B.Sc. 4th Semester (New Scheme) Examination,

April–2018

BIO TECHNOLOGY

Paper-BT-406

Organic Chemistry

Time allowed : 3 hours] *[Maximum marks : 40*

Note : *Attempt* ***five*** *questions in all, selecting* ***one*** *question from each section.* ***Question No. 1 is compulsory.***

1. (a) Give IUPAC name of Dimethyl amine.

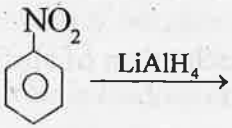
   (b) Define fundamental vibrations.

   (c) CH_3–OH is good solvent for U.V. not for I.R. spectroscopy. Why ?

   (d) Why does sulpha nitric acid exist as Zwitterion ?

   (e) Why aromatic diazonium salts are more stable than aliphatic diazonium salts ?

   (f) Complete the reaction.



   (g) What is Corey's reagent ?

   (h) Give one example of cross aldol condensation.

1×8=8

Section–A

2. (a) Discuss the effect of inter and intra-molecular H-bonding on absorption frequency in IR Spectroscopy. 3

(b) Explain molecular vibrations. 3

(c) What are important absorption region in IR spectra of :

(i) Isopropyl alcohol 2

(ii) Toluene

3. (a) A compound C_3H_6O gives two peaks at 1718 cm^{-1} and 3000–2500 cm^{-1}. Deduce possible structure. 2

(b) Write note on : 6

(i) Finger print region

(ii) Hooke's Law

(iii) Fermi resonance

Section–B

4. (a) Explain the mechanism of Hofmaan bromamide reaction. 3

(b) What factors effects basicity of aromatic amines ? Explain with examples. 3

(c) What is ortho effect ? 2

5. (a) Describe the reactions of 1^{o},2^{o} & 3^{o} anines with nitrous acid. 3

(b) Complete the reactions : 3

(i) $C_6H_5-CHO \xrightarrow{O} X \xrightarrow{NH_3} Y \xrightarrow[Br_2]{KoH} Z$

(ii) $C_6H_5-CN \xrightarrow[H^+]{KoH} X \xrightarrow[\Delta]{NH_3} Y \xrightarrow[Br_2]{KoH} Z$

(c) Write short note on cabriel phthalimide reaction. 2

Section–C

6. (a) Explain the mechanism of diazotization ? What if $-NO_2$ group is present in benzene ring ? 3

(b) Convert p-Toluidine into :

(i) 3-Bromotoluene

(ii) 3,5-Dibromo-toluene 3

(c) What is role of pH during coupling reactions of phenol & benzene diazonium chloride. 2

7. (a) Explain Reduction of nitroalkanes in acidic, basic and neutral medium. 3

(b) Aliphale hydro carbons do not undergo nitration easily. 3

(c) Arrange the following in decreasing order of acidity : 2

(i) CH_3-NO_2

(ii) $CH_3-CH_2-NO_2$

(iii) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-NO_2$

Section–D

8. (a) What are different oxidizing agents used to oxidize alcohols ? 3

(b) Give mechanism of Claisen reaction. 3

(c) Explain the acidity of α-hydrogen atom of carbonyl compounds. 2

9. (a) Compare the reduction of carbonyl compounds through Clmmensens reduction and Wolff Kishner reduction. 4

(b) Discuss mechanism of : 4

(i) Mannich reaction

(ii) Cannizzaro reaction.

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B.Sc. 4th Semester (New Scheme) Examination,

April–2018

BIO TECHNOLOGY

Paper-BT-407

Inorganic Chemistry

Time allowed : 3 hours] *[Maximum marks : 40*

Note : *Attempt* ***five*** *questions in all, selecting* ***one*** *question from each section.* ***Question No. 1 is compulsory.***

1. (a) Out of La(57) and Sm(62), which element will give coloured ion ?

(b) Complete the reaction :

$$_{92}U^{239} \rightarrow \text{——} + {}_{-1}e^{0}$$

(c) What are transuranic elements ?

(d) Why $La(OH)_3$ is more basic than $Lu(OH)_3$?

(e) Which colour is obtained when ferric chloride reacts with pot. sulfocyanide ?

(f) Which radicals are present in Group IV.

