Code No.: 10011 E Sub. Code: SMCH 63 B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023. Sixth Semester Chemistry - Core PHYSICAL CHEMISTRY - IV (For those who joined in July 2017 - 2019 only) Time: Three hours Answer ALL questions. Choose the correct answer: 1. NMR spectra is studied in (a) UV region (b) Visible region (c) Radio frequency region (d) Microwave region (e) IR (d) Raman region 5. Ostwald's dilution law is applicable to (a) Strong electrolytes only (b) Weak electrolytes only (c) Strong and weak electrolytes (d) None of the mentioned 6. Among the given pairs given below which solution pair is a buffer solution? (a) Microwave region (b) Weak electrolytes (c) IR (d) Raman region 7. Phase rule is (a) F = C - P + 2 (b) F = C + P - 2 (c) F = C - P + 1 (d) F = C + P - 2 (e) F = C - P + 2 (f) F = C + P - 2 (g) F = C - P + 2 (h) Hydriding Region (a) F = C - P + 2 (b) F = C + P - 2 (c) F = C - P + 1 (d) F = C + P - 2 (e) F = C - P + 1 (f) F = C + P - 2 (f) F = C - P + 2 (g) F = C - P + 2 (h) F = C + P - 2 (h) F = C + P	(6 pages) Reg. No.:				3	,	Rate constant increases as temperature					
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- (b) (i) Sketch the low and high resolution NMR spectrum of ethanol.
 - (ii) ¹²C does not give NMR spectra but ¹³C NMR gives. Why?
- 17. (a) Deduce the rate expression for second order reaction where both the concentration terms are same. Derive the expression for half life period of this reaction.

Or

- (b) Explain Lindemann hypothesis for unimolecular reactions.
- 18. (a) Write notes on:
 - (i) Ostwald's dilution law
 - (ii) Lewis acid-base concept.

Or

- (b) Describe various indicators used in acid base titrations.
- 19. (a) (i) Derive the Phase rule thermodynamically.
 - (ii) Derive the distribution law thermodynamically.

Or

- (b) (i) State the distribution law.
 - (ii) What are the applications of distribution law?

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- 20. (a) (i) Explain about carbon nanotubes.
 - (ii) Explain the electrical properties of nanosized compounds.

Or

- (b) (i) Applications of nanoscience.
 - (ii) Magnetic properties of nanosized compounds.

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