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DE-2927

B. Sc. (Microbiology) (Sem. I) Examination

March / April – 2016

MB-02 : Cell Structure & Function in Bacteria

Time : **2** Hours] [Total Marks : **50**

સૂચના/Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. Sc. (Microbiology) (Sem. I)**

Name of the Subject :

☛ **MB-02 : Cell Structure & Function in Bacteria**

☛ Subject Code No. : **2 9 2 7** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) પ્રશ્ન પત્રમાં કુલ ૫૦ પ્રશ્નો છે, બધાજ ફરજીયાત છે. દરેક પ્રશ્નનો (૧) એક ગુણ છે.
There are 50 questions each question carries (1) mark and all are compulsory.

(3) દરેક પ્રશ્નનો કાળજીપૂર્વક અભ્યાસ કરી સાચો વિકલ્પ પસંદ કરો.
Read the question carefully before selecting the correct option.

***O.M.R. Sheet* ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ *O.M.R. Sheet*ની પાછળ છાપેલ છે.**

Important instructions to fillup O.M.R. Sheet is given on back side of the provided O.M.R. Sheet.

1 What is/are the unusual shapes of bacteria ?
(A) Tightly coiled shaped
(B) Appendaged bacteria
(C) Filamentous bacteria
(D) All of above

2 Bacteria can easily adopt to new environment because of their :
(A) Small size
(B) Large size
(C) Moderate size
(D) Mega size

3 Membrane is stabilized with ions like _____ and _____ forming ionic bonds with negative charge on the phospholipids.
(A) Mg^{2+}, Ca^{2+}
(B) Co^{2+}, Mn^{2+}
(C) Mg^{2+}, $C1^{2-}$
(D) Mn^{2+}, Ca^{2+}

4 Carbon storage polymers are :
(A) PHB
(B) Glycogen
(C) Both PHB and Glycogen
(D) None of above

5 Which layer of spore contains peptidoglycan in its composition ?
(A) Spore wall
(B) Cortex
(C) Exosporium
(D) Core wall

6 What is the average diameter of bacterial flagellum ?
(A) 20 μm
(B) 200 μm
(C) 300 μm
(D) 30 μm

7 Which generic term is commonly used to describe polymers made up of C_4- C_{18} carbons ?
(A) Polytrihydroxyalkalies
(B) Polydihydroxyalkanoates
(C) Polyhydroxyacetates
(D) Polyhydroxyalkanoates

8 Molecules which freely penetrates the membrane:
(A) NaCI
(B) H_2O
(C) Sugars
(D) None of above

9 Name two sugar derivatives used in formation of peptidoglycan layer :
(A) N-acetylgalactoseamine & N-acetylmuramic acid
(B) N-acetylgalactosamine & N-acetylmuramic acid
(C) N-acetylglucosamine & N-acetylgalactoseamine
(D) N-acetylglucosamine & N-acetylmuramic acid

10 Habitat of Epulospisciumfishelsoni is found in :
(A) Shark fish
(B) Whales
(C) Surgeon fish
(D) All above

11 How do bacteria sense presence of Attractant or Repellent ?
(A) Photoreceptors present on flagella.
(B) Chemolipids on the cell wall.
(C) Chemoreceptors present on cell surface.
(D) Chemosignals present on capsule.

12 Which kind of unusual taxis is observed in some gliding Cyanobacteria ?
(A) Hydrotaxis
(B) Chemotaxis
(C) Phototaxis
(D) Magnatotaxis

13 What is the function of Calcium dipicolinic acid complex ?
(A) Reduces water availability within spores.
(B) Intercalates with DNA and stabilizes it.
(C) Both (A) and (B)
(D) Formation of four layers of spores.

14 Microorganism accumulate inorganic phosphate in form of :
(A) Metaphosphate
(B) Polymetaphosphate
(C) Organic phosphate
(D) None of above

15 Which of the following are the examples of coma, spiral, cocci and rod shaped bacteria respectively ?

(A) Vibrio, Bacillus, Streptococcus, Spirochete

(B) Bacillus, Vibrio, Streptococcus, Spirochete

(C) Vibrio, Spirochete, Streptococcus, Bacillus

(D) Vibrio, Bacillus, Streptococcus, Staphylococcus

16 The metabolic rate of cell is :

(A) Inversely proportional to the square of its size

(B) Directly proportional to its size

(C) Directly proportional to cube of its size

(D) Inversely proportional to the size of cell

17 Which one is not an Endospore forming bacteria ?

(A) Clostridium

(B) Corynebacterium

(C) Bacillus

(D) Staphylococcus

18 Which organelle is responsible for providing buoyancy to cells floating in water ecosystem ?

(A) PHB granules

(B) Magnetosomes

(C) Gas vesicles

(D) Carboxysomes

19 Gas vesicles are intracellular gas filled structures composed of :

(A) Carbohydrates

(B) Lipids

(C) Proteins

(D) Mineral

20 Which material is produced by Cyanobacteria to exhibit gliding motility ?

(A) Protein slime

(B) Polysaccharide slime

(C) Lipoidal slime

(D) Amino acid slime

21 State the diameter of largest prokaryotic bacteria.
(A) 750 µm, Thiomargarita (B) 600 µm, Epulopiscium
(C) 800 µm, Cyanobacteria (D) 500 µm, Thiobacillus

