

Ebonyi State University

EBSU

POST-UTME

Past Questions

Subjects:

➤ *English*

Biology

Chemistry

➤ *Mathematics*

Physics

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In each of questions 1-3, choose the word(s) that best complete the meaning in the sentences.

1. We watched the woman as she stood up and _____ herself more comfortably.

- A. reseated
- B. resat
- C. reseat
- D. resitted

2. The students _____ the principal's appeal for calm and took to the streets.

- A. deferred
- B. defied
- C. differed
- D. defiled

3. The noise from the record seller's workshop _____ on my ears

- A. jeers
- B. jams
- C. jars
- D. jarrs

In questions 4-6, choose the option opposite in meaning to the word(s) in italics

4. The Military Governor upheld the decision of his cabinet.

- A. held up
- B. undercut
- C. maintained
- D. abolish
- E. reversed

5. Chidi is naturally taciturn

- A. friendly
- B. cheerful
- C. dumb
- D. lively
- E. garrulous

6. James is a disco-addict. He takes his studies rather lightly

- A. humorously
- B. gloomily
- C. tediously
- D. carefully
- E. seriously

In questions 7-9, choose the word(s) or phrase which best fills the gap.

7. There's _____ ventilation in this room; that's why don't breathe well

- A. few
- B. a few
- C. little
- D. a little

8. Whenever he put the light on, someone _____ to disturb him.

- A. came
- B. comes
- C. has come
- D. would come

9. It be taken for repair after all; it's working again.

- A. couldn't
- B. mightn't
- C. shouldn't
- D. needn't

10. chassis

- A. chip
- B. sharp
- C. cheat
- D. character

ANSWERS TO 2009/2010 EBSU ENGLISH POST-UTME QUESTIONS

**1. A 2. B 3. C 4. E 5. A 6. E 7. C
8. B 9. D 10. B**

Comprehension

I am always amazed when I hear people saying that sport creates goodwill among nations, and that it only the common peoples of the world could meet one another at football or squash. They would have no inclination to meet on the battle field. Even if one didn't know from concrete examples (the 1936 Olympic Games, for instance that international sporting contests lead to orgies of hatred), one could deduce it from general principles.

Nearly all the sports practiced nowadays are competitive. You play to win, and the game has little meaning unless you do your utmost to win. One the village green, where you pick up sides and no feeling of local patriotism is involved, it is possible to play simply for the of it and exercise; but as soon as the question of prestige arises, as soon as you

feel that you and some larger unit will be disgraced if you lose, the most savage combative instincts are aroused. Anyone who has played even in a school football march knows this.

At the international level, sport is frankly a mimic warfare. But the significant thing is not the behaviour of the players but the attitude of the spectators; and, behind the spectators, of the nations who work themselves into furies over these absurd contests and seriously believe at any rate for short period-that running, jumping and kicking a ball are tests of national virtue. Even a leisurely game demanding grace rather than strength can cause much ill-will.

Football, a game in which everyone gets hurt and every nation has its own style of play is far worse. Worst of all is boxing. One of the most horrible sights in

the world is a fight between white and coloured boxers before a mixed audience.

1. The 1936 Olympic Games was cited in the passage as an example to show that sports can_____

- A. lead to excessive hatred
- B. create goodwill among nations
- C. generate feelings of national prestige
- D. make people meet on the battle field

2. According to the Passage, _____

- A. all the sports practiced nowadays are competitive
- B. games have meaning only when the participants play to win
- C. it is possible to play a game simply the fun of it
- D. on the local green, you play not to win but for the fun of it

3. Boxing is regarded as the worst game in the passage because

A. of the behaviour of the boxers themselves

B. of the amount of that can be generated among spectators of different races

C. of the ill-will that can be generated by a game that demands strength from the competitors

D. it is a game which both players get hurt rather badly

4. Which of the following statements is TRUE according to the passage?

A. Running, jumping and kicking a ball are tests of national virtue

B. At the national level, sport is frankly a mimic warfare

C. The most savage combative instincts are aroused by anyone who has played in a school football match

D. Nations work themselves up because they tend to believe that sports are tests of national virtue

5. 'Mimic' as used in the passage means_____

- A. comic
- B. silent
- C. imitated
- D. practiced

LEXIS AND STRUCTURE

In questions 6 to 8, choose the option opposite the meaning to the word(s) in italics.

