| Reg. No | | | | | | | | | | | | | | | |
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# B.Tech DEGREE EXAMINATION, NOVEMBER 2023

Fifth Semester

## 18BTE424T - MOLECULAR BIOLOGY OF INFECTIOUS DISEASES

*(For the candidates admitted during the academic year 2020 - 2021 & 2021 - 2022)*

**Note:**

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

**Time: 3 Hours** **Max. Marks: 100**

**PART - A (20 × 1 = 20 Marks)**

Answer **all** Questions

| | | Marks | BL | CO |
|---|---|---|---|---|
| 1. | The ability of a pathogen to produce the toxin is known as<br>(A) toxigenicity (B) pathogenicity<br>(C) virulence (D) invasiveness | 1 | 1 | 1 |
| 2. | Which component of Gram negative cell wall will induce fever in lab animals?<br>(A) outer membrane (B) lipid A<br>(C) O antigen (D) core polysaccharide | 1 | 1 | 1 |
| 3. | Phase of infection with mild and non specific symptoms of the disease is<br>(A) incubation period (B) convalescence<br>(C) prodromal stage (D) acute infection | 1 | 1 | 1 |
| 4. | Example of an air borne fungal infection is<br>(A) tuberculosis (B) influenza<br>(C) malaria (D) histoplasmosis | 1 | 1 | 1 |
| 5. | *M. tuberculosis* shows acid fastness due to presence of<br>(A) Lipid A (B) peptidoglycan<br>(C) mycolic acid (D) lipopolysaccharide | 1 | 1 | 2 |
| 6. | Cholera toxin B subunit binds to<br>(A) GM-1 receptor (B) ACE receptor<br>(C) CD45 receptor (D) acetylcholine receptor | 1 | 1 | 2 |
| 7. | *Helicobacter pylori* resists the acidic pH of stomach by secretion of<br>(A) protease (B) amylase<br>(C) urease (D) lipase | 1 | 1 | 2 |
| 8. | Which molecular test is used to determine viral load<br>(A) PCR (B) LAMP -PCR<br>(C) multiplex PCR (D) Real time quantitative PCR | 1 | 1 | 2 |
| 9. | Site of action of rabies virus is<br>(A) Enterocytes (B) Neurons<br>(C) hepatocytes (D) macrophages | 1 | 1 | 3 |
| 10. | To which family of viruses, HIV belongs to?<br>(A) togaviridae (B) reoviridae<br>(C) retroviridae (D) orthomyxoviridae | 1 | 1 | 3 |
| 11. | Example of oncogenic virus is<br>(A) Poliovirus (B) Hepatitis virus<br>(C) pox virus (D) influenza virus | 1 | 1 | 3 |

| | | | | |
|---|---|---|---|---|
| 12. | Morphological changes that occur due to viral growth in cell culture is known as<br>(A) transformation (B) contact inhibition<br>(C) cytopathic effect (D) virus interference | 1 | 2 | 3 |
| 13. | Infective stage of malarial parasite is<br>(A) schizont (B) trophozoite<br>(C) sporozoite (D) merozoite | 1 | 1 | 4 |
| 14. | The causative agent of syphilis is<br>(A) Treponema pallidum (B) Neisseria gonohorrea<br>(C) Yerisinia pestis (D) Candida albicans | 1 | 1 | 4 |
| 15. | Bead based diagnostic test for laboratory diagnosis of parasitic diseases is<br>(A) PCR (B) RT-PCR<br>(C) LAMP-PCR (D) Luminex | 1 | 1 | 4 |
| 16. | The larval stage of filarial parasite that infects man is<br>(A) first stage larvae (B) second stage larvae<br>(C) third stage larvae (D) microfilariae | 1 | 1 | 4 |
| 17. | Enzyme produced by pathogens that causes destruction of antibodies is<br>(A) beta-lactamase (B) IgA protease<br>(C) streptokinase (D) lecithinase | 1 | 1 | 5 |
| 18. | Low molecular weight iron binding proteins produced by pathogens are known as<br>(A) invasins (B) defensins<br>(C) siderophores (D) mucin | 1 | 1 | 5 |
| 19. | Identify the gene carrying mutation that causes drug resistance to streptomycin<br>(A) rpoB (B) ermB<br>(C) katG (D) rpsL | 1 | 2 | 5 |
| 20. | Enzyme that adds the sialic acid groups to LOS is<br>(A) glycosyl transferase (B) glycosylhydrolase<br>(C) sialyltransferase (D) fructosyltransferase | 1 | 1 | 5 |

**PART - B (5 × 4 = 20 Marks)**

Answer **any 5** Questions

| | | Marks | BL | CO |
|---|---|---|---|---|
| 21. | Differentiate between exotoxins and endotoxins. | 4 | 1 | 1 |
| 22. | What are pathogenicity islands and its role in infection? | 4 | 1 | 2 |
| 23. | Write a note on continuous cell lines used for virus cultivation. | 4 | 1 | 3 |
| 24. | List the virulence factors of *Candida albicans* and its function. | 4 | 1 | 4 |
| 25. | How does antigenic drift occur in influenza virus. | 4 | 1 | 5 |
| 26. | Write a note on phase variation. | 4 | 1 | 6 |
| 27. | Write about the molecular diagnosis of HIV. | 4 | 1 | 3 |

**PART - C (5 × 12 = 60 Marks)**

Answer **all** Questions

| | | Marks | BL | CO |
|---|---|---|---|---|
| 28. | (a) Elaborate on modes of pathogen entry and initiation of disease with examples | 12 | 1 | 1 |
| | **(OR)** | | | |
| | (b) Write about waterborne diseases with examples | | | |

| | | | | |
|---|---|---|---|---|
| 29. | (a) Write about pathogenesis and molecular diagnosis of *Helicobacter* infection | 12 | 1 | 2 |
| | **(OR)** | | | |
| | (b) Write about pathogenesis and molecular diagnosis of typhoid infection | | | |
| 30. | (a) Elaborate on the molecular techniques used for diagnosis of viral infections | 12 | 1 | 3 |
| | **(OR)** | | | |
| | (b) Write in detail about the methods for cultivation of viruses | | | |
| 31. | (a) Write about the pathogenesis and molecular biology of filariasis | 12 | 1 | 4 |
| | **(OR)** | | | |
| | (b) Write about the life cycle and pathogenesis of sleeping sickness | | | |
| 32. | (a) Explain about complement pathway inhibition and defense against competition shown by pathogens | 12 | 1 | 5 |
| | **(OR)** | | | |
| | (b) Explain about multiple drug resistance mechanisms with examples | | | |

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