(g) Write equation when sodium thiosulphate reacts with iodine solution.

(h) What do you understand by digestion of precipitates ? $1\times8=8$

Section–A

2. (a) Discuss the method of separation of Lanthanides. 4

(b) Compare :

(i) Oxidation states

(ii) Complex formation properties of d-block elements with those of f-block elements. 4

3. (a) Write four points of differences between Lanthanides & actinides. 4

(b) What is Lanthanide contraction ? Discuss the causes and effects of Lanthanide contraction. 4

Section–B

4. (a) Actinides form oxocatios but Lanthanides do not. Why ? 2

(b) Write short note on : 2×3=6

(i) Colour of ions

(ii) Magnetic behaviour of Actinides

(iii) Size of actinides

5. (a) The electronic configuration and position of most of the actinides is controversial. Comment. 4

(b) What is nuclear fusion ? Give two reactions to explain. 2

(c) What are similarities between Lanthanides & actinides ? 2

Section–C

6. (a) What are interfering radicals ? How they interfere ? Discuss the chemistry of removal of oxalate ions from mixture. 6

(b) Explain the chemistry of ring test for NO_3^- ion. 2

7. (a) Explain :

(i) How carbonate is detected in presence of SO_3^{2-} (Sulphite) during inorganic analysis. 6

(ii) How is nitrate confirmed in presence of Bromide ?

(b) Discus the silver nitrate test for thiosulphate. 2

Section–D

8. (a) How are these reagents used for detection of cation in qualitative analysis : 2×3=6

(i) Sodium cobaltinitrite

(ii) DMG

(iii) Nessler's reagent

(b) Why Group II radicals are precipitated by passing H_2S gas only in acidic medium. 2

9. (a) Write short note on : 4

(i) Co-precipitation

(ii) Post precipitation

(b) Why does Zn^{2+} not precipitate with Cd^{2+} ions in group II ? 2

(c) Explain Lake Test for *Al*. 2

94109

B.Sc. 6th Semester Examination,

April–2019

BOTANY

Paper–P-1 6.1

Biochemistry and Plant Biotechnology

Time allowed : 3 hours] *[Maximum marks : 40*

Note : ***Q. No. 1 is compulsory.*** *Attempt* ***four*** *more questions selecting* ***one*** *question from each unit.*

नोट : *प्रश्न सं. 1 अनिवार्य है। प्रत्येक इकाई से* ***एक*** *प्रश्न का चयन करते हुए* ***चार*** *प्रश्न और कीजिए।*

1. Define following : 1×8=8

(i) Michaelis-Menten constant

(ii) Respiratory fuel

(iii) Glyoxysomes

(iv) Nitrogenase

(v) Transamination

(vi) Marker genes

(vii) Suspension culture

(viii) Totipotency

निम्नलिखित को परिभाषित कीजिए : 1×8=8

(i) माइकलिस मेंटेन नियतांक

(ii) श्वसन ईंधन

(iii) ग्लाइऑक्सीसोम्स

(iv) नाइट्रोजिनेज़

(v) ट्रांसएमाइनेशन

(vi) मार्कर जीन्स

(vii) निलम्बन संवर्ध

(viii) टोटिपोटेंसी

Unit–I

इकाई–I

2. Write note on :

(i) Conjugate enzymes 2

(ii) Feed back inhibition 2

(iii) Lock and key mechanism of enzyme action 4

टिप्पणियां लिखिए :

(i) संयुग्मी एन्ज़ाइम्स 2

(ii) प्रतिपुष्टि निरोध 2

(iii) एन्ज़ाइम क्रिया की ताला और चाबी कार्यप्रणाली 4

3. What are enzymes ? Give the essential properties of Enzymes. 8

एन्ज़ाइम्स क्या हैं ? एन्ज़ाइम्स के आवश्यक गुणों को बताइए। 8

Unit–II

इकाई–II

4. Define RQ. Discuss the variations in RQ on different respiratory fuel ? What is its significance ? 8

RQ को परिभाषित कीजिए। विभिन्न श्वसन ईंधन पर RQ में परिवर्तनों की विवेचना कीजिए। इसका क्या महत्व है ? 8