6. The western allies frowned at their enemies' *indiscriminate* bombing of their territory.

- A. Impartial
- B. selective
- C. unprovoked
- D. divided

7. This average fertility figure, of course *conceals* wide individual variations among the people.

- A. attracts

- B. covers
- C. exposes
- D. concludes

8. The hasty action will bring nothing but *discredit* to them.

- A. honour
- B. shame
- C. reward
- D. disgrace

In questions 9 to 11, choose the option nearest in meaning to the word(s) phrase(s) in italics.

9. Mary stole the *day's takings* from the bakery.

- A. receipts
- B. collections
- C. contributions
- D. offerings

10. After careful investigation, the police found no *iota* of truth in Ibrahim's allegations

- A. quota
- B. grain
- C. evidence
- D. statement

11. Most of his observations were *wide off the mark*.

- A. comprehensible
- B. irrelevant
- C. Pertinent
- D. unacceptable

In questions 12 to 15, choose the word(s) or phrase(s) which best fill(s) the gap(s).

12. When the driver lost control of his vehicle, the pedestrians began to run for_____.

- A. their dear lives
- B. their dear live
- C. dear lives
- D. dear life

13. Okoro intends to wear his _____dress to the zoo this afternoon.

- A. white cotton new
- B. white new cotton
- C. new white cotton
- D. cotton white new

14. The _____ car is the centre of attraction.

- A. small racing light-green
- B. racing small light-green
- C. small light-green racing
- D. light-green small racing

15. Tsado and his wife are always fighting. The _____ to be drawn from this is that they are not happy together.

- A. reference
- B. inference
- C. difference
- D. deference

SOLUTION TO 2012/2013 USE OF ENGLISH QUESTIONS

**1. A 2. C 3. B 4. D 5. C 6. B 7. C
8. A 9. A 10. B 11. B 12. A 13. C
14. C 15. B**

Comprehension:

My good people: I come before you this evening as a man whose honesty and integrity have been questioned. Now, the usual political thing to do when charges are levelled against you is either to ignore them or to deny them without giving details. But before I answer any of your questions, let me state categorically that I have not touched a kobo of the ₦500,000 we contributed.

Every kobo of it has been used in defraying political campaign expenses. As a matter of fact, during one of my meet-the-press conferences. Mr James Ukpong accosted me and said, 'Honourable Senator, what about this fund we hear about?' I told him there was no secret about the fund and that he should meet Ken Kamalu to get details of the fund. I told him 'You will find that the

purpose of the fund was primarily to defray political expenses.'

In answer to another one of his questions, I said that neither contributors to this fund, not contributors to any of my campaigns had ever received any special consideration that he would not have received as an ordinary constituent.

And I can say that never, since I became a Senator, have I made a telephone call for them to an agency or have I gone down to an agency on their behalf.

Records will show that, and these records are in the hands of the Administrator.

1. The author is_____

- A. exonerating himself from allegations embezzlement
- B. ignoring the allegations of embezzlement

- C. taking part in a political campaign
- D. demonstrating that he is a Senator
- E. trying to implicate Ken Kamalu, a fellow politician

2. Constituent in the passage means_____

- A. a section of his constituency
- B. his entire constituency
- C. his campaigner
- D. a person having voting rights
- E. a supporter

3. Accosted in the passage means _____

- A. grossly insulted
- B. greeted
- C. fought with
- D. fore
- E. went and spoke to

4. It appears that the ₦500,000 _____

- A. has been spent

- B. has been paid into the government treasury
- C. will soon be paid into the government of treasury
- D. has been saved by Ken Kamalu
- E. will be used for future campaigns

5. Ken Kamalu is portrayed as _____

- A. a corrupt politician
- B. the administrator of the fund
- C. an ordinary taxpayer
- D. a government official
- E. a citizen

LEXIS AND STRUCTURE

In questions 6 to 9, choose the word(s) opposite in meaning to the word underlined.

