المستوى الثاني - مجموعة البيولوجي - مقدمة في الأنسجة العام للنبات (م ٢٠٢)

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
First Term: Dec. 2014

Educational Year: Second level | **Program (Branch): Biology Students**
Code: B 202 | **Courses: Introduction in plant metabolism**
Time: 2 hrs | **Date: 24 /12 /2014** | **Full mark: 60**

Answer the following questions: | **ملحوظة: مراعاة تسلسل الاجابة كما هو في الاسئلة**

Part I: Photosynthesis (12 marks)

Complete the following: (12 marks)

1- From the Z-Scheme, ATP produced in PHSII is known as …….. while the ATP in PHSI is described as ……
2- Photolysis leads to ……., this is shown by an equation:
…….. ⟶ ……+ ……. ⟶ ……+ …….
3- Hill reaction proves that ……..
4- The carboxylase enzyme is responsible for the reaction between …….. + ……
5- The reduction of PGA requires ……+ ……. and it is converted into ……
6- The Calvin cycle can be summarized by the following equation:
……+ …… + ……. ⟶ ……. + ……. + ……+ ……....
7- The transketolase enzyme activates the following reactions:
1- …….. + …… ⟶ …….. + ……
& 2- …….. + …… ⟶ …….. + ……
8- The transaldolase enzyme accelerate the following reaction:
…….. + …… ⟶ …….. + ……
9- The sucrose synthesis needs …… + …… and gives …… + …….

Part II: Carbohydrates (12 marks)

A- How plants send sugars from sources to sinks. (6 marks)
B- Write short notes on:
1- Direction of carbohydrates translocation. (3 marks)
2- Effect of phytohormones on carbohydrates translocation.(3 marks)

Part III: Lipids (12 marks)

A- Answer the following questions: (5 marks)
1- What two chemicals combine to form a lipid?
2- What is the **chemical** difference between a saturated and unsaturated fat?
3- A fatty acid with 14 carbon atoms will undergo how many cycles of beta oxidation?
4- **Lyso phosphatidic acid is**
a. Glycerol-3-phosphate b. 1-Acyl glycerol-3-phosphate
c. Glycerol-3-phosphate acyltransferase
5- Structural formula of triglycerides.

B- Explain only <u>two</u> from the following: (7 marks)
1- Biosynthesis of fatty acids.
2- Kennedy pathway.
3- Mention the steps for conversion of:

$$CH_3\text{-}(CH_2\text{-}CH_2)_n\text{-}CH_2\text{-}CH_2\text{-}\overset{\overset{\displaystyle O}{\|}}{C}\text{-}OH$$

To:

$$CH_3\text{-}(CH_2\text{-}CH_2)_n\text{-}\overset{\overset{\displaystyle O}{\|}}{C}\text{-}S\text{-}CoA + CH_3\text{-}\overset{\overset{\displaystyle O}{\|}}{C}\text{-}S\text{-}CoA$$

Please turn over

من فضلك اقلب الورقة

Part IV: Respiration and Amino acids & Proteins (24 marks)

(i) Respiration: (12 marks)

A- Choose the most correct answer or answers: (4 marks)

1- All these compounds are C6 molecules except .....
   a- Citrate b- Isocitrate
   c- Glucose d- Succinate

2- Break down of pyruvate into CO_2 occurs in .....
   a- Kreb's cycle b- TCA cycle
   c- Glycoloysis & TCA cycle d- Glycolysis

3- The conversion of 3-phosphoglycerate into 2-phosphoglycerate is catalyzed by an enzyme called .....
   a- Phosphoglycerate isomerase b- Phosphoglycerate mutase
   c- Phosphoglycerate dehydrogenase d- Phosphoglycerate kinase

4- For each two pairs of electrons pass through complex IV ..... are moved into the inter membrane space
   a- 4 protons b- 2 protons
   c- 2 electrons d- No protons

B- Mention the stages of anaerobic respiration and illustrate the second stage. (4 marks)

C- Match from column B the most suitable sentence for column A (4 marks)

A	B
1- F0 ATP synthase	a- Free energy
2- Proton motive force	b- Substrate level phosphrylation
3- Thioester bond	c- Movement of protons back to the matrix
4- Formation of ATP in glycolysis	d- Chemical and electrical potential energy

