

MANIPAL UNIVERSITY

MBBS PHASE I STAGE II DEGREE EXAMINATION – AUGUST 2015

SUBJECT: MICROBIOLOGY – I (ESSAY)

Friday, August 21, 2015

Time: 09:00 – 11:00 Hrs.

Max. Marks: 60

✍ Answer ALL the questions.

1. With suitable diagrams, compare and contrast the features of gram positive and gram negative bacterial cell wall.

(6 marks)
2. 12 year old Henry was suffering from aplastic anemia. After HLA typing of his sibling's marrow, he underwent an allograft transplant. After about 4 months of the procedure he developed malaise, skin rashes, dry eyes and sensitivity in and around his mouth. Thinning of hair was also noticed. He was instituted on appropriate management.
 - 2A. What is your diagnosis of the above condition?
 - 2B. What are the requirements for this reaction to occur?

(1+3 = 4 marks)
3. Discuss the laboratory diagnosis of lymphatic filariasis.

(4 marks)
4. Discuss dry heat sterilization with hot air oven as an example.

(4 marks)
5. A 40 year old man was brought to the hospital with history of fever, severe headache and myalgia. On examination GP noticed that he was disoriented. CT scan showed a temporal lobe lesion. Viral etiology was suspected. The patient responded well to acyclovir.
 - 5A. Name the possible etiology of the above condition.
 - 5B. Discuss its pathogenesis.

(1+3 = 4 marks)
6. Describe the clinical manifestations of aspergillosis in immunocompromised patients.

(3 marks)
7. A 10 year boy while playing football injured himself on the leg. After two days, the wound became inflamed and started oozing creamy yellow pus. The swab taken from the wound on gram stain revealed gram positive cocci in clusters and pus cells. Culture showed golden yellow hemolytic colonies on blood agar. The boy was treated appropriately.

- 7A. What is the probable etiological agent associated with the above condition?
7B. Enumerate the virulence factors of this agent and discuss their role in the pathogenesis of the aforesaid condition.
7C. How do you confirm your diagnosis?
(1+3+2 = 6 marks)
8. State the transmission and clinical manifestation of Coxsackie viral infections.
(4 marks)
9. A 35-year-old man was hospitalized with more than two weeks of step ladder type of fever, malaise, anorexia, myalgia and constipation. On examination, erythematous maculopapular rashes were seen on his upper abdomen that blanched on pressure, along with a palpable spleen. His blood culture reported the growth of motile, gram negative bacilli that were transmitted feco-orally.
- 9A. Name the most probable agents in the above mentioned case
9B. Explain briefly its laboratory diagnosis.
(1+5 = 6 marks)
10. Discuss the morphological forms of *Entamoeba histolytica* with the help of neat labeled diagrams.
(4 marks)
11. John, a 45 yr old man came to the hospital complaining of cough for the last several months. On examination he was found febrile. He also complained of night sweats, fatigue and loss of weight. His sputum was blood tinged and on special staining revealed several pink rods in a blue background. A chest radiograph indicated lung opacities in the upper lobe.
- 11A. Identify the most common agent associated with this condition.
11B. Discuss the pathogenesis of this condition.
(1+4 = 5 marks)
12. Explain the antigenic variations seen in influenza virus and discuss their significance.
(5 marks)
13. Pinky, a 9 year old girl was admitted to the hospital with 30% burn wounds after an injury from fire works. Few days later the burn wound got infected and started oozing blue pus which was sent to the microbiology laboratory for investigations. The isolate was oxidase positive.
- 13A. What is the most probable etiological agent?
13B. Discuss the pathogenesis with emphasis on the role of toxins and enzymes produced by this agent.
(1+4 = 5 marks)



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MANIPAL UNIVERSITY

MBBS PHASE I STAGE II DEGREE EXAMINATION – AUGUST 2015

SUBJECT: MICROBIOLOGY – II (MCQs)

Friday, August 21, 2015

Time: 11:30 – 12:30 Hrs.