6. He is loved his altruism.

- A. benevolence
- B. sincerity
- C. Selfishness

D. selflessness

E. kindness

7. Disgruntled people are indifferent to any plans to rid the society of evil.

A. different from

B. diffident about

C. in agreement with

D. interested in

E. opposed to

8. This card entitles you to attend the film show.

A. disqualifies

B. discourages

C. Disenchants

D. proclaims

E. satisfies

9. Kelechi hardly ever falls sick.

A. most often

B. very seldom

C. Sometimes

D. frequently

E. occasionally

10. Little Ugochi has a bicycle, which is in Marvellous condition.

A. need of a tune up

B. excellent

C. Questionable

D. unstable

E. working

11. Many states practice the ideals of democracy.

A. government by elections

B. government by representatives

C. government by civilians

D. government by all the people

E. oligarchy

12. The principal advised that we pursue this case cautiously, otherwise we are bound to be taken _____ by Ada's lies.

A. away

B. out

C. in

D. off

E. on

13. Samuel: Would you please come here, John?

John: No. I'm busy _____ in my farm.

- A. I am working
- B. I'm working
- C. I am to work
- D. I shall have worked
- E. I go to work

14. James _____ reminding that not all that glitters are gold.

- A. needs
- B. need
- C. needing
- D. needs to
- E. need to

15. The plane overshot the _____ in a minor accident.

- A. railway
- B. hanger
- C. tarmac
- b. runway
- E. road

SOLUTIONS TO 2013/2014 USE OF ENGLISH

1. A 2. D 3. E 4. A 5. B 6. C 7. D
8. A 9. A 10. B 11. B 12. C 13. B
14. A 15. D

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Comprehension passage

Instruction: Read the passage carefully and answer the questions that follow

Standard English refers to authoritative and correct usage of the language, the medium of expression for government and education. Its opposite is a dialectal variant of the language, that is, accepted recognized words, expressions and structures peculiar to smaller group of language user who are generally set apart from standard usage by cultural group or geographical region.

For example, Nigeria, American Irish and British English differ from one another in many respects and each is identifiable, yet in every case the moves towards informality and away from the observance of strict

rules, emphasis falls on the difference between dialects.

In addition to America English being distinguishable from British English, it is also true that British English is not uniform within the United Kingdom. The level of formalities determine by education and aspiration why dialects vary from region to region.

1. The author refers to Standard English as_____

- A. a dialectal variant of language
- B. an authoritative style of usage
- C. the orthodox and accurate usage of the language
- D. the accepted and recognized words expression and structures, peculiar to a smaller group of language users

2. According to the author, Nigerian, American, Irish and

British English can be regarded as_____

- A. registers
- B. standards
- C. styles
- D. languages

3. The observance of strict rules is a feature of _____

- A. formality
- B. dialects
- C. languages
- D. unconventionality

Lexis and Structure

In each of question 4 to 5, select the option that best explains the information conveyed in the sentences

4. My son, who is in the U.S.A. is studying Engineering

- A. My only son is in the U.S.A. studying Engineering

B. one of my sons is in the U.S.A studying Engineering

C. My sons are in the U.S.A but only one is studying Engineering

D. Only my son is in the U.S.A studying Engineering

5. The mills of God grind slowly, but they grind exceedingly small

A. God has a mill where every material in life is thoroughly ground.

B. God may seem slow in action, but He adequately reward every bit of injustice

C. The world is like a food factory where God takes His time in grinding all raw materials properly

D. Even though God is never in a hurry, He achieves things

In each of questions 6-8, choose the most appropriate option opposite in meaning to the words or phrase in italics.

6. Good students can easily identify *spurious* arguments.

- A. genuine
- B. interesting
- C. false
- D. illogical

7. We watched in wonder as she rattled away in that *esoteric* language.

- A. inscrutable
- B. familiar
- C. secret
- D. obscure

8. Many species in creation are *mutated* over the year into new form of life.

- A. stabilized
- B. manifested
- C. transformed
- D. Standardized

9. In spite of many days of fasting Musa is still *fastidious* about his food.

- A. Particular
- B. undecided

- C. indifferent
- D. in mindful

In each of questions 9-11, choose the most appropriate option nearest in meaning to the word(s) or phrase in italics

10. The young man's behaviour shows that he was at the *top of the tree*.

- A. at the highest position in his profession
- B. confused
- C. At a point of preparedness to show good example
- D. arrogant

11. The doctor insisted on giving all of us *prophylactic* drug.

- A. curative
- B. preventive
- C. routine
- D. special

In each of questions 12 -15, fill with the most appropriate option from the list following the gap