(ii) Amino acids and proteins: (12 marks)

A- Answer the following questions: (6 Marks)

1- Synthesis of an amino acid alanine by transamination method, referring to the structural formula. (2 Marks)
2- Discuss the initiation and termination steps in translation of protein synthesis (Draw only). (2 Marks)
3- The general equation of the oxidative deamination reaction, referring to the structural formula. (1 Mark)
4- The structural formula of glutamate-aspartate-glycine tripeptide. (1 Mark)

B- Complete the following table: (3 Marks)

	Function
DNA	
rRNA	
tRNA	
mRNA	

C- Define the followings: (3 Marks)

1- Anticodon.
2- Transcription.
3- Amides and the general formula.
4- Termination signals.

With our best wishes

Prof. Samy A. Abo-Hamed Prof. Heshmat S. Aldesuquy Prof. Waffa M. Shoukry
Dr. Rasha M. Eid Gamel Dr. Amany M. Kazamel

ن ١ - مقدمة في البيئة والتصنيف الزهري -

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
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المنصورة - مصر

Final Examination in Botany
First Term: Dec. 2014

Educational Year: Second Level — Program (Branch): Biology
Subject: Bot (201) — Course(s): Introduction to Plant Ecology & Taxonomy
Time: 2 hrs — Date: 28 /12/2014 — Full mark: 60 — Question mark: 20

Answer the following three questions:

Q1:

[A] Mark the following sentences by true (√) or false (×) (10 marks)

1) Obligatory halophytes are requiring salinity throughout their life.
2) In hydrosere succession, phytoplankton stage leads directly to reed swamp stage.
3) Drought escaping plants are short lived plants called ephemerals.
4) Evergreen forests are found in the arctic and polar regions.
5) Non-succulent xerophytes are called true xerophytes.
6) Hygroscopic water in soil is the main source of water for plants.
7) A vertical section of soil through its all horizons termed as soil profile.
8) Xerophytes are growing in saline habitats while halophytes are growing in dry habitats.
9) Amphibious hydrophytes, these plants are adapted to both aquatic and terrestrial mode of life.
10) Secondary succession starts on the extreme bare areas.

[B] Give an account on:

1) Xerosere succession (With help of diagram). **(5 marks)**
2) Transported soil parent materials. **(5 marks)**

Q2:

[A] Complete the following sentences (10 marks)

1. The main basic processes of soil development are .....[1]....,...[2].....and...[3].....
2. In evolution of vegetation, the first stage is called.....[4]....while, the final stage is called ...[5].....
3. Hydrophytes are adapted to the environment through...[6].....and...[7].....
4. The main source of soil water which available to plants is called ...[8].....
5. Floating hydrophytes may be .....[9].....and.....[10]....

[B] Compare THREE of the following pairs: (5 marks)

1. Samara and Caryopsis.
2. Siliqua and legume.
3. Male and Female flower in Palmae (Phoenix)
4. Stamens in Canaceae and stamens in Musaceae.

[C] Describe the taxonomical characters of Liliaceae. (5 marks)

Please turn the page

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First Term: Dec. 2014

Q3:

[A] Fill the space with the correct word: **(10 marks)**

1) .....is the creator of binomial nomenclature.
2) When stamens united with their filament only it may be .....or.....or.....
3) In .....placentation, the ovules are carried on a central upgrowth arising from the basal part of the ovary.
4) Contorted aestivation may be .....or.....
5) .....flowers having floral parts situated around the ovary
6) Pistil is composed of ....., ...and.....
7) .....and.....constitute the sterile leaves of the flower
8) The stamen is formed of ....., ...and .....
9) In wind-pollination, flowers have.....anthers and.....stigma
10) We can identify plants by using.....and.....

[B] **(10 marks)**

1) Mention two families related to subclass Choripetalae (Archichlamydeae) and two families related to subclass: Sympetalae (Metachlamydeae).
2) Mention three types of racemose inflorescences and two types of cymose inflorescences.
3) Give one important difference between :
   - Solanaceae and Labiatae.
   - Compositae and Umbelliferae.
   - Cruciferae and Malvaceae.

