

2022

3rd Semester Examination

ZOOLOGY (Honours)

Paper : C 5-T

(Chordates)

[CBCS]

Full Marks : 40

Time : Two Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any *five* questions : 2×5=10
- (i) What is cranial kinesis?
 - (ii) Differentiate holobranch and hemibranch gill?
 - ✓(iii) Differentiate Metatheria and Eutheria.
 - ✓(iv) Write the name of endemic fish and mammal of Oriental realm.
 - (v) What is Preen gland and rhamphotheca?
 - ✓(vi) What is echinoderm theory of origin of chordates?
 - ✓(vii) What is endostyle?
 - ✓(viii) Write the diagnostic characters of cyclostomata.

P.T.O.

(2)

2. Answer any *four* questions :

5×4=20

- ✓ (i) "Archaeopteryx-a connecting link" — Justify the comment.
- ✓ (ii) Discuss the distribution of vertebrates in Australasian realm.
- ✓ (iii) Describe the biting mechanism of poisonous snake.
- (iv) Write a note on adaptive radiation in mammals based on locomotory appendages.
- ✓ (v) Write a note on fish migration.
- (vi) Differentiate echolocation between bat and whale.

3. Answer any *one* question :

10×1=10

- ✓ (i) Discuss the process of metamorphosis in Amphibia. Explain how is amphibian metamorphosis different from that of Ascidian metamorphosis. 7+3=10
- (ii) Briefly discuss the parental care of fishes. What is calamus and rachis? 7+1.5+1.5=10

Total Pages : 2

B.Sc./3rd Sem (H)/ZOO/22(CBCS)

2022

3rd Semester Examination

ZOOLOGY (Honours)

Paper : C 6-T

(Animal Physiology : Controlling and
Coordinating System)

[CBCS]

Full Marks : 40

Time : Two Hours

The figures in the margin indicate full marks.

*Candidates are required to give their answers
in their own words as far as practicable.*

1. Answer any *five* questions ; 2×5=10

(a) What do you mean reflex action?

(b) What is thermoglobulin? State its function.

(c) Name two principal nuclei of hypothalamus which are responsible for secretion of ADH and oxytocin hormone.

(d) What is Grave's disease?

(e) Where from human chironic gonadotropin is secreted? Mention its biological importance. 1+1

(f) Differentiate between preservative and fixative.

(2)

✓(g) What Corpus luteum? Mention its function. 1+1

(h) What is thin?

2. Answer any *four* questions : 5×4=20

✓(a) Briefly describe the uterine changes during menstrual cycle.

✓(b) Briefly describe how insulin hormone reduces the blood glucose level.

(c) Briefly describe how lipid soluble hormones work with diagram.

✓(d) Write a note on the cell types of anterior pituitary gland.

✓(e) What is sarcomere? Define 'A' band & 'I' band. 2+3

✓(f) Describe the mechanism of nerve impulse transmission through synapse.

3. Answer any *one* question : 10×1=10

✓(a) (i) Write the function of osteoblast and osteoclast cells.

(ii) Write a note on aldosterone escape. 4+6

(b) Describe the molecular and chemical basis of muscle contraction. 10

Total Pages : 3

B.Sc./3rd Sem (H)/ZOO/22(CBCS)

2022

3rd Semester Examination

ZOOLOGY (Honours)

Paper : C 7-T

(Fundamentals of Biochemistry)

[CBCS]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

1. Answer any *five* questions from following : $2 \times 5 = 10$

- ✓(a) What is isoelectric pH?
- ✓(b) Name the sugars that are present in DNA and RNA. Which RNA serves as template for protein synthesis?
- ✓(c) What is Z-form of DNA? How does it differ from B-form?
- ✓(d) Name one aromatic amino acid and one positively charged amino acid.
- (e) Name the electron donors of oxidative phosphorylation process.

P.T.O.

(f) Explain why a single stranded nucleic acid molecule will be more efficient in absorbing UV radiation at 260nm than a double stranded molecule at the same UV wavelength.

