REV-00
BBT/70/75

2017/12

B.SC. BIOTECHNOLOGY
SEMESTER-3RD
BIOPHYSICAL CHEMISTRY
BBT-301

Duration: 3 Hrs. **Marks: 70**

Part : A (Objective) = 20
Part : B (Descriptive) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins. **Marks: 50**

[Answer question no. One (1) & any four (4) from the rest]

1. Define uncertainity principle. How is it expressed mathematically? 2+8=10

2. Define an orbital. What designation are given to orbitals with n=4, l=1and n=4, l=3? 2+8=10

3. Define Osmosis and Diffusion? State the difference between Osmosis and Diffusion with the help of an experiment? 10

4. What is radioactivity? Discuss the characteristics of the particles emitted? 2+8=10

5. What do you understand by relative lowering in vapour pressure? Show that it is a colligative property? 2+8=10

6. What is osmotic pressure? How does it depend upon the temperature and atmospheric pressure? 2+8=10

7. What is protein folding. Explain the mechanism of protein folding? Explain the role of chaperone proteins in folding? 2+4+4=10

8. How is DNA different from RNA? Explain the structure of DNA? What are nucleotides and nucleosides? 2+5+3=10

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[PART-A : Objective]

Choose the correct answer from the following : **1X20=20**

1. $[ML^{-1}T^{-2}]$ is the dimensional formula of
   a. Force
   b. Coefficient of friction
   c. Modulus of elasticity
   d. Energy

2. On the basis of dimensional equation, the maximum number of unknown that can be found, is
   a. 1
   b. 2
   c. 3
   d. 4

3. Maximum number of electrons in a subshell with $l = 3$ and $n = 4$ is
   a. 10
   b. 12
   c. 14
   d. 16

4. The correct set of four quantum numbers for the valence electron of rubidium atom
   a. 5,0,0,+1/2
   b. 5,1,0,+1/2
   c. 5,1,1,+1/2
   d. 6,0,0,+1/2

5. Radiation that does not change its direction in magnetic field is
   a. α rays
   b. β rays
   c. Gamma rays
   d. X rays

6. Number of protons in an atom determine
   a. Chemical properties
   b. Physical properties
   c. Magnetic properties
   d. Electrical properties

7. In allene (C_3H_4), the type(s) of hybridisation of the carbon atoms is
   a. sp and sp^3
   b. sp and sp^2
   c. only sp^2
   d. Sp^2 and sp^3

8. Electrons should be filled in energy sub shells in order of increasing energy values is principle of
   a. Aufbau
   b. Pauli's exclusion
   c. Hund's
   d. none

9. In formula $2n^2$ principle quantum number cannot have value of
   a. 1
   b. 3
   c. 2
   d. 0

10. N+l value of 6p orbital is
    a. 5
    b. 3
    c. 7
    d. 8

11. The half life period of a radioactive isotope is 10 days how long will it take for its activity to reduce to $1/8^{th}$ of its original value
    a. 40 days
    b. 20 days
    c. 1.25 days
    d. 30 days

12. **when osmotic pressure and temperature are the same then:**
    a. Equal volume of solutions would contain equal number of moles of the solute.
    b. Equal volume of solutions would contain non-equal number of moles of the solute.
    c. Non-equal volume of solutions would contain equal number of moles of the solute.
    d. Non-equal volume of solutions would contain non-equal number of moles of the solute.

13. **The phenomenon of lowering of vapour pressure is defined as:**
    a. Decrease in vapour pressure of a solvent on addition of a volatile non electrolyte solute in it.
    b. Decrease in vapour pressure of a solvent on addition of a non-volatile non electrolyte solute in it.
    c. Decrease in vapour pressure of a solvent on addition of a volatile electrolyte solute in it.
    d. decrease in vapour pressure of a solvent on addition of a non-volatile solute in it.

14. **Which one of the following is not a colligative property?**
    a. Osmotic pressure.
    b. Elevation of boiling point.
    c. Freezing point.
    d. Depression in freezing point.

15. **Molarity of a solution is expressed as**
    a. The number of moles of a solute present in one litre of the solution.
    b. The number of moles of a solute present in 1000 gm of the solvent.
    c. The number of gram equivalent of solute present in one litre of solution.
    d. The ratio of the number of moles of solute to the total number of moles of solute.

16. Which chaperone protein plays important role in protein folding
    a. Hsp 35
    b. Hsp50
    c. Hsp 60
    d. Hsp 90

17. In which state is a protein biologically active
    a. Linear state
    b. Alpha Helix form
    c. Quartenary form
    d. Tertiary or 3D form

18. What is the diameter of Z Dna
    a. 12 Å
    b. 18 Å
    c. 20 Å
    d. 18.5 Å

19. What are the purines?
    a. A, G
    b. A, T
    c. C, G
    d. C,T

20. Which acid is present in DNA
    a. Sulfuric acid
    b. Hydrochloric acid
    c. Phosphoric acid
    d. Acetic acid

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Serial no. of the main Answer sheet

Course : .....

Semester : ..... **Roll No :** .....

Enrollment No : ..... **Course code :** .....

Course Title : .....

Session : 2017-18 **Date :** .....

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Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

Scrutinizer's Signature *Examiner's Signature* *Invigilator's Signature*