the site of
- (A) Deer project (B) Elephant project  
(C) Peacock project (D) Tiger project
38. World environment day is
- (A) 28<sup>th</sup> Feb (B) 7<sup>th</sup> Aug (C) 5<sup>th</sup> June (D) 10<sup>th</sup> April
39. An appropriate laxative preparation for an elderly patient who is bedridden is
- (A) Bisacodyl (B) Magnesium sulphate  
(C) Senna (D) Lactulose
40. Part of plant not under the class of organized drug
- (A) Leaves (B) Fruits (C) Flowers (D) Gums
41. Select a drug which is not showing carminative property?
- (A) Dill (B) Senna (C) Mentha (D) Cardamom

42. Glycosides are condensation products of  
 (A) Sugar + aglycone (B) Protein + aglycone  
 (C) Sugar + Protein (D) Fats + aglycone
43. 'Calaber bean' is a synonym for the drug  
 (A) Nux vomica (B) Physostigmine (C) Rauwolfia (D) Vinca
44. The important chemical constituents of *Rauwolfia* is  
 (A) Reserpine (B) Ajmalicine  
 (C) Resercinnamine (D) Desperidine
45. Alcoholic extract of aloe under UV light gives colour  
 (A) Blue (B) Red brown (C) Red (D) Pink
46. One of the following drugs is showing immunomodulatory activity  
 (A) *Panax ginseng* (B) *Polygala senega*  
 (C) *Digitalis purpurea* (D) *Stropanthes kombi*
47. *Dioscoria* is used in the treatment of  
 (A) Ulcer (B) Rheumatic arthritis  
 (C) Cancer (D) Kidney stone
48. Liquorice is used in the treatment of  
 (A) Conjunctivitis (B) Allergy  
 (C) Peptic ulcer (D) Skin disease
49. Saponin glycoside shows one of the following property  
 (A) Laxative (B) Foaming  
 (C) Anticonvalescent (D) Astringent
50. Drug which is having prominent antitussive activity is  
 (A) Morphine (B) Codeine  
 (C) Papaverine (D) Meconic acid

51. The technology that involves silencing of transcriptional RNA
- (A) RNA interference (B) RNA blocking  
(C) Antisense technology (D) Transcriptional inactivation
52. DNA foot printing is a technique for identifying
- (A) DNA-DNA binding (B) Protein –DNA binding  
(C) DNA-RNA binding (D) Protein –RNA binding
53. The study of animals in outer space
- (A) Extraterrestrial biology (B) Exobiology  
(C) Altobiology (D) Aerobiology
54. Anemometer is used for measuring
- (A) Wind speed (B) Speed of light  
(C) Speed of sound waves (D) Current
55. DNA in dehydrated state
- (A) A-DNA (B) Z- DNA (C) B- DNA (D) Triplex DNA
56. Which one is a true statement regarding DNA polymerase used in PCR?
- (A) It is isolated from a virus  
(B) It remains active at high temperature  
(C) It is used to ligate introduced DNA in recipient cells  
(D) It serves as a selectable marker
57. Which one of the following is a case of wrong matching?
- (A) Micropropagation – *invitro* production of plants in large numbers  
(B) Callus-unorganised mass of cells produced in tissue culture  
(C) Somatic hybridization-fusion of two diverse cells  
(D) Vector DNA-site for tRNA synthesis



58. For transformation, microparticles coated with DNA to be bombarded with gene gun are made up of
- (A) Silicon or platinum (B) Silver or platinum  
(C) Gold or Tungsten (D) Platinum or Zinc
59. The linking of antibiotic resistance gene with the plasmid vector became possible with
- (A) Endonucleases (B) Exonucleases  
(C) DNA ligase (D) DNA polymerase
60. Which one of the following bacteria has found extensive use in genetic engineering work in plants
- (A) *Bacillus coagulans* (B) *Clostridium septicum*  
(C) *Xanthomonas citri* (D) *Agrobacterium tumefaciens*
61. A genetically engineered microorganism used successfully in bioremediation of oil spills is a species of
- (A) *Trichoderma* (B) *Bacillus*  
(C) *Pseudomonas* (D) *Xanthomonas*
62. Bacteria that customarily grow in the bottom layers of deep water bodies are usually
- (A) Facultative anaerobe (B) Microaerophile  
(C) Obligate anaerobe (D) Obligate aerobe
63. What do nonsense codons signify?
- (A) Indicates a mutant protein  
(B) Indicates a defective protein  
(C) Errors in the DNA transcription  
(D) Indicates the end of the code for a polypeptide
64. Bacteria typically use repression to control
- (A) Catabolic pathways (B) Protein synthesis  
(C) Anabolic pathways (D) Amphibolic pathways

65. Okazaki fragments are found in
- (A) The leading strand of DNA during its replication
  - (B) DNA that is being synthesized by reverse transcriptase
  - (C) The lagging strand of DA during its replication
  - (D) Ribosomes during protein synthesis
66. The process used in the laboratory to produce millions of copies of DNA is
- (A) Ames assay
  - (B) Fluctuation test
  - (C) *In situ* polymerization
  - (D) Polymerase chain reaction
67. The uptake of naked DNA by a bacterium is called
- (A) Conjugation
  - (B) Transfection
  - (C) Transformation
  - (D) Transduction
68. Generally, plasmids carry which type of genetic material?
- (A) Non essential genes
  - (B) Metabolic genes
  - (C) Essential genes
  - (D) RNA
69. Mobile genetic sequences or "jumping genes" are called
- (A) Bacteriophages
  - (B) Plasmids
  - (C) Transducible elements
  - (D) Transposans
70. Proteins produced by bacteria to inhibit the growth of other strain of the same organism are called
- (A) Vaccines
  - (B) Bacteriocins
  - (C) B factors
  - (D) Antibiotics
71. The first vaccine for human use produced using recombinant DNA technology was the
- (A) Hepatitis B vaccine
  - (B) AIDS vaccine
  - (C) MMR vaccine
  - (D) Polio vaccine

