



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2024/2025

### SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL MICROBIOLOGY

#### HMM 3215: MEDICAL MYCOLOGY

DATE: JANUARY 2024

TIME: 3 HOURS

#### INSTRUCTIONS:

Answer *All* questions

Ensure that all your answers are properly numbered

Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark

Part II: Short Answer Questions – Answer questions following each other on the answer booklet

Part III: Long Answer Questions – Answer each question on the answer booklet

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#### SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. Which of the following organisms is the causative agent of 'Darling's disease'?
  - a. *Paracoccidioides braziliensis*
  - b. *Exophiala werneckii*
  - c. *Histoplasma capsulatum*
  - d. *Blastomyces dermatitidis*
2. The fungi with Daisy-like spore arrangement is
  - a. *Blastomyces dermatitidis*
  - b. *Cryptococcus neoformans*
  - c. *Paracoccidioides braziliensis*

*d. Sporothrix schenckii*

3. Which antifungal drug Inhibits 13-(1,3)-D-glucan synthesis, which usually makes the crossbridges in the fungal cell wall thereby inhibiting its formation.
  - a. Amphotericin
  - b. 5-fluorocytosine
  - c. The azoles
  - d. Terbinafine
4. Fungi often colonize lesions due to other causes. Which of the following is least likely to be present as colonizer
  - a. Candida
  - b. Sporothrix
  - c. Mucor
  - d. Aspergillus
5. A girl who pricked her finger while pruning some rose bushes develops a local pustule that progresses to an ulcer. Several nodules then develop along the local lymphatic drainage. The most likely agent is
  - a. *Aspergillus fumigatus*
  - b. *Sporothrix schenckii*
  - c. *Cryptococcus neoformans*
  - d. *Candida albicans*
6. Immunocompromised persons suffer from several fungal diseases. Which of the following is the least frequently associated
  - a. *Cryptococcus neoformans*
  - b. *Aspergillus fumigatus*
  - c. *Malassezia furfur*
  - d. *Mucor* species
7. Each of the following statements concerning *Cryptococcus neoformans* are correct EXCEPT
  - a. Its natural habitat is the soil, especially associated with pigeon feces
  - b. Budding yeasts are found in the lesions

- c. The initial site of infection is usually the lung
  - d. Pathogenesis is related primarily to the production of exotoxin A.
8. Fungal cells that reproduce by budding are seen in the infected tissues of patients with
- a. Candidiasis, cryptococcosis, and sporotrichosis
  - b. Mycetoma, candidiasis and mucormycosis
  - c. Tinea corporis, tinea unguium, and tinea versicolor
  - d. Sporotrichosis, mycetoma and aspergillosis
9. Which of the following is not the characteristics of histoplasmosis
- a. Person to person transmission
  - b. Specific geographic distribution
  - c. Yeasts in tissue
  - d. Mycelial phase in the soil
10. Infection with dermatophyte is most often associated with
- a. Intravenous drug abuse
  - b. Inhalation of the organism from contaminated bird feces
  - c. Adherence of the organism to perspiration moist skin
  - d. Fecal-oral transmission
11. Each of the following statements concerning *Candida albicans* is correct except
- a. *C. albicans* is a budding yeast that forms pseudohyphae when it invades tissue
  - b. *C. albicans* causes thrush
  - c. *C. albicans* is transmitted primarily by respiratory aerosol
  - d. Impaired cell mediated immunity is an important predisposing factor to disease
12. The bread mold *Rhizopus stolonifer* belongs to which of the following fungal divisions?
- a. Ascomycota
  - b. Deuteromycota
  - c. Oomycota
  - d. Zygomycota
13. The number of sets of chromosomes in a dikaryotic cell
- a. Is greater than diploid cell

- b. Is lesser than diploid cell
  - c. Is equal to diploid cell
  - d. Is equal to haploid cell
14. Which of the following is the cause of sporotrichosis?
- a. *Coccidioides immitis*
  - b. *Sporothrix schenckii*
  - c. *Cryptococcus neoformans*
  - d. *Histoplasma capsulatum*
15. Which of the following is NOT true regarding treatment of tinea capitis?
- a. 1-2 months
  - b. Terbinafine cream
  - c. Shampoo used frequently
  - d. Topical azoles
16. Fungi that are more virulent and cause disease in healthy hosts are classified as?
- a. Superficial
  - b. Cutaneous
  - c. Subcutaneous
  - d. Systemic
17. Which of the following is not dimorphic and is the only medically important encapsulated yeast?
- a. *Histoplasma capsulatum*
  - b. *Cryptococcus neoformans*
  - c. *Coccidioides immitis*
  - d. *Candida albicans*
18. Which drug do fungi take it up using a permease that our cells do not make? It gets incorporated into the fungal RNA in place uracil.
- a. Amphotericin
  - b. 5-fluorocytosine
  - c. Terbinafine c

- d. Caspofungin
- 19. Which antifungal drug inhibits cytochromes (cytochrome 1)450)? This prevents ergosterol formation, which disrupts membrane function and growth
  - a. Amphotericin
  - b. 5-fluorocytosine
  - c. Terbinafine
  - d. The azoles
- 20. Which of the following shows up as typical "ringworm" lesions
  - a. Tinea barbae
  - b. Tinea capitis
  - c. Tinea cruris
  - d. Tinea unguium

#### **SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)**

1. Describe the pathological effects of aflatoxins on human health. [8 marks]
2. Highlight different types of media used to culture fungi and their purposes. [8 marks]
3. Distinguish between aspergillosis and cryptococcosis in terms of etiology and symptoms. [8 marks]
4. Write short notes on immunological methods for diagnosis of fungal infections. [8 Marks]
5. List three common dermatophytes and describe how hairs plucked from a patient's head can be used for their laboratory identification. [8 Marks]

#### **SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)**

1. Discuss diseases caused by *Candida albicans* as well as the respective clinical features diagnosis and treatment. [20 Marks]
2. (a) State three opportunistic infections caused by fungi, the parts of the human body that may be affected, and the name(s) of the etiological agent(s). [9 Marks]
  - (b) Describe four types of fungal spores. [8 Marks]
  - (c) Outline laboratory diagnosis of eumycetoma [3 Marks]

3. Discuss fungal pneumonia under the following headings

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|-----------------|-----------|
| a) Aetiology    | [3 Marks] |
| b) Transmission | [4 Marks] |
| c) Pathogenesis | [8 Marks] |
| d) Diagnosis    | [5 Marks] |