Best Wishes

Examiners:

Prof. Ibrahim Mashaly

Dr. Ehsan El-Habashy

مقدمة في البيئة والتصنيف الأول ٢٠١٤

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[B] **(10 marks)**

1) Mention two families related to subclass Choripetalae (Archichlamydeae) and two families related to subclass: Sympetalae (Metachlamydeae).
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Best Wishes

Examiners:

Prof. Ibrahim Mashaly

Dr. Ehsan El-Habashy

جيولوجيا
مجموعة البيولوجي - أسس الكيمياء العضوية ١ (ك ٢٢٥)

Mansoura University Faculty of Science Chemistry Department		First Term Time Allowed: 2 Hours Date: Jan. 2015 Full Marks : 60

Course(s): Chem.235 Principles of Organic Chemistry I for 2nd Level Microbiology, Chem. Bot., Chem. Zool., Geology, Biophysics and Environmental Science students

Answer All Questions

Q1: Complete the following equations **(20 Marks)**

a- $CH_3CH(Br)CH_2CH_3 \xrightarrow{Alc.KOH}$ -------

b- $CH_3CH_2COONa \xrightarrow{electrolysis}$ -------

c- $(CH_3)_2C{=}O \xrightarrow{PCl_5}$ -------

d- $CH_3C{\equiv}C{-}CH_3 \xrightarrow{O_3,\ Zn,\ H_2O}$ ------

e- $CH_3{\cdot}CH{=}CH{-}CHO \xrightarrow{NaBH_4}$ -------

f- $CH_3{\cdot}CH{=}CH{-}CH_3 \xrightarrow[aq.\ cold]{KMnO_4}$ -------

g- $CH_3C{\equiv}C{-}H \xrightarrow[H_2SO_4]{H_2O,\ HgSO_4}$ ------

h- $(CH_3)_2C{=}CH_2 \xrightarrow{Br_2,\ CCl_4}$ -------

i- $CH_3CH_2CH_2CH{=}O \xrightarrow{NH_2OH}$ -------

j- $C_6H_5CH_2OH \xrightarrow{PBr_3}$ -------

k- $CH_3C(Br)_2CH_3 \xrightarrow{Alc.KOH}$ -------

m- $CH_3CH(OH)CH_3 \xrightarrow[heat]{H_2SO_4}$ -------

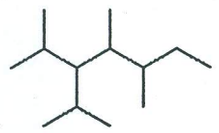
n- $CH_3{-}C{\equiv}C{-}CH_3 \xrightarrow{H_2\ /\ Ni}$ ----- $\xrightarrow{HBr}$ -------

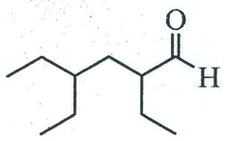
o- $C_6H_5{-}\overset{\overset{O}{\|}}{C}{-}CH_3 \xrightarrow{3\ I_2}$ ----- $\xrightarrow{NaOH,\ heat}$ -----

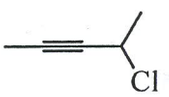
p- $C_2H_5C{\equiv}C{-}H \xrightarrow{amm.AgNO_3}$ ------ $\xrightarrow{CH_3Cl}$ ------

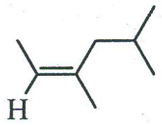
q- $(CH_3)_2\underset{\underset{Cl}{|}}{C}{-}CH(CH_3)_2 \xrightarrow{Alc.KOH}$ ------ $\xrightarrow[H_2O]{O_3,\ Zn(Hg)}$ ------

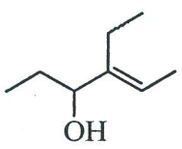
Q2: A) Give the IUPAC name for each compound. **(5 Marks)**

i - 

ii - 

iii - 

iv - 

v - 

b) Explain the followings by equations. **(15 Marks)**

i- Addition of HCl to 2-methyl-2-butene gives 2-chloro-2-methylbutane

ii- 2,3-dimethyl-2-butanol give mixture of two alkenes when heated with H_2SO_4

Please Turn to Next page

iii- Reaction of benzaldehyde with acetic anhydride in presence of CH_3COONa.

