



**MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF PUBLIC HEALTH BIOMEDICAL SCIENCES AND TECHNOLOGY**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES**

**BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES**

**ACADEMIC YEAR: 2019/2020**

**SEMESTER: 2**

**COURSE CODE: BML 225**

**COURSE TITLE: MEDICAL MYCOLOGY**

**MAIN EXAM**

**DATE: 9<sup>TH</sup> DECEMBER 2020**

**TIME: 8.00 -10.00AM**

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**INSTRUCTIONS:**

**ANSWER ALL QUESTIONS**

**TIME: 2 Hours**

MMUST observes ZERO tolerance to examination  
cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

Section A: Multiple choice questions (MCQ's) (20mks)

1. Which one of the following is not a factor of fungal pathogenicity?
  - a) Ability to adhere to host cells by way of cell wall glycoproteins
  - b) Production of capsules allowing them to resist phagocytosis
  - c) Ability to secrete mycotoxins
  - d) Most fungi are mesophilic and cannot grow at temperatures above 37 °C
2. Fungi that are not known to produce any sexual spores are known as-----
  - a) Basidiomycetes
  - b) Ascomycetes
  - c) Zygomycetes
  - d) Deutromycetes
3. Which one of the following is not dimorphic and is the only medically important encapsulated yeast?
  - a) *Histoplasma capsulatum*
  - b) *Cryptococcus neoformans*
  - c) *Coccidioides immitis*
  - d) *Sporothrix schenckii*
4. Which statement regarding fungal growth and morphology is correct?
  - a) Pseudohyphae are produced by all yeasts.
  - b) Molds produce hyphae that may or may not be partitioned with cross-walls or septa.
  - c) Conidia are produced by sexual reproduction.
  - d) Most yeasts reproduce by budding and lack cell walls.
5. Immunocompromised persons suffer from several fungal diseases. Which one of the following is not frequently associated
  - a) *Cryptococcus neoformans*
  - b) *Aspergillus fumigatus*
  - c) *Malassezia furfur*
  - d) Mucor species
6. Echinocandins perturb cell wall synthesis; inhibit 1, 3- $\beta$ -D-glucan synthase. Which one of the following belong to this class of antifungals.
  - a) Anidulafungin
  - b) Fluconazole
  - c) Amphotericin B
  - d) Voriconazole
7. Which one of the following antifungals is a polyene
  - a) Nystatin
  - b) Ergosterol
  - c) Caspofungin
  - d) Flucytosine
8. Which one of the following infections is introduced into the body through inhalation of infectious fungal spores
  - a) Paracoccidioidomycosis
  - b) Aspergillosis
  - c) Mycetoma
  - d) White piedra
9. Which one of the following is the cause of sporotrichosis?
  - a) *Coccidioides immitis*
  - b) *Sporothrix schenckii*
  - c) *Cryptococcus neoformans*
  - d) *Histoplasma capsulatum*
10. Which one of the following fungi infect keratinized layers only
  - a) Opportunistic fungi
  - b) Cutaneous fungi
  - c) Subcutaneous fungi
  - d) Systemic fungi