22 The membrane that separates the cytoplasm of cell from its environment is :
(A) Nuclear membrane (B) Mitochondrial membrane
(C) Cytoplasmic membrane (D) Golgi body

23 Peptidoglycan is a characteristic constitute of the cell wall of :
(A) Bacteria and Cyanobacteria
(B) Bacteria and Unicellular eukaryotes
(C) Archaebacteria and Eukaryotes
(D) None of above

24 Where is MS ring present in flagella ?
(A) Cytoplasmic membrane (B) Periplasm
(C) Cytoplasm (D) Outer membrane

25 What do you mean by peritrichous arrangement of flagella ?
(A) Flagella present at a single pole
(B) Flagella present all over bacterial surface
(C) Flagella present on both the poles of cell
(D) Single flagella present at a single pole

26 State the synonym of protoplast :
(A) Spheroplast (B) Mesoplast
(C) Neoplast (D) Schizoplast

27 Archeal and bacterial cell wall lacks :
(A) N-acetylmuramic acid and DAP
(B) N-acetylmuramic acid and lysine
(C) N-acetylglucosamine and DAP
(D) N-acetylglucosamine and lysine

28 Mutation in bacteria act as :
(A) Raw material of evolution
(B) Raw material of sporulation
(C) Raw material of reproduction
(D) Raw material of germination

29 Endospores are highly resistant to :
(A) Heat (B) Harsh chemicals
(C) Radiations (D) All of above

30 Some bacteria lack flagella but are still able to move across solid surfaces. This process is called :
(A) Swimming (B) Gliding
(C) Rotation (D) Glistening

31 Name the hapanoids present in the membrane of prokaryotes :

(A) C_{30} hapanoiddiploptene

(B) C_{21} hapanoidmonoploptene

(C) C_{30} hapanoidmonoploptene

(D) C_{21} hapanoiddiploptene

32 When cocci divide in random or multiple planes. It generates an irregular shape which occurs in organisms belonging to the genus :

(A) Streptococcus

(B) Staphylococcus

(C) Streptobacilli

(D) Sarcina

33 Sugars present in the cell wall are linked by :

(A) α-1,4 glycosidic linkage

(B) β-1,4 glycosidic linkage

(C) α-1,6 glycosidic linkage

(D) β-1,6 glycosidic linkage

34 The enzyme that is responsible for destroying the cell wall of Gram positive bacteria is :

(A) Pectinase

(B) Protease

(C) Lysozyme

(D) Chitinase

35 The nature of cytoplasmic membrane that remains exposed to the external environment is :

(A) Hydrophobic

(B) Hydrophilic

(C) Hydrostatic

(D) Both Hydrophilic and Hydrostatic

36 _____ Proteins function as a motor switch, reversing the direction of rotation of the flagella in response to intracellular signals :

(A) Mot

(B) Fli

(C) flagellin

(D) Cap

37 Full form of PHB :

(A) Poly beta hydroxyl butyrate

(B) Poly beta hydroxyl butyrate

(C) Para hydroxyl butyrate

(D) Poly hydroxyl butyrate

38 What is the outer membrane in Gram negative bacteria known as ?

(A) Peptidoglycan

(B) Lipopolysaccharide

(C) Technic acid

(D) Polysaccharides

39 What is shape of Magnetosomes ?

(A) Spike

(B) Square

(C) Rectangle

(D) All of above

40 Which protein is present for the formation of filament of flagella ?

(A) flagellin

(B) flillin

(C) keratin

(D) Collagen

41 Name the spiral shape bacteria found in nature :
(A) Streptococcus (B) Staphylococcus
(C) Spirochetes (D) Bacillus

42 Membrane proteins function as :
(A) Transport proteins
(B) Carrier molecules
(C) Permeases
(D) All of the above

43 Where are fagellin molecules synthesized ?
(A) Periplasm (B) Cytoplasm
(C) Cell wall (D) Cell membrane

44 Which of the following chemical is thought to be responsible for resistance of endospores ?
(A) Dipicric acid
(B) Calcium
(C) Dipicolinic acid
(D) Both Calcium and Dipicolinic acid

45 State the major lipids of Archaea :
(A) Glycerol diethers (B) Plopanoids
(C) Diplopanoids (D) Chaparons

46 Glycoprotein containing glutamic acid as a sole source of amino acid is found in which organism ?
(A) Methanogens (B) Methanosarcina
(C) Methanococcus (D) Natronococcus

47 Most proteins are present in which area of Gram positive cell ?
(A) Cytoplasmic membrane
(B) Cytoplasm
(C) Peptidoglycan layer
(D) Outer layer

48 The time taken for sporulation in Bacillus subtilis is :
(A) 8 hours (B) 10 hours
(C) 6 hours (D) 5 hours

49 Flagellar revolution per second is :
(A) 400 (B) 300
(C) 200 (D) 600

50 Prokaryotes show motility by :
(A) Pili (B) Fimbriae
(C) Sex pilus (D) Flagella