**EXAMINATION OF AQUATIC AND SOIL MYCOLOGY**

**Part One: Aquatic Mycology (82.5 points)**

**QUESTION 1: (41 POINTS)**

**A. Choose the correct answer: (10 points)**

1. Intertidal marine fungi have:

 (a) Thin-walled, superficial ascomata. (b) Thick-walled, deeply immersed ascomata. (c) Thin-walled asci. (d) Thin ascomatal peridial wall.

2. Most of the reported marine fungi belong to:

 (a) Basidiomycota. (b) Anamorphic fungi. (c) Ascomycota.

3. Freshwater fungi are found in:

 (a) Ocean. (b) Sea. (c) Rivers. (d) saline lakes.

4. Direct methods for studying freshwater fungi produce:

 (a) Terrestrial fungi. (b) Freshwater fungi.

 (c) Marine fungi. (d) both fresh and marine fungi.

5. The aeroaquatic hyphomycetes are usually found in:

 (a) Stagnant ponds. (b) Ocean. (c) Sreams. (d) Rivers.

6. The aquatic hyphomycetes were first recognized by:

 (a) Saccardo. (b) Koch. (c) Ingold. (d) Leeuwenhoek.

7. The largest class of freshwater ascomycetes is:

 (a) Leotiomycetes. (b) Dothideomycetes. (c) Sordariomycetes.

8. During single spore isolation, incubated ascospores should be examined after:

 (a) 1-2 day. (b) 3-4 days. (c) 5-6 days. (d) 7-8 days.

9. The causal agent of phytoplankton chytridiomycosis is:

 (a) *Coelomomyces psorophorae*. (b) *Rhizophydium*. (c) *Harpella*. (d) *Asellaria*.

10. Microbes that form the base of the food chain around Hydrothermal vents are:

 (a) Marine fungi. (b) Freshwater fungi. (c) Bacteria. (d) Archaea.

**B. Mark the following sentences with “√” or “×” and correct the wrong sentences: (5 points)**

1. The epipelagic zone is usually low in nutrients. ( )
2. Ingoldian hyphomycetes belong to Ascomycota and Basidiomycota. ( )
3. Most of the Ingoldian hyphomycetes produce hyaline conidia. ( )
4. Most of the hosts of Trichomycetes are terrestrial form. ( )
5. Miscellaneous aquatic anamorphic fungi are mostly saprobes. ( )

**C. Complete the following sentences:** **(10 points)**

1. ……………………. is the largest order of marine fungi.
2. *Annulatascus* species are characterized by ……………, …………... and …………
3. Obligate marine fungi are …………………………………..
4. Substrate of marine fungi include: ….………., ……………. and ……………………
5. The three major groups of anamorphic fungi are: …….……..…….., ……………….... and …………….
6. The Ingoldian hyphomycetes most commonly occur on ……...….. and …….…….....
7. The greatest biodiversity of aquatic fungi occurs in ………. followed by ….…...…
8. Oceanic fungi are characterized by ……..………, ………………… and …………..
9. Species of *Jahnula* are different from *Aliquandostipite* species by having ………… and ………………

**D. Matching - use the key below to answer questions 1 – 4: (4 points)**

 **I. Mitosporangia. II. Meiosporangia. III. Gametothalli. IV. Sporothalli.**

1. Haploid thallus that carry male and female gametes.

 (a) I. (b) II. (c) III. (d) IV.

2.Resistant sporangia that contain melanin pigments and pores.

 (a) I & III. (b) II & IV. (c) II. (d) IV.

3. Thin-walled, elongate, colorless zoosporangia.

 (a) I. (b) II. (c) III. (d) IV.

4. Deploid thalli that carry sporangia.

 (a) I. (b) II. (c) III. (d) IV.

**E.** **Matching - use the key below to answer questions 1 – 6: (6 points)**

  **I. Amoebidiales. II. Asellariales III. Harpellales. IV. Eccrinales.**

1. Their taxonomy is based on the morphology of the basal cell.

 (a) I. (b) II. (c) III. (d) IV.

2. It reproduce asexually by trichospores.

 (a) I. (b) II. (c) III. (d) IV.

3. The only order that produce zygospores.

 (a) I. (b) II. (c) III. (d) IV.

4. It reproduces asexually by the production of arthrospore-like cells.

 (a) I. (b) II. (c) III. (d) IV.

5. It reproduces asexually by the production of amoebae.

 (a) I. (b) II. (c) III. (d) IV.

6. They reproduce asexually by producing sporangiospore.

 (a) I. (b) II. (c) III. (d) IV.

**F. Give the scientific term for each of the following: (6 points)**

1. Copulation between morphologically similar but physiologically different gametes.
2. Entire Chytid’s thallus that may be converted into one or more reproductive structures.
3. Zoosporangia that form operculum through which the zoospores emerge.
4. Sexual reproduction involves fusion between somatic structures.
5. Fissures in a planet's surface from which geothermally heated water issues.
6. Areas of the ocean floor where hydrogen sulfide, methane and other hydrocarbon-rich fluid seepage occurs.

