

April 2014

Seat No.

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कड - 080

CHEMISTRY PAPER - I : CH - 121
Physical & Inorganic Chemistry
(New) (12135)

P. Pages : 3

Time : Two Hours

Max. Marks : 40

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to the right indicate full marks.
6. Draw a neat diagram wherever necessary.
7. Use of logarithmic table and non programmable calculator is allowed.

1. Attempt **any eight** of the following.

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- i) According to kinetic theory of gases, there are
 - a) intermolecular attractions
 - b) molecules have considerable volumes
 - c) no intermolecular attractions
 - d) the velocity of molecules increases for each collision.
- ii) The unit of Van der Waal's constant a is
 - a) $\text{atm. L}^2 \text{mol}^{-2}$
 - b) $\text{atm. L}^2 \text{mol}^{-1}$
 - c) atm. L^2
 - d) atm
- iii) The rate of diffusion of a gas is
 - a) inversely proportional to the square root of its molecular weight
 - b) directly proportional to the square root of its molecular weight
 - c) directly proportional to its molecular weight
 - d) directly proportional to its density
- iv) The temperature at which real gases obey the ideal gas laws over a wide range of pressure is called
 - a) critical temperature
 - b) inversion temperature
 - c) reduced temperature
 - d) boyle temperature

- 2. Answer any four of the following.**

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- 3.** Answer **any two** of the following.

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- ii) Sketch (100) (110) (111) planes of simple cubic lattice. Calculate the interplanar distances.
- iii) Calculate the compressibility factor of 20 moles of methane which occupies 1.07 litre at pressure 600 atmosphere and temperature 25°C
($R = 0.082 \text{ lit. atm. k}^{-1} \text{ mol}^{-1}$)

4. Answer **any two** of the following.

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- i) Why atomic size of an element decreases in a period with increasing atomic number ?
- ii) Explain the role of NH_4Cl in qualitative analysis.
- iii) Derive Van der Waal's equation of state.

5. a) Answer **any one** of the following.

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- i) Derive kinetic gas equation.
- ii) How the following factors affect the magnitude of ionisation energy of an element ?
 - a) Size of atom.
 - b) Nuclear charge.
 - c) Screening effect.

b) State the law of constancy of interfacial angle.

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