

- (h) Segmented genome is a characteristic feature of _____ virus.
- (i) _____ is the largest DNA virus.
- (j) The ova of *Ancylostoma duodenale* is _____ stained.

2021

MICROBIOLOGY

Paper – II

Full Marks : 100

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION – A

1. Answer any one : 2 + 5 + 8
- (i) Classify Hepatitis viruses.
- (ii) Describe the morphology and genomic structure of hepatitis B virus.
- (iii) Describe the laboratory diagnosis of infections caused by hepatitis B virus. Add a note on prophylaxis available.

(2)

Or

- (i) Draw a labelled diagram of HIV and describe its morphology.
- (ii) Describe the pathogenesis of HIV infection.
- (iii) Write in detail the laboratory diagnosis of HIV.

2. Write short notes : $2\frac{1}{2} \times 2$

- (i) Cytopathic effect
- (ii) Dimorphic fungi.

3. Write short notes on any five : 2×5

- (i) Antigenic shift and antigenic drift
- (ii) Occult filariasis
- (iii) Rhinosporidiosis
- (iv) Prions
- (v) Cerebral malaria
- (vi) Negri bodies.

(3)

4. Clinical scenario questions : 2×5

- (a) A 29-years-old female came to casualty with complaints of high grade fever, severe joint pain, back pain, myalgia and petechial rashes all over the body. A provisional diagnosis of dengue hemorrhagic fever was made. What is the pathogenesis underlying the clinical condition ?
- (b) A 32-years-old male with history of HIV/ AIDS presented to the casualty with high grade fever, headache and seizures. CSF microscopy revealed budding yeast cells surrounded by a halo. What is the etiological diagnosis ? Discuss its laboratory diagnosis.
- (c) A 25-years-old female presented to the STD clinic with complaints of vaginal discharge since 5 days. Vaginal discharge microscopy revealed trophozoites with jerky motility. What is the etiological diagnosis ? Discuss its pathogenesis and treatment.

(4)

- (d) A 18-years-old female presented with high grade fever, which rises every third day with chills and rigor. Her blood sample was subjected to a rapid diagnostic test which was positive for Plasmodium vivax. Discuss the laboratory diagnosis and treatment for the same.
- (e) A 65-years-old patient with complaints of dry cough, sore throat and fever visited a hospital. His throat swab was sent for COVID-19 testing, which came positive. Discuss the infection control measures to prevent the transmission of this disease.

5. Multiple choice questions :

1 × 10

- (i) Most appropriate site of inoculation of fertilized egg for vaccine production of influenza virus is
- (a) Amniotic sac
 - (b) Allantoic cavity
 - (c) Chorion-allantoic membrane
 - (d) Yolk sac

(5)

- (ii) All the following vaccines are live attenuated except.
- (a) Sabin polio vaccine
 - (b) Mumps
 - (c) Measles
 - (d) Salk polio vaccine
- (iii) Latent viral infections are common in.
- (a) Adeno virus
 - (b) Herpes
 - (c) Picorna
 - (d) Influenza
- (iv) Which of the following viruses is transmitted by sexual intercourse ?
- (a) B. K virus
 - (b) J. C virus
 - (c) Hepatitis B virus
 - (d) Hepatitis A virus

- (v) The vector which transmits the *kyasnur forest disease* (KFD) virus is :
- (a) Mosquito
 - (b) Ticks
 - (c) Sandfly
 - (d) Flea
- (vi) A gardener presents with chronic progressive swelling on the leg with discharging sinuses. The most probable diagnosis is :
- (a) Sporotrichosis
 - (b) Histoplasmosis
 - (c) Mucormycosis
 - (d) Mycetoma
- (vii) Ergot alkaloids are toxins produced by :
- (a) *Aspergillus flavus*
 - (b) *Fusarium* sp.
 - (c) *Claviceps purpurea*
 - (d) *Penicillium rubrum*

- (viii) Germ tube test is diagnostic for :
- (a) *Candida glabrata*
 - (b) *Candida albicans*
 - (c) *Cryptococcus neoformans*
 - (d) *Coccidioides immitis*
- (ix) Most of the pathogenic fungi belong to which of the following classes ?
- (a) Ascomycetes
 - (b) Basidiomycetes
 - (c) Zygomycetes
 - (d) Deuteromycetes
- (x) *Penicillium marneffei* is a :
- (a) Yeast
 - (b) Yeast-like
 - (c) Mould
 - (d) Dimorphic fungus

SECTION – B

6. Answer any one : $2 + 7 + 6$

- (a) Name the parasites causing malaria.
- (b) Describe the lab diagnosis of malaria.
- (c) Write about the complications of Falciparum malaria.

Or

- (a) What are dermatophytes ? Name the various genera of dermatophytes.
- (b) Write down the pathogenesis and clinical types.
- (c) Describe the lab. Diagnosis of dermatophytic lesions.

7. Write short notes : $2\frac{1}{2} \times 2$

- (i) Prophylaxis of rabies
- (ii) Laboratory diagnosis of Kala-azar.

8. Write short notes on any five : 2×5

- (i) Inclusion bodies
- (ii) Epstein-Barr virus (EBV)
- (iii) Larva migrans
- (iv) Candidiasis
- (v) COVID-19
- (vi) Mycotoxins.

9. Clinical scenario questions : 2×5

- (a) A 45-years-old nurse came to the department of hospital infection control with history of needle stick injury. The source is unidentified. Discuss the post exposure prophylaxis in this case.
- (b) Enumerate the viruses with oncogenic potential. Discuss the mechanism of oncogenicity of the virus that causes 'Carcinoma cervix'.

(c) A 43 years old farmer presented with chronic swelling on the leg with a history of sinuses discharging granules.

(i) Identify the clinical condition and name the probable causative agents.

(d) A 55 years old farmer, a known asthmatic was admitted for evaluation of chronic productive cough. On admission, he had high grade fever and his chest X-ray showed lobular infiltrates. On staining with Gram stain, his sputum showed numerous eosinophils and fungal filaments with septate hyphae at 45° angle branching.

(i) Identify the clinical condition and name the organism associated with this infection.

(ii) Name the other diseases caused by this organism.

(e) A 58 years old female presented with chronic watery diarrhea. She was seropositive for HIV and her stool microscopy showed acid-fast

oocysts measuring 5 microns in diameter. What is the likely etiological agent ? Name the other pathogens producing similar clinical presentation.

10. Fill in the blanks :

1 × 10

(a) _____ fungi is present abundantly in the faeces of pigeons ? .

(b) Free living amoebae causing keratitis is _____ .

(c) Tinea versicolor is caused by _____ .

(d) _____ is the skin test done in hydatid disease.

(e) SSPE is a complication of _____ virus infection.

(f) Histoplasma capsulatum is a _____ fungi in morphological classification of fungus.

(g) Oral thrush is caused by _____ .