Max. Marks: 120

INSTRUCTIONS

1. For each statement, select **T** (True) or **F** (False) as your choice.
2. Indicate your choice by darkening the appropriate circle in the answer sheet provided.
3. Use only HB or 2B pencils to darken the circle.
4. Leave blank for Don't Know response.
5. Scoring systems is as follows:

For every Correct response	1 mark is awarded
For every Wrong response	0.5 mark is deducted
For every Don't Know response	No mark is deducted
6. Indicate your roll number (Registration Number) clearly and correctly.
7. Do not write anything in the question paper.
8. The true/false statements are numbered 101 to 160 and 201 to 260 (Total 120 statements).
9. This question paper contains **04 pages**. Please make sure that the question paper provided to you has all the pages.

Viruses

101. Are capable of independent replication
102. Are classified based on the type of nucleic acid they possess
103. Like agents, lacking nucleic acids are termed as prions
104. Growing in the amniotic cavity of embryonated egg is exemplified by orthomyxovirus

Following pairs correctly match the fungus with the type of mycoses

105. *Sporothrix schenckii* : Cutaneous mycoses
106. *Trichophyton rubrum* : Systemic mycoses
107. *Cryptococcus neoformans* : Subcutaneous mycoses

Bacterial flagellum

108. Is demonstrated using hanging drop technique
109. Arises from the cell wall
110. Is peritrichously arranged in *Klebsiella* species

Immune response

111. Of primary type has a lag period of 7-10 days
112. Of secondary type is mediated by IgG antibodies
113. Towards helminthes is mediated by IgE
114. During anaphylaxis is controlled by desensitization

Type IV hypersensitivity reaction

115. Is exemplified by Arthus reaction
116. Involve lymphocytes
117. Is passively transferred through serum
118. Manifests as wheal and flare reaction in tuberculin test

Hapten

119. Is immunogenic by itself
120. Has low molecular weight
121. Fails to activate T helper cells
122. Induced hypersensitivity reactions are seen in contact dermatitis

Yellow fever

123. Has hematemeses as its complication
124. Is transmitted from human to human by *Haemagogus* spp

125. Is prevented by Salk vaccine
126. Is diagnosed by detection of virus specific IgM antibodies

Lyme disease is

127. Caused by *Borrelia recurrentis*
128. Transmitted by hard ticks of the genus *Ixodes*
129. Characterized by erythema chronicum migrans
130. Diagnosed by demonstration of the organism by dark ground microscopy of blood

Microorganisms evade mechanisms of the innate immunity by

131. Interfering with activation of classical complement pathway
132. Producing proteins like transferrins
133. Producing molecules that increases the action of interferons
134. Interfering with ciliary action
135. Getting a coating of IgA antibodies

Bacillus anthracis

136. Is a gram negative bacterium
137. Produces terminal bulging spores
138. Is aerobic
139. Produces medusa head like colonies on culture medium

Following organisms correctly match with the laboratory tests done for their identification

140. *Haemophilus influenzae* : Satellitism
141. *Streptococcus pneumoniae* : CAMP test
142. *Neisseria meningitidis* : Optochin sensitivity test
143. *Corynebacterium diphtheriae*: Nagler's test

Naegleria fowleri

144. Has amoeboid form as the invasive form for humans
145. Is isolated by culture on chocolate agar
146. Meningitis presents with turbid CSF containing polymorphonuclear cells

Creutzfeldt Jacob disease is

147. A prion disorder
148. Transmitted from human to human through corneal grafts
149. Characterised by spongiform appearances in the brain

Trichophyton

- 150. Infection is characterized by maculopapular lesions
- 151. Infects both skin and nails
- 152. Has conidiophores as infective forms
- 153. Produces club shaped macroconidia
- 154. Induces 'id' reaction in the infected individuals

