

UG Odd Semester (CBCS) Exam., December—2016

B.Sc (Honours) B.Ed

(1st Semester)

Course No. : BSED-102

Full Marks : 50

Pass Marks : 20

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

Candidates are to answer *either* BSCH-102 *or*
BSPH-102 *or* BSZH-102

CHEMISTRY

(Honours)

Course No. : BSCH-102

1. (a) What is diagonal relationship? Explain the reasons for this phenomena. 5
- (b) Why are 4s orbitals filled before 3d orbitals? Explain on the basis of the concept of effective nuclear charge. 5

OR

2. (a) Outline the major postulates of Bohr's atomic model. 5

- (b) Derive the general formula to calculate the radii of orbits in hydrogen atom. 5

3. (a) Differentiate between the nano- and bulk-properties of materials. 4

- (b) Elaborate the sol-gel process for synthesis of nanomaterials with the help of a diagram. 6

OR

4. (a) Write notes on nanotubes and nano-wires. 4

- (b) What do you mean by top-down approach in synthesis of nano-materials? Explain any one type of such methods in detail. 2+4=6

5. (a) Write a note on catalytic oxidation and chemical oxidation of alkanes with suitable examples. 2½+2½=5

- (b) Explain Freund's method for preparation of cycloalkanes. 5

OR

6. (a) Write the mechanism of Friedel-Crafts alkylation reaction. 4

(5)

PHYSICS

(Honours)

Course No. : BSPH-102

(Mechanics and General Properties of Matters)

1. (a) What is Lorentz transformation equation of coordinates? 5
(b) Explain fictitious forces. 5
- OR**
2. (a) Discuss the general and special theory of relativity. 5
(b) What is conservative force? 5
3. (a) Explain the principle of conservation of angular momentum of a system of rotating body. 5
(b) Find out the expression for velocities of two bodies after elastic collision. 5
- OR**
4. (a) Explain the theorems of moment of inertia. 5
(b) Calculate the moment of inertia of a cylinder passing through centre. 5

J7/621

(Turn Over)

(6)

5. (a) What is gravitational intensity? 5
(b) Calculate gravitational intensity due to thin spherical shell. 5

OR

6. (a) Explain bar pendulum. 5
(b) Find out the acceleration due to gravity with the help of bar pendulum. 5
7. (a) Find out the relationship among elastic constants. 5
(b) What is torsional pendulum? 5

OR

8. (a) What is viscosity of fluid? 5
(b) Find out viscosity of a liquid by Poiseuille's method. 5
9. (a) What is the importance of nanoscale and nanotechnology? 5
(b) Explain the objective of nanotechnology. 5

OR

10. (a) What is nanophysics? 5
(b) Write a short note on nanoparticles. 5

J7/621

(Continued)

(7)

ZOOLOGY
(Honours)

Course No. : BSZH-102

(Taxonomy and Chordates)

1. (a) Establish a relationship between systematics and taxonomy. 4
- (b) What is meant by International Code of Zoological Nomenclature (ICZN)? Mention the rules of nomenclature as prescribed by ICZN. 2+4=6
- OR**
2. (a) Write a note on Linnaean hierarchy. 3
- (b) Illustrate the newer trends followed in systematics for classifying organisms. 7
3. (a) Classify Chordata up to class with examples. 5
- (b) Write down the primitive and specialized characters of *Amphioxus*. 5
- OR**
4. (a) Give an account of the digestive system of *Petromyzon*. How does it differ from Ammocoete larva? 3+3=6

J7/621

(Turn Over)

(8)

- (b) Enlist the salient features of class Cyclostomata. 4
5. (a) Describe the external morphological features of *Scoliodon*. 5
- (b) Analyze the affinity exhibited by Dipnoi towards other closely related organisms. 5
- OR**
6. (a) Depict the functions of air bladder in fishes. 6
- (b) Mention the characters of all the amphibian orders along with examples. 4
7. (a) Distinguish between poisonous and non-poisonous snakes. 5
- (b) Enlist the salient characteristics of class Reptilia. 5
- OR**
8. (a) Write down the salient features of class Aves. 4
- (b) Describe different types of air sacs present in birds with the help of labelled diagram. 6

J7/621

(Continued)

(9)

9. (a) Explain the digestive system of any mammal. 5
- (b) Demonstrate the ways or methods of parental care shown by the amphibians. 5

OR

10. (a) Briefly outline the general characters of *Sphenodon*. 5
- (b) Write a note on affinity of *Sphenodon* with other related groups of animals. 5

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