iv- Reaction of 2-methylpropene with Br_2 / H_2O

v- Treatment of acetaldehyde (2 moles) with 20% NaOH solution

A) Give product(s) of the following reactions, explain your answer with equations. (15 Marks)

i) Reaction of C_2H_5MgBr followed by H_2O with	**a)** CH_3CHO	**b)** HCHO
ii) Reaction of 50 % NaOH solution with	**a)** propanone	**b)** 2,2-dimethylpropanal
iii) Action of O_3, Zn(Hg), H_2O, on	**a)** 2-Butene	**b)** 1-butene
iv) Treatment of 2-bromopropane	**a)** Aq. NaOH	**b)** Alc. KOH
v) Action of $K_2Cr_2O_7$ / H_2SO_4 on	**a)** 2-butanol	**b)** 2-methyl-2-propanol
vi) Electrolysis of	**a)** $\begin{matrix}CH_2COOk\\ \vert\\ CH_2COOk\end{matrix}$	**b)** $\begin{matrix}CHCOOk\\ \Vert\\ CHCOOk\end{matrix}$

B) Compound **(A)** has molecular formula C_4H_8, when reacted with O_3 followed by hydrolysis gives a mixture of two products **(B)** and formaldehyde. Reduction of **(B)** give 2nd alcohol **(C).** When **(B)** reacts with methyl magnesium bromide (CH_3MgBr) followed by hydrolysis give product **(D).**

From these data, deduce the chemical structures of **A, B, C** and **D** with writing the chemical equations for the above reactions. **(5 Marks)**

With our Best Wishes

Examiners: Prof. Dr. Ahmed Fadda **Dr. Doria Saleh** **Dr. Manal El-fidawy**

Dr. Dalia Ayad **Dr. Noha Shaker**

Mansoura University
Faculty of Science
Zoology Department
Subject: Zool. (Z. 204)

First term
Date 21 /1/2015
Final Exam. Of Chordata
(Second level all programs)
Time Allowed / Two hours

Answer the following three questions Full mark (60)

Q1- Fill in the spaces with right words (20 Mark one for each space)

a- Chordates exhibit different phenomena as ---1--- in ascidia, -----2---in larvacea, ---3---- in amphibia and ---4----, ---5--- in reptilia.

b- The classes which have single ovary includes ----6---, ----7--, --8--- and while the animal which has median olfactory organ is ---9--.

c- Cephalochordates have many sense organs as -10---, --11-- and --12---.

d- Digestive system of class ---13-- and --14--- has spiral valve .

e- Filter feeding characteristic to --15--- and ----16---.

d- Excretory organs of amphioxus are --17---, of ascidia is --18-- of fishes is ---19--- and of all amnoites is --20---.

Q2- Compare the following items (20 Marks)

a- Morphological characters of chondrichthyes and osteichthyes .

b- The adult and larval stages of petromyzon.

Q3- Answer the following two items

A- Write the different characters of class aves.

B- Choose the correct answer between brackets

1- The classes which have no stomach --------

a) amphioxus only (b) petromyzon only (c) bony fishes (d) a&b

2- Median fins only characteristic to-----

(a) Amphioxus only (b) amphioxus &petromyzon (c) petromyzon & dog fish (d) bony fishes only

3- Nocturnal animals are those -----

(a) active by day (b) active by night (c) active during summer (d) active all the year

4-Swimming bladder characteristic to ----

(a) all fishes (b) all chondrichthyes (c) all bony fishes (d) some bony fishes.

5-Cervical vertebrae are present in ----

(a) all tetrapoda (b) all amniote (c) some tetrapoda (d) mammals only

6-Metanephros appeared firstly in ----

(a) Aves (b) mammals (c) reptelia (d) amphibia (a)

7- The septum between the thoracic and abdominal cavities of mammals called ----

a) Diaphragm (b) transverse septum (c) oblique septum (d) membranous septum

8- The horizontal septum separating the food passage from the air passage known as -----

(a) hard palate (b) soft palate (c) secondary palate (d) primary palate

9- Ear pinna is characteristic to class ----

(a) amphibian (b) aves (c) mammals (d) reptilian

10- Claws are structures characteristic to -----

(a) all mammals only (b) all reptilian only (c) all amniotes (d) amphibian

With best wishes

Prof. Dr. Zeinab M.A. El Gohary Dr. Fawkeia I. El Sayad

٢ فيزياء حيوي - ضوء فيزيائي ف ٢٢١
كيمياء
كيمياء حيوي + مجموعة البيولوجي

Mansoura University | **First term Exam, 11/1/2015**
Faculty of Science | **2nd level**
Physics Department | **Time allowed : 2 hours**