12. The director, not less than his workers _____ to blame.

- A. is
- B. are
- C. were
- D. ought

13. He did not explain what happened _____.

- A. either
- B. never
- C. neither
- D. rather
- E. did she

14. It was an _____ moment for us to welcome the new vice chancellor.

- A. opportune/privileged
- B. opportuned/privilege
- C. opportune/opportune

D. opportuned/opportune

15. A very popular ruler is at the _____.

- A. helms of affair
- B. helm of affair
- C. realm of affair
- D. helm of affairs

SOLUTION TO 2014/2015 USE OF ENGLISH

**1. B 2. B 3. A 4. B 5. D 6. A 7. B
8. A 9. C 10. A 11. A 12. A 13. C
14. B 15. D**

INSTRUCTIONS: Read the passage carefully and answer the questions that follow.

By 1910, the motor car was plainly conquering the highway. The private car was now part of every rich man's establishment, although its price made it as yet an impossible luxury for most of the middle class. But for the adventuresome youth, there was the motorcycle, a fearsome invention producing accidents and ear-splitting noises.

Already, the dignified carriages and smart pony-traps were beginning to disappear from the roads, and coachmen and grooms, unless mechanically minded, were finding it more difficult to make a living.

The roads, which had gone to sleep since the coming of the railway, now awoke to feverish

activity. Cars and motor cycles dashed along them at speeds which rivalled those of the express trains, and the lorry began to appear.

Therefore, the road system was compelled to adapt itself to a volume and speed of traffic for which it had ever been intended. Its complete adaptation was impossible, but the surface was easily transformed and, during the early years of the century, the dustiness and greasiness of the highways were lessened by tar spraying. To widen and straighten the roads and get rid of blind corners and every steep gradient were tasks which had scarcely been tackled before 1914.

The situation was worst of all in towns where not only was any frequently increased by the short-sighted eagerness of town authorities in laying down tramlines. Yet it was not only the

road system that was in need of readjustment; the nervous of those who used and dwelt by the road suffered. The noises caused by the conversion of the roads into speedways called for a corresponding tightening up of the nerves; and especially in the towns, the pedestrian who wished to preserve life and limb was compelled to keep his attention continually on the stretch, to practice himself in estimates of the speed of approaching vehicles and to run or jump for his life ventured off the pavement.

1. The writer seems to suggest that

- A. roads that existed were dormant
- B. coachmen and grooms were not mechanically minded
- C. there were no roads before the ad of cars and motorcycles and so people had to be mechanically minded

D. volume and speed of traffic on the roads increased with the advent of cars, motorcycles and lorries

2. The writer uses the expression unless mechanically minded to refer to

- A. coachmen and grooms adaptable to the new technology
- B. coachmen grooms who chose to become mechanics
- C. town authorities laying down tramlines
- D. those amenable to change and development

3. The statement by 1910, the motor car was plainly conquering the highway means that

- A. by 1910 many people knew how to drive motor cars
- B. the motor car was invented in 1910
- C. highway codes for motor cars came into effect by 1910

D. by 1910 motor cars became common sight on the highways

In each of questions 4 to 6, choose the option nearest in meaning to the word(s) or phase in italics

4. I cannot understand why Ali should serve in that *Moribund* administration

- A. oppressive
- B. prodigal to
- C. crumbling
- D. purposeless

5. The *coalescence* of the groups created additional problems.

- A. proscription
- B. fighting
- C. disbandment
- D. union

6. Any chief executive of an organization would find *radical changes* blocked at every turn.

- A. developments
- B. ideas
- C. suggestions
- D. innovations

Select the option that best explains information conveyed in the sentence

7. You must not attend the end of-year-party.

- A. it is not necessary that you attend the party
- B. it is necessary that you do not attend the party
- C. you do not have to decide whether to attend the party or not
- D. you have to decide whether to attend the party or not

Identify the word that has the stress on the first syllable

- 8. A. resist
- B. salon
- C. confirm
- D. intact

Choose the word opposite in meaning to the word in italics

9. What a harmless thought he has.

- A. pernicious
- B. pleasant
- D. pertinent
- D. perfect

Choose the word that has the same consonant sound as the one represented by the letter(s) underlined

10. Sure

- A. cheer
- B. cheap
- C. charlatan
- D. church

In question 11, the word in capital letters has an emphatic stress. Choose the option that best fits the expression in the sentence.

