


Knowledge Resource & Relay Centre (KRRC)

AIKTC/KRRC/SoP/ACKN/QUES/2019-20/

Date: _____

School: SoP-CBSGSBranch: SoPSEM: I

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following Semester/Periodic question papers from your exam cell:

| Sr. No. | Subject Name | Subject Code | Format | | No. of Copies |
|---------|-----------------------|--------------|--------|----|---------------|
| | | | SC | HC | |
| 1 | Physical Org. Chem. | | | - | - |
| 2 | Physical Pharmacy - I | | | ✓ | 02 |
| 3 | APP - I | | | - | - |
| 4 | Environmental Sci. | | | - | - |
| 5 | Communication Skill | | | - | - |
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Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

(3 Hours)

(Total Marks : 70)

Please check whether you have got the right question paper.

- N.B. : 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.

1. a) Short note on – Supercritical Fluid state. (03)
b) Explain principle of Polarimeter with diagram. (02)
c) 12.5 gm solute in 170gm water elevates the boiling point by 0.63K. Find its mol.wt. if $K_b = 0.52K/m$. (03)
d) Define thermodynamics and give it's applications and limitations. Classify various thermodynamic systems. (04)
e) Discuss the variation of equivalent conductance with dilution. (03)
2. (a) Explain any one method of liquefaction of gases. (04)
- OR
- (a) Define critical constants. Explain the principle and working of Aerosol. (04)
(b) Explain polarizability and dipole moment. (03)
(c) State and explain Kirchoff's equation. Write a short note on bond energy. (04)
3. (a) State and explain Rault's law. Explain it's deviations. (04)
(b) Explain efficiency of heat engine. An engine operating between $150^{\circ}C$ and $25^{\circ}C$ takes 500J from high temperature reservoir. Calculate the work done by it assuming that there are no frictional losses. (04)
- OR
- (b) Give different statements of second law of thermodynamics'. What is entropy? Explain it's importance. (04)
(c) The resistance of 0.01N electrolyte solution was found to be 210 ohm at $25^{\circ}C$. Calculate equivalent conductance of the solution if cell constant is 0.88. (03)
4. (a) Derive Vander wall's equation. (04)
(b) Explain principle and working of Abbe's refractometer. (03)
(c) Describe a method to determine elevation in boiling point of a non-volatile solute in solution. (04)
- OR
- Give any one method for determination of molecular weight.
5. (a) Differentiate between crystalline and amorphous solids. Explain concept of solvates and hydrates. (04)
(b) What is osmosis? Describe in brief modern osmometer. (04)
(c) Write a short note on Hess's law of constant heat summation. (03)
- OR
- (c) Define the following: (03)
i. Heat of formation
ii. Heat of combustion
iii. Heat of solution

6. (a) Calculate the pressure of 0.5 mole of CO_2 gas in a container of 1 liter capacity at 27°C using the ideal gas equation and Van der waal's equation. (03)
 $a = 3.608 \text{ liter}^2 \text{ atm/ mole}^2$
 $b = 0.0428 \text{ liter / mole}$
 $R = 0.0821 \text{ liter atm/ K mole}$
- (b) Explain in brief fractional distillation. (03)
- (c) Write a short note on Gibb's free energy. (03)
- (d) Write the postulates of Arrhenius theory. (02)