A 30 year old business executive, presented to the medicine OPD with symptoms of nausea and recurrent pain in the upper abdomen which did not respond to the symptomatic therapy for the last 3 months. The treating physician suspected peptic ulcer with infectious etiology

- 155. The agent associated with the above condition is *Helicobacter pylori*
- 156. It belongs to family Enterobacteriaceae
- 157. Infection leads to septicemia
- 158. Enzyme urease is one of its virulence factors
- 159. It is grown on Skirrow's medium

In lepromatous leprosy

- 160. Depigmented macules appear on the skin
- 201. The cell mediated immunity of the patient is poor
- 202. Plenty of bacilli are observed in the lesion

Human papilloma virus

- 203. Is an enveloped virus
- 204. Causes vacuolation in the cells of the basal layer of skin
- 205. DNA remains latent in the infected cells
- 206. Belongs to poxviridae family

Food borne botulism

- 207. Is caused by gram positive bacillus
- 208. Is mediated by superantigen
- 209. Manifests as spastic paralysis
- 210. Is diagnosed by mouse protection test

Enterohemorrhagic Escherichia coli

- 211. Has O157:H7 as the most common serotype
- 212. Produces verotoxin
- 213. Infection in humans complicates to renal failure
- 214. Causes traveller's diarrhea
- 215. Produces pink coloured colonies on sorbitol-MacConkey's agar

Schistosoma mansoni infection

- 216. Results in liver damage due to the inflammatory responses to the adult worms
- 217. Is transmitted through cercaria
- 218. Is diagnosed by the demonstration of operculated eggs

Hepatitis C virus

- 219. Is the commonest cause of transfusion associated hepatitis
- 220. Is a double stranded DNA virus
- 221. Has got single genotype
- 222. Is cleared from host with the help of cytotoxic T cells
- 223. Infection leads to carrier state

Trichuris trichiura

- 224. Is also known as pin worm
- 225. Eggs are barrel-shaped
- 226. Completes its life cycle in two hosts
- 227. Infection leads to iron deficiency anemia
- 228. Is a hermaphrodite

Diphtheria

- 229. Is caused by a bacterium having metachromatic granules
- 230. Is transmitted by air borne droplets
- 231. Toxin inhibits protein synthesis by ADP-ribosylation of elongation factor 2
- 232. Toxin is coded by a temperate bacteriophage
- 233. Is prevented by a killed vaccine

Respiratory syncytial virus

- 234. Is an enveloped virus
- 235. Causes pneumonia in infants
- 236. Possesses haemagglutinin and neuraminidase property on a single spike
- 237. Infection is prevented by immunization with live attenuated vaccine
- 238. Belongs to the family Orthomyxoviridae

Adenovirus

- 239. Is an enveloped RNA virus
- 240. Has pentons for attachment to the host cell
- 241. Exists as a single serotype
- 242. Causes pharyngoconjunctival fever

Pneumocystis jiroveci

- 243. Multiplies in alveolar macrophages
- 244. Has cysts as the infective form for humans
- 245. Is isolated by HeLa cell culture
- 246. Causes disseminated infections in immunocompromised individuals

Regarding syphilis

- 247. Reagin antibodies are detected using specific tests
- 248. Microscopic examination of smear from maculopapular rashes reveal treponemes
- 249. VDRL test employs cardiolipin antigen
- 250. Fluorescent treponemal antibody-absorption test for IgM is used to diagnose congenital syphilis
- 251. Tabes dorsalis is seen during secondary stage

With reference to laboratory diagnosis of HIV infection

- 252. ELISA for gp120 antibodies is positive in early acute phase
- 253. Antibody titre to p24 antigen remains high in the latent phase
- 254. Delayed type hypersensitivity reaction is intact in full blown AIDS
- 255. Intranuclear inclusion bodies are seen in infected cells
- 256. Diagnosis is confirmed using Western blot

Mycoplasma hominis

- 257. Is acid fast
- 258. Colonies have 'fried egg' appearance
- 259. Releases the enzyme urease
- 260. Causes urethritis