11. My neighbour BRUISED his thigh while playing football

- A. did your neighbour break his leg while playing tennis?
- B. Did your neighbour fracture his thigh while playing football?
- C. Was your neighbour involved in an accident?
- D. Did your neighbour play football yesterday

In each of question 10 to 15, fill each gap with the most appropriate option from the list provided.

12. I do not think any sane person would have acted in such a _____manner

- A. rational
- B. composed
- C. secret
- D. cruel

13. Modern dancing has become' rather scientific and so requires.

- A. bizarre costuming
- B. some choreographic skill
- C. immense instrumentation
- D. a rapping voice

14. The government which
____recruiting____workers
suddenly stopped doing so.

- A. are/its
- B. was/it
- C. is/their
- D. were/their

15. Neither Agbo nor his parents
_____the meetings now.

- A. attended
- B. attend
- C. has attended
- D. attends

SOLUTION TO 2015/2016 USE OF ENGLISH

1. D 2. A 3. D 4. C 5. D 6. D 7. B
8. B 9. A 10. C 11. B 12. D 13. B
14. B 15. B

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EBSU 2009/2010 MATHEMATICS QUESTIONS

1. Express $8 \times 10^{-2} - 2 \times 10^{-5}$ as a fraction

- A. $\frac{1}{4}$
- B. $\frac{5}{2}$
- C. $\frac{2}{5}$
- D. $\frac{1}{5}$

2. Find the values of x for which $22^{2x+3} - 33 \times 2^x \div 4 = 0$

- A. $x=2, x=-3$
- B. $x=-2, x=3$
- C. $x=4, x=1/8$
- D. $x=2, x=3$

3. If $2609-1002=66n$, find n .

- A. 7
- B. 9
- C. 10
- D. 8

4. Find the values of x such that

$$\begin{pmatrix} 2 & 7 \\ 3 & \frac{1}{2} \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 10 \\ 7 \end{pmatrix}$$

- A. $x=y=2$
- B. $x=2, y=-2$

C. $x=-2, y=2$

D. $x=y=-2$

5. A chord of a circle of radius 13cm is drawn 5cm from the center of the circle. Find the length of the chord.

- A. 12cm
- B. 124
- C. 18cm
- D. $\sqrt{194}$

6. If $x-2$ is a factor of $px^3 + 2x^2 - 2p + 12$, find the value of p .

- A. $\frac{8}{5}$
- B. $\frac{10}{3}$
- C. 2
- D. -2

7. In a regular pentagon ABCDE, AC intersects BD at p . Calculate $\angle CPD$.

- A. 108°
- B. 36°
- C. 72°

D. 48°

8.

Subjects	Bio	Chem	Maths	Phy
Marks	95	$2x+10$	x	75

The above shows the marks obtained by a student in an examination. If the total mark obtained is 300, what is the angle corresponding to the mark obtained in Chemistry. If the information is represented in a pie chart?

- A. 120°
- B. 144°
- C. 48°
- D. 108°

9. A ladder 17m rests against a vertical wall so that its foot is 8.5m from the wall. Find the angle of inclination of the ladder to the horizontal floor.

- A. 30°
- B. 60°
- C. 45°

D. 55°

10. Evaluate $\lim_{x \rightarrow 2} \frac{x^2 - x - 6}{x - 2}$

- A. 0
- B. 5
- C. ∞
- D. 1

11. If $\frac{dy}{dx} = 6x - 3$ and $y(-1) = 8$, find $y(x)$.

- A. $3x^2 - 3x - 8$
- B. $3x^2 - 3x + 8$
- C. $3x^2 - 3x - 2$
- D. $3x^2 - 3x + 2$

12. The minimum of the function $f(x) = 2x^2 - 12x + 5$

- A. 59
- B. -59
- C. 3
- D. -3

13. A basket contains 5 MTN cards, 6 GLO cards, 3 MTEL cards and 6 Vmobile cards. What is the probability that a card is selected

from the basket at random will be MTN or MTEL card?

