The West Bengal University of Health Sciences
1st BMLT September, 2023 Examination

Subject: General and Systemic Bacteriology

Time: 3 hrs **Full Marks: 100**

*Attempt **all** questions*

1. Answer the following questions : 20 x 1

a) Catalase positive, beta hemolytic staphylococcus :
i) *S aureus.* ii) *S epidermidis.*
iii) *S saprophytic.* iv) None.

b) In the case of neonatal meningitis, the etiologic bacteria was found to have properties of ß-hemolysis, bacitracin resistance, CAMP positive. Which of the following is the most likely causative agent?
i) *S agalactiae.* ii) *Streptococci pneumonae.*
iii) *Streptococci mutans.* iv) *Streptococci bovis.*

c) Majority of strains of Staphylococci are highly resistant to which of the following antibiotics?
i) Cephalosporin ii) Clotrimazole
iii) Amphotericin. iv) Penicillin.

d) Name the constituent found in the cell wall of gram-positive cocci :
i) Lipopolysaccharide. ii) Teichoic acid. iii) Mycolic acid. iv) Endotoxins.

e) Which of the following is true?
i) Nutrient broth is basal medium.
ii) Addition of selective substances in a solid medium is called enrichment media
iii) Agar has nutrient properties.
iv) Chocolate medium is selective medium.

f) Which of the following is rich source of B vitamins?
i) Yeast extract. ii) Beef extract. iii) Peptone. iv) Agar.

g) What is the concentration of agar in solid media?
i) 3 to 4%. ii) 1.5 to 2 %. iii) 10 to 15.5 %. iv) 0.5 to 1%.

h) Which of the following is anaerobic medium?
i) Robertson cooked-meat medium. ii) Nutrient agar.
iii) Nutrient broth iv) Mac-conkey agar.

i) Which of these is exposed on the outer surface of a gram-negative bacterium?
i) Braun lipoprotein. ii) O-antigen of lipopolysaccharide.
iii) Polysaccharide portion of lipoteichoic acid. iv) Electron transport system components.

j) What is a cluster of polar flagella called?
i) Peritrichous. ii) Monotrichous. iii) Amphitrichous. iv) Lophotrichous.

k) When rod shaped bacteria appears in pairs, it is known as?
i) Diplobacilli. ii) Streptobacilli. iii) Diplococci. iv) Staphylococci.

l) Transport media for Streptococcus is :
i) Pikes's media. ii) VR media. iii) Amies media. iv) Cary blair media.

m) Lancified classification is based in which of the following?
i) M protein. ii) T protein. iii) Carbohydrate Ag. iv) None of the above.

n) Carrom coin appearance of colonies is seen for :
i) S pyogens. ii) S agalactiae. iii) Viridans Streptococci. iv) S pneumonia.

o) Bacterial cell wall is made up of :
i) Chitin. ii) Cellulose. iii) Peptidoglycan. iv) Dextran.

p) The bond present between NAG & NAM is :
i) β 1,4 glycosidic bond. ii) β 1,6 glycosidic bond.
iii) α 1,6 glycosidic bond. iv) α 1 glycosidic linkage.

q) Bacterial flagella is made up of :
i) Flagellin. ii) Microtubules. iii) Spinin. iv) Tubulin.

r) Sterilization is done by autoclave consisting of exposure to steam about :
i) 121^0C. ii) 131^0C. iii) 140^0C. iv) 110^0C.

s) The organisms which grow best above 20°C are called :
i) Thermophillic. ii) Psychrophillic.
iii) Mesophillic. iv) Thermoduric.

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t) Elek's gel preparation test is for :
   i) Gonococcus. ii) Botulinum.
   iii) Diphtheria. iv) Tetanus.

2. Answer the following questions : 5 x 2
   a) What is selective media? Give two example of it.
   b) Name two bacteria which are both catalase and oxidase positive.
   c) Write down the classification of streptococcus.
   d) Differentiate between Pasteurization & Sterilization.
   e) Write down the biological control of following method of sterilization.
      i) Ethylene oxide. ii) Filtration. iii) Hot air oven. iv) Autoclave.

3. Answer ***any six*** of the following : 6 x 5
   a) Bacterial growth curve. b) Gram negative bacterial cell wall.
   c) Coagulase test. d) VDRL test.
   e) Cell membrane. f) Phenolic compound.
   g) Transduction. h) Staphylococcal toxic shock syndrome.

4. Answer ***any one*** question :
   a) A 4 years old boy developed severe watery diarrhea and vomiting. The stool collected has a rice water type of appearance. 1+1+1+3+4
      i) What is your probable diagnosis?
      ii) Write down the name of the causative agent.
      iii) What are the transport media for that organism?
      iv) Write down the pathogenesis responsible for the clinical condition.
      v) How will you confirm the case in the laboratory?
   b) A 25 year old heterosexual male came with history of dysuria and noted some 'pus like' drainage. His physical examination showed yellow urethral discharge and tenderness at the tip of penis. Examination of the urethral discharge revealed intracellular gram negative diplococci with plenty of pus cells. 1+1+3+5
      i) What is your probable diagnosis?
      ii) Write down the name of the causative agent.
      iii) How will you confirm the case in the laboratory?

5. Answer ***any two*** questions :
   a) A young adult female was admitted to the hospital with intense headache, abdominal discomfort for 5days.She had also developed fever which is remittent type with gradual rise in step ladder fashion. Her tongue was coated and mild splenomegaly was present. 1+1+5+8
      i) What is your probable diagnosis?
      ii) Write down the name of the causative agent.
      iii) Write down the pathogenesis responsible for the clinical condition.
      iv) How will you confirm the case in the laboratory?
   b) A 55 year old male was admitted to the hospital with complaints of severe pain in the lateral aspect of his left calf & small amount of pus discharge from the ingrown hair. On physical examination, the local area was found to be red, warm, and tender. Gram stain showed gram positive cocci in clusters & culture on blood agar shows beta hemolytic colonies. 1+1+3+2+8
      i) What is your probable diagnosis?
      ii) Write down the name of the causative agent.
      iii) List the infections caused by this organisms.
      iv) List the virulence factor of this organism
      v) How will you confirm the case in the laboratory?
   c) A 4 year old girl from Bhubaneswar was brought to emergency room by her parents due to an acute onset of fever, neck rigidity and altered sensorium for past 2 days. Physical examination showed that her neck was passively flexed, her legs also flexed. Direct examination of the CSF showed gram negative, lanceolate shaped diplococci surrounded by a halo. 1+1+2+3+8
      i) What is your probable diagnosis?
      ii) Write down the name of the causative agent.
      iii) List the virulence factor of this organism.
      iv) How will you confirm the case in the laboratory?