

B.Sc. Semester - 3 (CBCS) Examination
Oct/Nov - 2024 (As Per Syllabus Year June-2017)
CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

- All questions are compulsory.
- Figures to the right indicate marks.

Que.1(A) Answer the following question. (04)

- (1) Write any three postulates of Wave mechanics.

Que.1(B) Answer any two questions out of three questions. (10)

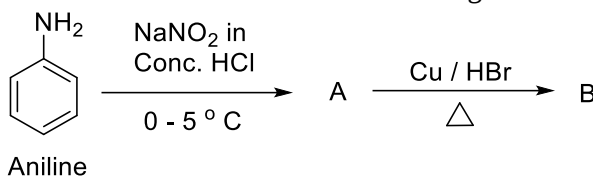
- (1) Prove that, $\Psi = \sqrt{\frac{2}{a}} \sin \frac{\pi}{a} x$ is normalized wave function.
 (where, $a = \text{constant}$ & $0 < x < a$)
- (2) Derive the co-efficient of wave function & bond angle for sp -hybridization.
- (3) Give any five differences between BMO & ABMO.

Que.2(A) Answer the following question. (04)

- (1) Discuss the Benzyne mechanism for Aromatic Nucleophilic Substitution of aryl halides.

Que.2(B) Answer any two questions out of three questions. (10)

- (1)
- Explain: Misch metal & it's uses.
 - Give structure & name of A and B for following reaction.



- (2) Explain the colour properties of Lanthanides in detail.
- (3) Give any seven uses of Lanthanides.

Que.3(A) Answer the following question. (04)

- (1) Explain preparation of 1° , 2° , 3° alcohols by using Grignard reagent.

Que.3(B) Answer any two questions out of three questions. (10)

- (1) Explain preparation of primary amines from nitro compounds in detail.
- (2) Give complete reactions of phenol with following reagents.....
 (A) Con. HNO_3 (B) Br_2 in CS_2 at 273 K (C) H_2SO_4 at 15-20 °C
- (3) Explain the method of separation of 1° , 2° , 3° amines by Hinsberg's reagent.

Que.4(A) Answer the following question. (04)

- (1) Explain: Water system with phase diagram.

Que.4(B) Answer any two questions out of three questions. (10)

- (1) Explain Kolbe-Schmidt reaction with detailed mechanism & applications.
- (2) Explain: Sulphur system with phase diagram.
- (3) Define: (i) Phase (ii) Component (iii) Degree of freedom
 (iv) Triple point (v) Eutectic point

Que.5(A) Answer the following question. (04)

- (1) Define: Azeotropic mixture & explain it's types.

Que.5(B) Answer any two questions out of three questions. (10)

- (1) Derive the modified Nernst distribution law with case study.
- (2) Explain: Henry's Law with limitations.
- (3) Write a short note on steam distillation.