- A. $\frac{3}{20}$
- B. $\frac{3}{4}$
- C. $\frac{1}{4}$
- D. $\frac{2}{5}$

14. Find the range of the numbers $\frac{1}{3}$, $\frac{1}{2}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{2}{3}$, $\frac{6}{7}$, $\frac{8}{9}$

- A. $\frac{7}{27}$
- B. $\frac{13}{45}$
- C. $\frac{9}{5}$
- D. $\frac{5}{9}$

15. If the mean of the numbers 4, 3, 5, x 7 is 5, find the variance.

- A. 2
- B. 10
- C. $\sqrt{2}$
- D. 5

ANSWERS TO 2009/2010 MATHEMATICS QUESTIONS

**1. C 2. A 3. D 4. - 5. B 6. D 7. C
8. D 9. B 10. B 11. D 12. C 13.
D 14. D 15. C**

EBSU 2012/2013 MATHEMATICS QUESTIONS

1. A trader bought 100 oranges at 5 for ₦1.20; 20 oranges got spoilt and the remaining were sold at 4 for ₦1.50. Find the percentage gain or loss.

- A. 30% gain
- B. 25% gain
- C. 30% loss
- D. 25% loss

2. Simplify $\frac{\sqrt{0.0023 \times 750}}{\sqrt{0.00345 \times 1.25}}$

- A. 15
- B. 20
- C. 40
- D. 75

3. The first term of a geometrical progression is twice its common ratio. Find the sum of the first two terms of the progression if its sum to infinity is 8.

- A. $\frac{8}{5}$
- B. $\frac{8}{3}$
- C. $\frac{72}{25}$

D. $\frac{56}{9}$

4. The sum of two members is twice their difference. If the difference of the number is P, find the larger of the two numbers.

- A. $\frac{p}{2}$
- B. $\frac{8}{3}$
- C. $\frac{5}{2}$
- D. 3p

5. In ΔMNO , $MN=6$ units, $MO=4$ units and $NO=12$ units. If the bisector of angle M meets NO at P. Calculate NP.

- A. 4.8 units
- B. 7.c units
- C. 8.0 units
- D. 18.0 units

6. Find the equation of the locus of a point $P(x,y)$, such that $PV=PW$, where $V=(1,1)$ and $W=(3, 5)$

- A. $2x+2y=0$

B. $2x+3y=8$

C. $2x+y=9$

D. $x+2y=8$

7. From the Point P, the bearing of two points Q and R are $N67^\circ W$ and $N23^\circ E$ respectively. If the bearing of R from Q is $N68^\circ E$ and $PQ=15m$, calculate PR.

A. 120m

B. 140m

C. 150m

D. 160M

8. What is the derivative of $t^2 \sin(3t-5)$ with respect to the variable?

A. $6t \cos(3t-5)$

B. $2dt \sin(3t-5) - 3t^2 \cos(3t-5)$

C. $2t \sin(3t-5) + 3t^2 \cos(3t-5)$

D. $2t \sin(3t-5) + t^2 \cos 3t$

9. How many two digit numbers can be formed from the digits 0, 1, 2 if a digit can be repeated, and no number may begin with 0?

A. 4

B. 12

C. 16

D. 20

10. The mean of four numbers is 5 and the mean deviation is 3. Find the fourth number if the mean deviation of the first three numbers is 2.

A. 6

B. 10

C. 11

D. 17

11. Three times the second term plus the seventh term of AP is equal to the twelfth term. Find the relationship between the first term a and the common difference d .

A. $3a-2d=0$

B. $3a+2d=0$

C. $3a+d=0$

D. $3a-d=0$

12. Find $\frac{dy}{dx}$ if $y = 2x^2 - \sin 2x$

- A. $4x+2 \cos x$
- B. $4x-2\cos 2x$
- C. $4x+2\cos 2x$
- D. $4x-2\cos x$

13. A bag contains $4x$ First bank ATM cards, $(2x-1)$ UBA Bank ATM cards and $3(x+1)$ Zenith ATM cards. If the probability of picking a First Bank ATM is $\frac{2}{5}$, how many UBA Bank ATM cards are in the bag?

- A. 3
- B. 8
- C. 9
- D. 20

14. A student dropped an object from a building 100m high. If the height of the object above ground after t seconds is $100-4.9t^2$ m. How fast is it falling 3 seconds after it is dropped?