72. Which microorganisms include species associated with red tides?
- (A) Diatoms (B) Water molds  
(C) Dinoflagellates (D) Amoeba
73. Antibiotics are more likely to be produced by
- (A) Plant like protists (B) Fungi  
(C) Algae (D) Lichens
74. The active antimicrobial ingredient in bleach is
- (A) Phenol (B) Hydrochloride  
(C) Hypochlorite (D) Iodine
75. An antibiotic that blocks RNA transcription is
- (A) Streptomycin (B) Cephalosporin  
(C) Rifampin (D) Sulfonamides
76. Antimetabolites that block folic acid synthesis are
- (A) Penicillin (B) Aminoglycosides  
(C) Cephalosporins (D) Sulphonamids
77. A drug of choice for treating systemic fungal infection is
- (A) Nystatin (B) Griseofulvin  
(C) Flucytosine (D) Amphotericin B
78. An antiviral compound that prevents influenza virus from penetrating cells
- (A) Acyclovir (B) Idoxuridine  
(C) Amantadine (D) Vidarabine
79. In an ecosystem, autotrophic organisms would be classified as
- (A) Producers (B) Consumers  
(C) Decomposers (D) Parasites

80. What percentage of nitrogen fixed annually on earth is fixed by the action of bacteria?
- (A) Less than 10% (B) 20%  
(C) 50% (D) 70%
81. The microorganisms that are the primary symbiotic nitrogen fixers are the members of the genus
- (A) *Klebsiella* (B) *Azotobacter*  
(C) *Rhizobium* (D) *Clostridium*
82. The form of the nitrogen that is most usable in plant is
- (A) Nitrate (B) Nitrite  
(C) Molecular nitrogen (D) Ammonia
83. The biological oxygen demand would be most directly affected by the presence of which of the following pollutants?
- (A) Heavy metals (B) Sodium chloride  
(C) Waste minerals from mining (D) Fertilizer run off from farms
84. The micro organism that is mainly used as an indicator of fecal pollution in water is
- (A) *Escherichia coli* (B) *Clostridium tetani*  
(C) *Clostridium botulinum* (D) *Mycobacterium tuberculosis*
85. Which of the waste water treatment is most likely to produce carcinogens as a by product
- (A) Chlorination (B) Ozonation  
(C) Sand filtration (D) Carbon filtration
86. The most common microbiological contamination of air is
- (A) Spores from bacteria (B) Spores from molds  
(C) Gram +ve bacteria (D) Gram -ve bacteria

87. Hallucinogenic compounds can be produced in foods contaminated with *Claviceps purpurea*. This organism is a type of
- (A) Fungus (B) Alga  
(C) Protozoa (D) Bacteria
88. Which of the following microorganisms found on fruits and vegetables would be least likely to cause disease in humans?
- (A) *Salmonella spp.* (B) *Pseudomonas fluorescens*  
(C) *Shigella spp.* (D) *Entamoeba histolytica*
89. A green discoloration on refrigerated meat may be caused by the growth of
- (A) *Pseudomonas syringe* (B) *Rhizopus nigricans*  
(C) *Monilia sitaphilia* (D) *Pseudomonas mephitica*
90. Approximately 50% of the foodborne outbreaks in restaurants that were associated with poultry were caused by
- (A) *Salmonella spp.* (B) *Staphylococcus aureus*  
(C) *Clostridium pefringens* (D) *Escherichia coli*
91. Hens may lay infected eggs if they are infected with
- (A) *Clostridium perfringens* (B) *Escherichia coli*  
(C) *Staphylococcus aureus* (D) *Salmonella pullorum*
92. What component of egg white helps to kill bacteria that may invade the egg?
- (A) Lysozyme (B) Hydrochloric acid  
(C) Hydrogen peroxide (D) Chlorine dioxide
93. Even after food processed by commercial canning, it may contain endospores of
- (A) *Monilia sitophila* (B) *Bacillus stearothermophilus*  
(C) *Rhizopus nigricans* (D) *Clostridium perfringens*

94. The addition of organic acids (benzoic, sorbic, propionic) to food may prevent the growth of human pathogens. The mechanism of action is
- (A) Reduction of protein synthesis                      (B) Disruption of cell membrane  
(C) Lowering of the pH                                      (D) Interfering with DNA replication
95. Which of the following type of microorganism shows promise as a food source because of its ability to grow on waste material and to provide a high amount of protein?
- (A) Algae    (B) Yeasts  
(C) Fungi    (D) Gram +ve bacteria
96. *Spirullina* spp. have been used as a source of food. These microorganisms are a type of
- (A) Cyanobacterium    (B) Fungi  
(C) Yeast    (D) Algae
97. *Aspergillus oryzae* is one of the microorganisms that is used to make
- (A) Hard cheese    (B) Cottage cheese  
(C) Yoghurt    (D) Soy sauce
98. *Thiobacillus ferrooxidans* is useful in mining operations because of its ability to oxidize:
- (A) Sulphur    (B) Iron  
(C) Copper    (D) Silver
99. The viruses that cause encephalitis are most likely to be
- (A) Togo viruses    (B) Entero viruses  
(C) Rabies viruses    (D) Hepatitis viruses
100. Polio infections may cause no symptoms and go unnoticed in
- (A) Small children    (B) Teenagers  
(C) Young adults    (D) Elderly
-