Full mark : 80 marks

Subject : physics | **Course : 221ف Physical optics**

Answer the following questions:

1- a) Demonstrate an explanatory diagram of the optical arrangement of Newton's rings interferometer. Drive the necessary formula of these rings. Discuss the forming of the dark spot in the center of these rings. Explain how the wavelength of the unknown monochromatic source can be measured using this interferometer.

(20 marks)

b) When a thin sheet of transparent material of thickness 6.3×10^{-4} cm is introduced in the path of one of the interfering beams, the central fringe shifts to a position occupied by the sixth bright fringe. If $\lambda = 5460$ A°, find the refractive index of the sheet.

(7 marks)

2- a) If the disturbances are produced at a given point by to coherent sources separately given by:

$$y_1 = a \sin(wt - \alpha_1) \quad \text{and} \quad y_2 = a \sin(wt - \alpha_2)$$

Deduce an expression for the intensity at a given point when both sources interfere. Sketch a plot of this intensity as a function of the phase difference $\delta = (\alpha_1 - \alpha_2)$.

(20 marks)

b) Explain a method to produce the beam of plane polarized light.

(7marks)

3- a) Give a model to discuss the intensity distribution of Fraunhofer diffraction pattern when using a rectangular slit.

(20marks)

b) What should be the total number of lines, a grating must have in order to just separate the sodium doublet ($\lambda_1 = 5896$ A°, $\lambda_2 = 5890$ A°) in the first order?

(6 marks)

With my best wishes

Prof. Dr. Taha Sokkar

Mansoura University
Faculty of Science
Zoology Department

Final Exam, Jan. 2015

Education year: Second level — Program: Biology
Time: 2 hours — Subject: Zoology
Date: 18/1/ 2015 — Course: Introduction to Embryology
Code: Z 201 — Full Mark: 60

Answer all the following questions:

Q1) A- Choose the correct answer of the following: (8) Marks

1- ……is completed when the three germ layers are occurred.
a- cleavage b- blastula c- gastrula

2- Internal fertilization is necessarily for the…….. living animals.
a- air b- water c- land

3- Acrosomal reaction occurs by ……. Glycoprotein overlies the sperm.
a- removing b- adding c- union

4-During implantation ……..cells hange the blastocyst into the uterin wall.
a- hypoblast b- trophoblast c- epiblast

5- The humane blastocyst has been implanted in the uterus while it is -----
a- covered with zona pellucida b- without zona pellucida c- not A or B

6- The secretion of prostate gland contains fibrinolysin enzyme that …..the semen.
a- liquefies b- solidifies c- neutralizes

7-The Acrosome spreads over the nucleus during …..… phase.
a- golgi b- cap c- maturation

8- The activation of SRY gene on …….. differentiates the indifferent embryonic gonads into male gonads.
a- XY chromosome b- Y chromosome c- XX chromosome

Q1)B- 1- Compare between the somatic & germ cells. (6) marks

B- 2- Fertilization steps. (6) marks

Q2) a- Write short notes on: **(14) marks**

1-The uterine cycle possesses three phases.

2 -The accessory glands of male genital system.

3- Ectopic pregnancy.

Q2) b- Identify: **(6) marks**

Spermiogenesis - fertilization - sperm capacitation - Zona reaction

Q3) A- Choose the correct answer: **(5) marks**

1- Cleavge is characterized by …….. cell cycle

A- long b- short c- not A or B

2- Dring embryogenesis, the trophoblast will form the

A- embryo proper B-chorion C- yolk sac

3- During chick development the area pellucida is separated from yolk by ……

A- blastocoel B-subgerminal cavity C-marginal zone

4- monozygotic twins must have the …….. fingerprint

A- same B- different C- not A or B

5- Hatching of human blastocyst occurs as a result of digesting zona pellucida by…….

