



AAU-003-001426      Seat No. \_\_\_\_\_

### B. Sc. (Sem. IV) (CBCS) Examination

**April / May - 2016**

## 401 - Cell Biology & Plant Biochemistry

**Faculty Code : 003**

**Subject Code : 001426**

Time :  $2\frac{1}{2}$  Hours ]

[ Total Marks : 70

**1** Select the correct answer for the questions from the given **20** choices :

- (1) Which of the following enzyme is a marker enzyme for Golgi complex?

- (A) Acid phosphatase  
(B) Insulin Receptor  
(C) Succinate Dehydrogenase  
(D) Glycosyl transferase

- (2) What is the biochemical nature of PRIONS?

- (A) Protein                      (B) DNA  
(C) Polysaccharide            (D) RNA

- (3) Which of the following technique can be useful to study the arrangement of microtubules in a cell?

- (A) Light microscopy  
(B) X-ray Diffraction  
(C) Fluorescence Microscopy  
(D) None of the above

- (4) Which of the following sub cellular compartment of an animal cell contain highest amount of RNA?

- (A) Nucleus                      (B) Mitochondria  
(C) Cytoplasm                 (D) Lysosomes

- (5) A nuclear envelope forms around each set of sister chromatids in
- (A) metaphase
  - (B) telophase
  - (C) prophase
  - (D) interphase
- (6) In somatic cell cycle
- (A) In G1 phase DNA content is double the amount of DNA present in the origin cell
  - (B) G0 phase follows mitotic phase
  - (C) A short interphase is followed by long mitotic phase
  - (D) DNA replication takes place in S phase
- (7) Homologous chromosomes are
- (A) Morphologically and genetically similar
  - (B) Morphologically similar
  - (C) Those which pair during synapsis
  - (D) None of these
- (8) During meiosis crossing over occurs at
- (A) Diplotene
  - (B) leptotene
  - (C) Pachytene
  - (D) Diakinesis
- (9) What kind of amino acid R groups are exposed on the surface of integral membrane proteins?
- (A) Polar amino acid R groups
  - (B) Acidic and basic amino acid R groups
  - (C) Non-polar amino acid R groups
  - (D) None of the above

- (10) Which of the following protein is an example of intermediate filaments and a constituent of cytoskeleton?
- (A) Actin (B) Myosin  
(C) Tubulin (D) Keratin
- (11) Which of the following are important constituents of ORS and used for treatment of diarrhoea and dehydration?
- (A) Calcium and glucose  
(B) Potassium and glucose  
(C) Potassium and amino acids  
(D) Sodium and glucose
- (12) Identify the antibiotic from the following list that can act as an ionophore.
- (A) Penicillin (B) Gramicidin  
(C) Tetracycline (D) Streptomycin
- (13) Assume a thylakoid is somehow punctured so that the interior of the thylakoid is no longer separated from the stroma. This damage will have the most direct effect on which of the following processes?
- (A) the splitting of water  
(B) the absorption of light energy by chlorophyll  
(C) the flow of electrons from photosystem II to photosystem I  
(D) the synthesis of ATP
- (14) CAM plants keep stomata closed in daytime, thus reducing loss of water. They can do this because they
- (A) fix  $\text{CO}_2$  into organic acids during the night.  
(B) fix  $\text{CO}_2$  into sugars in the bundle-sheath cells.  
(C) fix  $\text{CO}_2$  into pyruvate in the mesophyll cells.  
(D) use the enzyme phosphofructokinase, which outcompetes rubisco for  $\text{CO}_2$ .

(15) In tissue culture, low cytokinins to auxin ratio causes.....

- (A) root differentiation
- (B) shoot differentiation
- (C) both (A) and (B)
- (D) none of these

(16) All are functions of gibberellins except

- (A) promote cell elongation
- (B) promote elongation of internodes
- (C) promote dormancy
- (D) promotes parthenocarpic fruit formation

(17) Among the given bacteria which can be the chemoheterotroph?

- (A) Desulphovibrio
- (B) Mycobacterium
- (C) Rhodospirillum
- (D) Beijerinckia

(18) Which of the following components are associated with Nitrate reductase activity?

- (1) Reduced pyridine nucleotide
- (2) Flavin adenine dinucleotide
- (3) Molybdenum
- (4) Boron

Select the correct answer using following codes :

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|----------------------|----------------------|
| (A) (1), (2) and (3) | (B) (1) and (2)      |
| (C) (2), (3) and (4) | (D) (1), (3) and (4) |

- (19) A nutrient medium given to any explants provides
- (A) water
  - (B) minerals
  - (C) growth regulators
  - (D) all of above
- (20) Which of the following plant having glyphosate as active ingredient ?
- (A) Glyphos
  - (B) Tumble weed
  - (C) Roundup
  - (D) all of the above

**2** (a) Answer any three of the following questions : **6**

- (1) Why RBCs are not classified as true cells?
- (2) Give the difference between cytokinesis of animal and plant cells.
- (3) Give the source of nitrogen.
- (4) Write the advantage of synthetic seeds.
- (5) List the factors stabilizing and destabilizing the lysosomal membrane.
- (6) What is Kranz anatomy?

(b) Answer any three of the following questions : **9**

- (1) Describe the effects of penicillin and lysozyme on bacterial cell wall.
- (2) Explain simple diffusion and write the examples of substances transported by simple diffusion.
- (3) Write the short notes about the callus culture.
- (4) What is photorespiration?
- (5) With well labelled diagram, explain the role of abscisic acid in drought condition.
- (6) Write about the various checkpoints in cell cycle.

- (c) Answer any two of the following questions : 10
- (1) Draw a labelled diagram of an animal cell and plant cell and write the important differences between animal and plant cells.
  - (2) Explain process of mitosis along with its physiological significance.
  - (3) Write a short note on Ionophores
  - (4) Give the biochemistry and  $N_2$  fixation method of Nitrogenase enzyme.
  - (5) Compare and contrast between  $C_3$  and  $C_4$  pathway?
- 3 (a) Answer any three of the following questions : 6
- (1) Justify the structural diversity in eukaryotic cells by giving examples.
  - (2) Why the number of chromosomes is reduced to half during the process of meiosis?
  - (3) Give the difference between ethylene and ethephon.
  - (4) Write the differences between simple and facilitated diffusion with suitable examples.
  - (5) Write about plant tissue culture media.
  - (6) What is nitrogen cycle? Draw the diagram.
- (b) Answer any three of the following questions : 9
- (1) Write the biological significance of meiosis.
  - (2) Write a note on E.coli as model organism for various biological studies.
  - (3) Define marker enzymes and write examples of marker enzymes for different cell organelles.
  - (4) Give the detail about virus resistant plant with example.
  - (5) Briefly describe structure and function of RUBISCO enzyme.
  - (6) Discuss three commercial uses of auxins.

(c) Answer any two of the following questions : **10**

- (1) Describe in detail about cell cycle.
  - (2) Write a short note on sodium/potassium- ATPase and its functions.
  - (3) Write the comparison of prokaryotic and eukaryotic cell.
  - (4) What is synthetic seed? Explain in brief.
  - (5) Explain Light reaction of photosynthesis.
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