



# UNIVERSITY OF THE PUNJAB

**B.S. 4 Years Program / Eighth Semester – 2020**

Paper: Physical Chemistry (Sp. Theory-I)

Course Code: CHEM-422 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.: .....

**ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.**

**Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

**Q.1. Encircle the correct option.**

**(10x1=10)**

- i. Most commonly used moderator in nuclear reactors is
  - a) Ordinary water
  - b) Heavy water
  - c) Graphite water
  - d) Helium
- ii. Just \_\_\_\_\_ naturally occurring elements are considered stable.
  - a) 274
  - b) 284
  - c) 294
  - d) 264
- iii. Osmotic pressure can be measured by an instrument \_\_\_\_\_.
  - a) Monometers
  - b) Osmometer
  - c) Nanometer
  - d) Barometer
- iv. The Vant Hoff's equation for n moles of solute dissolved in V liters of solution is:
  - a)  $=nRT$
  - b)  $V=nRT$
  - c)  $P=nRT$
  - d)  $P=nRV$
- v. \_\_\_\_\_ nuclei are least stable.
  - a) Even-even
  - b) Odd-odd
  - c) Even-odd
  - d) Odd-even
- vi. Which one is fluorescent Emulsion?
  - a) o/w
  - b) w/o
  - c) w/o/w
  - d) All of these
- vii. \_\_\_\_\_ is unit of radiation that is used to measure biological damage.
  - a) Pascal
  - b) Roentgen
  - c) Radion
  - d) Nucleon
- viii. Hydrophilic region of surfactant molecule is called
  - a) Corona
  - b) Core
  - c) Corone
  - d) All a, b, c
- ix. Osmotic pressure of solution of given concentration is directly proportional to \_\_\_\_\_.
  - a) Room temperature
  - b) Absolute temperature
  - c) Critical temperature
  - d) Atmospheric temperature
- x. Most efficient moderator used in nuclear reactor is
  - a) Helium
  - b) Graphite
  - c) Heavy Water
  - d) Ordinary water



**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

**Q.2. Answer the following short questions. (10x2=20)**

- i. What is meant by Reverse osmosis?
- ii. What is function of Moderator in nuclear reactor?
- iii. Define Fajans-Sodyd-Russel displacement law with examples.
- iv. State Charles-Van't Hoff's law of osmosis for solution.
- v. What is CMC?
- vi. Classify emulsions on the basis of Emulsifier.
- vii. What are units of radiation Exposure?
- viii. Define Thixotrophy.
- ix. Write three research applications of tracers in chemistry.
- x. How can you differentiate oil in water & water in oil emulsion?

**Answer the following questions. (3x10=30)**

**Q.3.**

- a) State laws of osmotic pressure. (06)
- b) A solution of cane sugar (mol.mass=342g) with density of 34.2g/L has an osmotic pressure of 2.4 atm at 200C. Calculate value of R in Liter-atmosphere. (04)

**Q.4.**

- a) Differentiate b/w emulsions & Gels. (07)
- b) Explain orientation wedge theory of emulsion. (03)

**Q.5.**

- a) Write a detail note on Nuclear reactor. (07)
- b) A solution Glycol containing 1.821 g/L has an osmotic pressure of 51.8 cm of mercury at 10°C. What is molecular mass of glycol? (03)