

- (c) The term "significant bacteruria" is used in UTI when bacterial count is _____.
- (d) The species of salmonella responsible for food poisoning is _____.
- (e) The Pigment Produced by Pseudomonas aeruginosa is _____.
- (f) The causative agent of plague is _____.
- (g) The concentration of H_2SO_4 used as decolouriser in Z-N stain method for Mycobacterium leprae is _____.
- (h) Fried egg colonies on culture medium seen in _____.
- (i) Epidemic typhus is caused by _____.

2021

MICROBIOLOGY

Paper — I

Full Marks : 100

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION — A

1. Answer any one : 5 + 5 + 5
- (i) (a) Define Sterilisation and mention Spaulding's classification of medical devices.
- (b) Enumerate different physical methods of sterilization.
- (c) Describe the principle and use of autoclave.

(Turn Over)

Or

- (ii) (a) Enumerate various antigen-antibody reactions.
- (b) Mention about the principle of precipitation reaction.
- (c) Briefly describe the applications of precipitation reaction.

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

- (i) Koch's Postulate
- (ii) Conjugation.

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

- (i) Enrichment Media
- (ii) Passive Immunity
- (iii) Superantigen
- (iv) Interferons
- (v) Chemical sterilant
- (vi) Cell wall acting antimicrobial agents.

4. Clinical scenario : 2×5

- (a) A nurse is recording the temperature of patients in a ward using a clinical thermometer. Mention the disinfectant used to clean the thermometer after use in each patient.
- (b) A strain of *S. aureus* isolated from pus is resistant to vancomycin. Mention the mechanism of resistance. What is the drug of choice ?
- (c) After penicillin administration, antibodies developed that resulted in haemolysis. What type of hypersensitivity is this ? Give another example of such type of hypersensitivity.
- (d) Now-a-days cases of neonatal tetanus are very less due to immunization of pregnant mothers. Mention the type of immunity seen here.
- (e) A foul smelling necrotised tissue from road traffic accident patient has come to your laboratory. Mention the appropriate culture media you will choose for inoculation.

5. Multiple choice questions : 1×10

- (i) Who is known as father of Microbiology
- (a) Paul Ehrlich
 - (b) Louis Pasteur
 - (c) Kitasato
 - (d) Joseph Lister
- (ii) Which of the following bacteria is cell wall deficient.
- (a) Salmonella typhi
 - (b) Escherichia coli
 - (c) Mycoplasma
 - (d) Treponema Pallidum
- (iii) Glutaraldehyde is used for sterilization of
- (a) Cystoscopes
 - (b) Broncho scopes
 - (c) Endoscopes
 - (d) All of the above

- (iv) All of the following are examples of enriched media except.
- (a) Blood Agar
 - (b) Loeffler's serum slope
 - (c) Chocolate agar
 - (d) Bile salt agar
- (v) Anaerobic jar is commonly used to grow
- (a) Clostridium tetani
 - (b) E.Coli
 - (c) Pseudomonas aeruginosa
 - (d) None of the above
- (vi) Transfer of genetic information through free or naked DNA is known as.
- (a) Transformation
 - (b) Transduction
 - (c) Conjugation
 - (d) Lysogenic conversion.

(vii) Which is the first immunoglobulin to appear in response to an antigen.

- (a) IgG
- (b) IgE
- (c) IgM
- (d) IgA

(viii) VRDL Test is an example of

- (a) Agglutination
- (b) ELISA
- (c) Flocculation test
- (d) Immunofluorescence

(ix) Alternative pathway of complement is initiated by

- (a) Endotoxins
- (b) Lipopolysaccharides
- (c) Yeast cell walls
- (d) All of the above

(x) CD8 cell can recognize

- (a) MHC class I antigen
- (b) MHC class II antigen
- (c) MHC class III antigen
- (d) All of the above

SECTION – B

6. Answer any one :

5 + 5 + 5

(i) Young adult female of 19 years was admitted with abdominal discomfort and fever. Fever was remittent type with gradual rise in a step ladder fashion. O/E she was toxic with temperature of 102°F with coated tongue.

- (a) Discuss about the most probable diagnosis and its pathogenesis.
- (b) Discuss about the laboratory diagnosis in detail.
- (c) Add a note on vaccination available for this clinical condition.

Or

(ii) A 25 years old male was admitted with low grade fever loss of weight and chronic cough with expectoration for past 2 months. Sputum examination revealed long slender acid fast bacilli.

- (a) Mention about the most probable diagnosis and it's pathogenesis.
- (b) Discuss about the lab diagnosis in detail.
- (c) Mention briefly about the drug resistance that can occur in this condition.

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

- (i) Halophilic Vibrio
- (ii) Standard tests for syphilis (STS).

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

- (i) Scrub typhus.
- (ii) Enterotoxigenic E.Coli

(iii) Nagler Reaction

(iv) Elek's gel precipitation test

(v) Non-suppurative complication of Streptococcus pyogenes infection

(vi) Non-gonococcal urethritis (NGU).

9. Clinical scenario : 2×5

(i) 60 years old male came to OPD with complaints of severe pain in lateral aspect of right thigh and some pus discharge from ingrown hair. Pus was aspirated sent for examination which revealed gram +ve cocci in clusters.

(a) What could be the probable etiological agent.

(b) List 2 virulence factors of this organism.

(ii) A Child of 5 years with high grade fever, toxic, pain in throat was brought to the casualty. On examination, a white patch was found on the fauces. No history of immunization is available.

- (a) What could be the clinical diagnosis and causative agent.
- (b) Mention about the vaccine used for this disease.
- (iii) 8 years old girl admitted to the hospital with acute onset of fever, neck rigidity and altered sensorium for past 2 days. Microscopic examination of CSF showed gram +ve lanceolate diplococci surrounded by a clear halo.
 - (a) Mention about the clinical diagnosis and etiological agent.
 - (b) Name a culture media that will be used for growth of this organism.
- (iv) A 25 years old female patient has visited the OPD with chief complaint of dysuria and increased frequency of micturition for past few days. She was advised for culture of the urine which revealed lactose fermenting colonies on MacConkey agar.

- (a) What is the clinical diagnosis, mention about the most probable pathogen.
 - (b) Name the two organisms which also ferment lactose in MacConkey agar.
 - (v) A 42 years old male developed severe watery diarrhoea. The stool collected has a rice water type of appearance. On culture non-lactose fermenting colonies seen in MacConkey agar and the bacteria showed darting motility on hanging drop preparation.
 - (a) What could be the probable diagnosis and the etiological agent.
 - (b) Mention about the transport media that should be used for transportation of the stool sample to the laboratory.
10. Fill in the blanks : 10
- (a) Draughtsman colony is characteristic feature of _____.
 - (b) Selective media used for isolation of *Neisseria gonorrhoeae* is _____.