5. Write note on :

(i) Redox Potential 4

(ii) Difference between Glycolysis and Kreb cycle 4

टिप्पणी लिखिए :

(i) रेडॉक्स पोटेंशियल 4

(ii) ग्लाइकोलिसिस तथा क्रेब-चक्र के बीच अंतर 4

Unit–III

इकाई–III

6. Write note on :

(i) α-oxidation of fatty acids 4

(ii) Glyoxylate cycle 4

टिप्पणी लिखिए :

(i) वसा अम्लों का α-ऑक्सीकरण 4

(ii) ग्लाइऑक्सीलेट चक्र 4

7. Write note on :
   (i) Nitrate reductase
   (ii) Symbiotic nitrogen fixation
   (iii) Denitrification
   (iv) Saturated fatty acids. 2×4=8

   टिप्पणी लिखिए :
   (i) नाइट्रेट रिडक्टेज़
   (ii) सहजीवी नाइट्रोजन स्थिरीकरण
   (iii) अनाइट्रीकरण
   (iv) संतृप्त वसा अम्ल 2×4=8

Unit–IV

इकाई–IV

8. What is Gene cloning ? Discuss various enzymes used in Gene Cloning. 8

   जीन क्लोनिंग क्या है ? जीन क्लोनिंग में प्रयुक्त विभिन्न एन्ज़ाइमों की विवेचना कीजिए। 8

9. Write note on :
   (i) Agrobacterium mediated gene transfer 4
   (ii) Morphogenesis 2
   (iii) C DNA library 2

   टिप्पणी लिखिए :
   (i) एग्रोबैक्टीरियम अभिमध्यित जीन अंतरण 4
   (ii) आकारजनन 2
   (iii) सी डीएनए लाइब्रेरी 2

Roll No. .....

91050

B.Sc. Bio-Technology
1st Semester w.e.f. 2012-13
Examination – November, 2018

PHYSICAL CHEMISTRY

Paper : BT-105

Time : Three Hours] *[Maximum Marks : 40*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory.***

1. (a) Does mean free path depend upon the velocity of the molecule ? Justify your answer. $1 \times 8 = 8$

(b) What are the SI units of Vander Waal's constant '*a*' ?

(c) Define most probable velocity.

(d) Define compressibility factor.

(e) What is event temperature ?

(f) What is specific viscosity ?

(g) Which crystal system is isotropic and why ?

(h) What type of h, k, l planes give X-ray reflection in phase for face centred cubic lattice ?

SECTION – A

2. (a) Derive the expression $< c >= \sqrt{8RT / \pi M}$. 4, 4

(b) From expression of Maxwell's distribution of velocities, derive expression for Maxwell's distribution of energies.

3. (a) Two moles of ammonia gas are enclosed in a vessel of $5\,dm^3$ capacity at 300 K. Calculate the pressure the gas in kilopascal (kPa) assuming that : (i) gas behaves like an ideal gas (ii) the gas behaves like a real gas. 4, 4

(b) To derive the following expressions :

$$T_B = a / Rb$$

SECTION – B

4. (a) Derive the expression : $P_C V_C = (3/8) RT_C$. 4, 4

(b) Discuss the Claude's process for liquification of gases.

5. The critical temperature of carbon dioxide gas is 31.1°C and its critical density is 0.455 g/ cm^3 . Find out values of a, b and c for gas. (h = 0.082 l atm/degree/mol) 8

SECTION – C

6. (a) Explain different theories of liquid. 5, 3

(b) Write about factors affecting vapour pressure.

7. (a) Define coefficient of viscosity. Explain, how it can be measured ? 5

(b) The radius of a given capillary is 0.105 mm. A liquid whose density is 0.800 g/cc rises in this capillary to a height of 6.25 cm. Calculate the surface tension of the liquid. 3

SECTION – D

8. (a) A reflection from (iii) plane of cubic crystal was observed at a glancing angle of 11.2° when *X* ray of wavelength 154 pm were used. What is the length of the side of the unit cell ? At what angle the reflection will take place from (123) planes ? 5, 3

(sin 11.2° = 0.1944)

(b) Write about thermography.

9. (a) Explain liquid crystals & its types. 5, 3

(b) Briefly explain law of symmetry.