**QUESTION 2: (41.5 POINTS)**

**Write about the following:**

1. Manglicolous fungi. **(6 points)**
2. Host specificity in Trichomycetes. **(6 points)**
3. How to prove the teleomorph/anamorph connections in Ascomycota? **(7 points)**
4. Chytrids in marine habitats. **(7 points)**
5. Collection of freshwater ascomycetes (i.e. types of substrates, informations that need to be documented, incubation and examination of samples). **(15.5 points)**

 **Part Two: Soil Mycology (82.5 points)**

**QUESTION 3: (39.5 POINTS)**

**A. Mark the following sentences with “√” or “×” and correct the wrong sentences:** **(10 points)**

1. Zygomycota species produce monoflagellated zoospores. ( )
2. Cell walls of Saccharomycotina contain very little chitin. ( )
3. Yeasts belong to both Ascomycota and Basidiomycota. ( )
4. Apical ring in the ascus aids in ascospore dispersal. ( )
5. Ascomycota are primary colonizers of most substrates. ( )
6. Ripe fruits are good source of yeast. ( )
7. Fungi live on bark called lignicolous. ( )
8. Ascocarps in Taphrinomycotina are lackingand asci are produced individually. ( )
9. Zygomycetes are delimited and classified by their sexual reproductive structures. ( )
10. Perithecial ascomata contain bitunicate asci. ( )

**B. Choose the correct answer: (10 points)**

1. The principal agents that decay lignin is:

(a) Basidiomycota. (b) Ascomycota. (c) Zygomycota.

2. Basidiomycetes are used in:

 (a) paper production. (b) removal of toxic substances.

 (c) used as food. (d) all of the above.

3. Hymenoascomycetes (Pyrenomycetes) have:

 (a) Pseudothecium. (b) Perithecium.

 (c) Completely closed Cleistothecium. (d) Gymenothecium.

4. Indirect germination of basidiospores produce:

 (a) primary mycelium.(b) secondary mycelium.(c) secondary spore.(d) all of the above.

5. Species of *Taphrina* are mostly …………… on Fagaceae and Rosaceae.

 (a) saprobic. (b) parasitic. (c) symbiotic.

6. Sterile short hyphae that line the inner surface of the ostiole in ascomata are called:

 (a) periphyses. (b) paraphyses. (c) pseudoparaphyses.

7. Mycelium of Basidiomycota is characterized by:

 (a) dark color. (b) coenocytic mycelium.

 (c) the presence of clamp connections. (d) thick and rough walls.

8. Fungi that produce coenocytic mycelia are:

 (a) Basidiomycota. (b) Ascomycota. (c) Zygomycota.

9. Food spoilage fungi are:

 (a) *Aspergillus*. (b) *Penicillium*. (c) yeast. (d) all of the above.

10. Benefits that we get from fungi include:

 (a) food. (b) degrade harmful compounds.

 (c) organic matter decomposer. (d) all of the above.

**C. Complete the following sentences:** **(9.5 points)**

1. Anamorphic fungi belong to …….………………….… and ……………………..…
2. Asexual reproduction in Zygomycota may be by means of ……………, …………, …………….… and ………………………….
3. There are three types of the conidium cell wall origin ……………., ………………. and ………………………………..
4. Pezizomycotina contains three classes namely: ………………….……, ………………….. and ………………………
5. Basidiomycetes are diverse group and include different common forms of basidiocarp namely: ……………………...., ……………………….., …………….……, ……..………….... and …………………….
6. Taphrinomycotina may grow as ……………in naturebut as **………….** in the laboratory.

**D. Give the scientific term for each of the following: (10 points)**

1. The conidium is delimited by a septum before swelling occurs, the conidium originates at a broad area.
2. The capacity of a fungus to produce more than one form or type of spores in its life cycle.
3. It is Consists of a number of hyphae lying parallel to one another and sometimes enveloped in a sheath or cortex.
4. The conidium elongates and swells before being cut off by a septum, the conidium usually originates at a narrow point.
5. Diseases of above-ground plant organs in which the infected twig undergoes repeated branching to form dense tufts of twigs.
6. It distinguished by their smaller size and fewer spores (one to sometimes as many as 30 or so spores).
7. It is the term that is used to describe a fungus in all its experessions - sterile mycelium as well as sexual and asexual reproductive states if they exists.
8. The hyphal cell from which or in which a conidium is formed.
9. Structures in which conidiophores are grouped together.
10. The fruit is wrinkled and shriveled and has a cavity in the centre in place of the stone.

**QUESTION 4: (43 POINTS)**

**A. Compare each pair of the following (use drawing when possible): (16 marks)**

1. Cleistothecium and Pseudothecium Ascomata.
2. Synnemata and Pycnidium.
3. Unitunicate-inoperculate and bitunicate asci.
4. Phialidic and Annellidic conidiation.

**B.Write short notes on: (12 points)**

1. Ascospore features are important in the identification of ascomycetes to genus and particularly to species level explain that.
2. General characteristics of Basidiomycota.

**C. Explain the following sentences with drawing only: (15 points)**

1. Life cycle of *Rhizopus stolonifer*.
2. How asci are formed from two morphologically different gametangia?
3. Clamp connection in Basidiomycota.

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With all Best Wishes

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