A- E-cadherine B- hyaluronidase C- protease

Q3) B- **Compare between each of the following**: (15)marks

1- gastrula of Amphioxus and Toad

2- Monozygotic and Dizogotic twins

Mansoura University Faculty of Science Chemistry Department Subject: Inorganic Chemistry CHEM 221 (s & p-Block elemnets)		First Semester 2nd Level Chemistry-Botany Students Date: 4th Jan. 2015 Time: 2 hours Marks: 80

Answer The Following Questions

I) Comment on (7 only) of the following:- **(28 marks)**

1) The reactivity of elements of **Group IA** with water increases down the group.

2) The 1st Ionization Energy (1st IE) of ($_{12}$**Mg,** $_{15}$**P and** $_{18}$**Ar**) is high **while** for ($_{16}$**S**) is low.

3) Berylium metal is amphoteric **whereas** aqueous solutions of Be(II) salts are acidic.

4) Boron trifluoride (BF_3) is Lewis acid.

5) The size of sodium ion (Na^+) is smaller than that of sodium atom **(Na), while** that of Cl^- is larger than **Cl**.

6) In aqueous solutions, cesium ions (Cs^+) conduct electricity more than (Li^+), while the crystalline salts show decrease on the hydration.

7) Thallous (I); $_{81}Tl^+$ compounds are stable.

8) B_2O_3 shows amphoteric behaviour.

.....

II) A- Write shortly on (4 only) of the following:- **(20 marks)**

1) Separation of Aluminium metal **(Al)** from **bauxite ore** {**(AlO(OH)**}.

2) Plant fertilizers are normally containing **three main ingredients;** (Nitrogen, Phosphorous and Potassium).

3) The production of **nitric acid** (HNO_3) by **Oswald process**

4) Photodissociation of nitrogen dioxide (NO_2) and photochemical smog.

5) Isolation of pure silicon **(Si)** from **silica (SiO_2)**.

6) In aqueous solution, addition of **glycerol to $B(OH)_3$**, makes the later strong monobasic acid.

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II) B-Complete (6 only) the following chemical equations:- **(8 marks)**

1) $Ba + O_2$ (at 500 °C) →

2) $CH_4 + H_2O$ (Ni, 1000 °C) →

3) $CaC_2 + H_2O$ →

4) $Al_4C_3 + H_2O$ →

5) $KO_2 + H_2O$ →

6) $Ca(H_2PO_4)_2 + NaHCO_3$ (300 °C) →

7) $P_4O_{10} + H_2SO_4$ →

8) $NH_3 + CO_2 + NaCl + H_2O$ →

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III) Answer (3 only) of the following:- **(24 marks)**

1) Give an account for ortho and para hydrogen

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2) Diamond and graphite are two allotropic forms of carbon, compare between these two forms

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3) Describe the structure and bonding of Diborane (B_2H_6)

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4) Explain how Silicon can be converted to semiconductors (n-type & p-type)

Best wishes

Prof. Kamal Ahmed, Prof. Gabr Abou El Reash, Prof. Tawfik Rakha, Prof. Sahar Mostafa

Mansoura University Faculty of Science Chemistry Department Subject: Inorganic Chemistry CHEM 221 (s & p-Block elemnets)		First Semester 2nd Level Microbiology Students Date: 4th Jan. 2015 Time: 2 hours Marks: 80

Answer The Following Questions

I) Comment on (7 only) of the following:- **(28 marks)**

1) The reactivity of elements of **Group IA** with water increases down the group.

2) The 1st Ionization Energy (1st IE) of **($_{12}$Mg, $_{15}$P and $_{18}$Ar)** is high **while** for **($_{16}$S)** is low.

3) Berylium metal is amphoteric **whereas** aqueous solutions of Be(II) salts are acidic.

4) Boron trifluoride **(BF_3)** is Lewis acid.

5) The size of sodium ion **(Na^+)** is smaller than that of sodium atom **(Na), while** that of **Cl^-** is larger than **Cl**.

6) In aqueous solutions, cesium ions **(Cs^+)** conduct electricity more than **(Li^+)**, while the crystalline salts show decrease on the hydration.

7) Thallous (I); **$_{81}Tl^+$** compounds are stable.

8) **B_2O_3** shows amphoteric behaviour.

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