✓(g) Where does β -oxidation of fatty acids occur? What is ketogenesis?

(h) What is Chargaff's rule? For a given double stranded molecule write the correct equation from below.

$$\frac{A + T}{G + C} = 1 \quad \square \quad \frac{A + G}{T + C} = 1 \quad \square \quad \frac{A + G}{T + C} \neq 1 \quad \square$$

2. Answer any *four* questions from following : $5 \times 4 = 20$

✓(a) What is gluconeogenesis? Mention the key steps and regulations of gluconeogenesis pathway.

1+4=5

(b) What is transition state of an enzyme-catalyzed reaction? What is free energy of activation? Name the major forces that reduce the free energy of activation in an enzyme-catalyzed reaction?

2+2+1=5

(c) What is proton motive force? How is this force generated? How is this force used to drive ATP synthesis?

1+2+2=5

✓(d) Briefly describe the reactions of the investment phase of glycolysis mentioning enzymes involved.

✓(e) Mention and briefly describe different levels of protein structure. What are the structural motifs that play crucial role in shaping secondary structure of proteins?
4+1=5

✓(f) Write short notes on :

✓• Allosteric enzymes.

• Feedback inhibition.

2½+2½=5

3. Answer any *one* question from following : 10×1=10

✓(a) Why β -oxidation is called so? Briefly describe the steps of β -oxidation process with schematic reactions of each step. How many molecules of ATP can be generated after complete oxidation of palmitic acid?
1+7+2=10

(b) What is urea cycle and where does it occur? Briefly describe the steps of urea cycle with enzymes involved in the step.
2+8=10

Total Pages : 6

B.Sc/3rd Sem (H)/CHEM/22(CBCS)

2022

3rd Semester Examination

CHEMISTRY (Honours)

Paper : GE 3-T

[Chemical Energetics, Equilibria,
Organic Chemistry - II]

(CBCS)

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *five* questions. $2 \times 5 = 10$

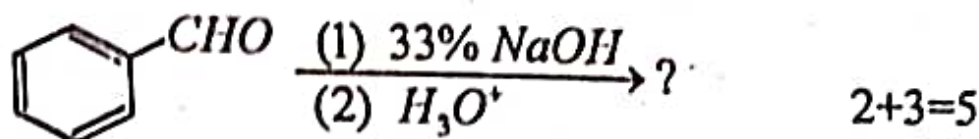
- ✓ 1. What do you mean by adiabatic flame temperature?
- ✓ 2. How benzene can be prepared from acetylene?
- ✓ 3. Differentiate primary, secondary and tertiary alcohols.
- ✓ 4. State and explain the laws of thermochemistry.
5. What is buffer capacity? In what condition this value becomes maximum?

P.T.O.

✓(b) Derive the expression of $C_p - C_v$ from thermodynamics. 3+2=5

13. (a) Define "solubility product".

(b) Write the product with mechanism.



14. (a) What is inversion temperature?

(b) What is meant by Ipso substitution? 2+3=5

Group - C

Answer any *one* question. 10×1=10

15. ✓(a) Write a short note on (any *two*): (2½×2)+5=10

(i) Friedel-Craft's alkylation

(ii) Pinacol-pinacolone rearrangement

(iii) Wolff-Kishner reduction

✓(b) Prove that for the adiabatic ideal gas $PV^\gamma = \text{Constant}$. (2.5×2)+5=10

16. (a) Calculate the pH of 1 lt. 0.2 mole NH_4Cl and 0.1 mole NH_4OH buffer solution.

(b) Write the Le-Chatelier's principal.

(c) Write short note on Wittig reaction. 6+1+3=10

P.T.O.

(2)

- ✓6. Write the mechanism of nitration of benzene.
7. At 25°C temperature calculate the pH of $10^{-8}(M)$ $NaOH$ solution.
8. Write a short note on Fries rearrangement.