11. Which one of the following is characteristic of Griseofulvin?
  - a) Given intravenously
  - b) Given topically
  - c) Is commonly used for treatment of dermatophyte infection
  - d) Its administered intramuscularly
12. Infections from fungi occur mostly due to:
  - a) Disruption of the protective barriers of the skin and the mucosa
  - b) Immunosuppression
  - c) Occupational contact
  - d) Inhalation of zoospores
13. Which one of the following fungal agents cause mycosis that can be diagnosed by a latex agglutination test on the spinal fluid for capsular polysaccharide antigen.
  - a) *Cryptococcus neoformans*
  - b) *Histoplasma capsulatum*
  - c) *Aspergillus fumigatus*
  - d) *Candida albicans*
14. Which one of the following combinations of mycoses can be diagnosed by demonstrating fungal cells that reproduce by budding in the infected patient's tissues?
  - a) Candidiasis, Cryptococcosis, and Sporotrichosis
  - b) Mycetoma, candidiasis and mucormycosis
  - c) Tinea corporis, tinea unguium, and tinea versicolor
  - d) Sporotrichosis, mycetoma and aspergillosis
15. Which one of the following is a subcutaneous Mycosis known as "rose-thorn or rose-gardeners' disease"?
  - a) Cryptococcosis
  - b) Histoplasmosis
  - c) Sporotrichosis
  - d) Tinea cruris
16. Which antifungal drug blocks squalene epoxidase enzyme to prevent squalene conversion to ergosterol.
  - a) Amphotericin B
  - b) 5-fluorocytosine
  - c) Terbinafine
  - d) The azoles
17. Which statement regarding dermatophytosis is correct?
  - a) Chronic infections are associated with zoophilic dermatophytes, such as *Microsporum canis*.
  - b) Acute infections are associated with zoophilic dermatophytes, such as *M canis*.
  - c) Chronic infections are associated with anthropophilic dermatophytes, such as *M canis*.
  - d) Acute infections are associated with anthropophilic dermatophytes, such as *M canis*.
18. Which statement regarding the laboratory identification of fungi is correct?
  - a) *Histoplasma capsulatum* typically requires less than 48 hours of incubation to yield positive cultures from clinical specimens.
  - b) Since many saprobic (nonpathogenic) molds resemble dimorphic mycotic agents in culture at 30 °C, the identification of putative dimorphic pathogenic fungi must be confirmed by conversion to the tissue form in vitro or by the detection of species-specific antigens or DNA sequence analysis.
  - c) A positive germ tube test provides a rapid presumptive identification of *Candida glabrata*.
  - d) Budding yeast cells and abundant pseudohyphae are typical of *Pneumocystis jiroveci*.
19. Which statement about blastomycosis is correct?
  - a) Similar to other endemic mycoses, this infection occurs equally in men and women.
  - b) Infection starts in the skin, and the organisms commonly disseminate to the lungs, bone, genitourinary tract, or other sites.
  - c) The disease is endemic to certain areas of South America.
  - d) In tissue, one finds large, thick-walled, single budding yeast cells with broad connections between the parent yeast and bud.
20. The host mechanism of immunity to fungal infection can be innate or acquired; which one of the following describes cell mediated immunity?

- a) Physical barriers
- b) Delayed hypersensitivity
- c) Mucous membrane along with their secretions and normal flora.
- d) Other factors like pH, body temperature and phagocytic cells.

Section B: short answer questions (SAQ's) (40mks)

1. State the difference between slime molds and true fungi (3 marks)
2. Define the following terms as used in mycology (4mks)
  - a. Septate hyphae
  - b. Ascus
  - c. Mycotoxicoses
  - d. Conidia
3. Describe the general morphology of fungi (5mks)
4. List examples of mycoses and state the types of specimens collected for identification of fungi (5mks).
5. Describe the staining techniques used for identification of fungi and their importance in a mycology laboratory (5mks)
6. Describe the culturing of fungi for diagnosis of mycoses (5mks)
7. State the difference between subcutaneous and systematic mycoses, giving an example of fungi under each class (4mks)
8. Thermal dimorphism is a phenomenon that occurs in many true pathogenic fungi. Define what it is and give three examples of fungi that exhibit this property. What function does this adaptation probably serve in nature and/or in the host? (5mks)
9. Discuss the clinical manifestations of Candidiasis and outline the clinical materials for the infections' laboratory diagnosis (4 marks)

Section C: Long answer questions (LAQ's) (60mks)

1. Discuss the clinical presentation and laboratory diagnoses of superficial mycoses (20mks)
2. Discuss the three general types of reproduction recognized in fungi (20 marks)
3. Describe the Germ tube test and its importance in a Medical mycology laboratory (20mks)