Group - B

Answer any *four* questions. $5 \times 4 = 20$

9. (a) At 0°C temperature 18gm ice transferred into steam at 100°C. Calculate the change of entropy. ($L_f = 80 \text{ cal g}^{-1}$, $L_v = 540 \text{ cal g}^{-1}$).
- (b) Synthesize *n*-propylbenzene from benzene. $3+2=5$
- ✓10. (a) Write the conditions for a reaction to be spontaneous.
- ✓(b) How do you synthesize 1°, 2° and 3° alcohol by using Grignard reagent? $2+3=5$
11. (a) What happens when potassium chloride solution is added to a saturated lead chloride solution?
- ✓(b) How do you synthesize phenol from Cumene? $3+2=5$
12. (a) $\frac{1}{2}N_2(g) + \frac{3}{2}H_2(g) = 2NH_3(g)$
- In which temperature k_p and k_c value of this reaction will be equal?

Total Pages : 8

B.Sc./3rd Sem (H/ZOO/22(CBCS)

2022

3rd Semester Examination
ZOOLOGY (Honours)

Paper : SEC 1-T

[CBCS]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

(Apiculture)

Group - A

Answer any *five* questions from the following :

2×5=10

- ✓1. Write the scientific name of two commercial honey bee species.
- ✓2. What is bee wax? Write the uses of bee wax.
3. What do you mean by bee hive?
- ✓4. Write down the difference between queen and worker bee.
- ✓5. Define swarm. State its significance.
- ✓6. What is propolis? Write down the uses of propolis.
7. Write the causative agent and symptoms of stone brood disease.

P.T.O.

8. What do you mean by little bee? Write the morphological features of little bee.

Group - B

Answer any *four* questions from the following :

5×4=20

- ✓1. Write down the chemical components of honey. Mention its significance. 3+2=5
2. Write the name, nature of damage and control methods of natural enemies of honey bee. 5
3. Write short notes on : 2.5+2.5=5
(a) Wagtail Dance, (b) Bee Pasturage.
- ✓4. Describe briefly major bee keeping equipments. Write down the modern extraction methods of honey. 2+3=5
- ✓5. What do you mean by nuptial flight of honey bee? State its significance. What is honey flow period? 2+1+2=5
- ✓6. Define apiary. Write down the social behaviour of honey bee. 2+3=5

Group - C

Answer any *one* question from the following :

10×1=10

1. (a) Describe the structure of Langstroth box for rearing of honey bee.
- (b) What is movable frame hive? Write down its advantages and disadvantages. 6+2+2=10
2. (a) Write down the names, symptoms and control measures of diseases caused by virus, protozoa & bacteria in honey bee.

(b) What is apitoxin?

(c) What is royal jelly?

6+2+2=10

বঙ্গানুবাদ

বিভাগ - ক

যেকোনো পাঁচটি প্রশ্নের উত্তর দাও : $2 \times 5 = 10$

- ১। যেকোনো দুটো বাণিজ্যিক মধু মৌমাছির বিজ্ঞানসম্মত নাম লেখ।
- ২। মৌ মোম কি? এটির ব্যবহার লেখ।
- ৩। মৌচাক বলতে কি বোঝ?
- ৪। রানি মৌমাছি ও শ্রমিক মৌমাছির পার্থক্য লেখ।
- ৫। মৌঝাঁক কি? এর গুরুত্ব উল্লেখ কর।
- ৬। প্রোপোলিস কি? এটির ব্যবহার লেখ।
- ৭। Stone brood disease রোগের কারণ ও লক্ষণগুলো উল্লেখ কর।
- ৮। ক্ষুদ্র মৌমাছি কি? এটির বাহ্যিক বৈশিষ্ট্যগুলি লেখ।

বিভাগ - খ

যেকোনো চারটি প্রশ্নের উত্তর দাও : $5 \times 4 = 20$

- ১। মধুর রাসায়নিক উপাদানগুলি লেখ। মধুর গুরুত্ব উল্লেখ কর।

৩+২=৫

P.T.O.