- A. 14.7 m/sec
- B. 85.3 m/sec
- C. 29.4 m/sec
- D. 70. 6 m/sec

15. If $\log_{10} 4=x$, express $\log_{10}(12.5)^2$ in terms of x .

- A. $4-3x$
- B. $4-6x$
- C. $4+3x$
- D. $4(1-x)$

ANSWERS TO 2012/2013 MATHEMATICS QUESTIONS

1. B 2. B 3. C 4. B 5. B 6. D 7. C
8. C 9. B 10. C

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1. Simplify $\sqrt[5]{(243)^{-1}x^5}$

- A. $x/3$
- B. $3/x$
- C. $-x/3$
- D. $-3/x$

2. Without using tables, evaluate

$$(125)^{-\frac{1}{3}} \times (0.49)^{-1} \times 2 \times (0.01)^{-\frac{1}{2}}$$

- A. $7/20$
- B. $20/7$
- C. $5/7$
- D. $7/5$

3. Convert 1231_4 to a number in base 6.

- A. 105_6
- B. 301_6
- C. 103_6
- D. 501_6

4. Find the slope of the curve $y=3x^3 + 5x^2 - 3$ at $(-, 5)$

- A. 1
- B. -1

- C. 19
- D. -19

5. Find the area of the region bounded by $y=x^2-x-2$ and axis.

- A. $9/2$
- B. $-9/2$
- C. $8/3$
- D. $16/3$

6. The minimum of $y = x^2 - 4x - 5$ is

- A. 2
- B. -2
- C. 13
- D. -13

7. Make x the subject of the relation $y=3-Inx$

- A. e^{2-y}
- B. e^{y+3}
- C. $y/3$
- D. $3/y$

8. Find x, y for which $\begin{pmatrix} 2x & 4 \\ 3 & y \end{pmatrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 10 \\ -1 \end{pmatrix}$

- A. (1, -2)
- B. (1, 2)
- C. (-1, 2)
- D. (2, -1)

9. Simplify $\frac{\frac{1}{\frac{1}{2}}}{2 \div (\frac{1}{4} \text{ of } 12)}$

- A. 3/256
- B. 3/32
- C. 6
- D. 85

10. The probability of either event A or B is $\frac{5}{6}$, while that of event B is $\frac{1}{6}$. If the probability of both A and B is $\frac{1}{2}$, what is the probability of event A?

- A. $\frac{3}{4}$
- B. $\frac{5}{6}$
- C. $\frac{1}{4}$
- D. $\frac{3}{5}$

11. The chances of three independent events X, Y, Z

occurring are $\frac{1}{2}, \frac{2}{3}, \frac{1}{4}$ respectively. What are the chances of Y and Z only occurring?

- A. $\frac{1}{8}$
- B. $\frac{1}{24}$
- C. $\frac{1}{12}$
- D. $\frac{1}{4}$

12. Some red balls were put in a basket containing 12 white balls and 16 blue balls. If the probability of picking a red ball from the basket is $\frac{3}{7}$, how many red balls were introduced?

- A. 13
- B. 20
- C. 12
- D. 21

13. Find the coordinates of the mid-point of the line joining (2, 7) and (1, -6)

- A. $(\frac{1}{2}, \frac{13}{2})$
- B. $(\frac{3}{2}, \frac{1}{2})$

C. $\left(\frac{1}{2}, \frac{1}{2}\right)$

D. $\left(\frac{3}{2}, \frac{13}{2}\right)$

14. An equilateral triangle of sides 2cm is inscribed in a circle. Find the area of the circle.

A. $4\pi \text{ cm}^2$

B. $8\pi \text{ cm}^2$

C. $\frac{4}{3}\pi \text{ cm}^2$

D. $\frac{3}{4}\pi \text{ cm}^2$

15. The chord PQ of a circle is equal to the radius, r of the circle. Find the length of the arc PQ.

A. $\frac{3\pi}{4}$

B. $\frac{\pi r}{4}$

C. $\frac{\pi r}{3}$

D. $\frac{\pi r}{6}$

ANSWERS TO 2013/2014 MATHEMATICS QUESTIONS

**1. A 2. B 3. B 4. B 5. – 6. A 7. A
8. A 9. C 10. - 11. D 12. D 13. B
14. D 15. C**

1. The average of three numbers is 32_5 . If the sum of two of the numbers is 131_4 , find the third number in base 6.

- A. 43_6
- B. 34_6
- C. 23_6
- D. 32_6

2. Three times the second term plus the seventh term of an AP is equal to the twelfth term. Find the relationship between the first term a and the common difference d .

- A. $3a - 2d = 0$
- B. $3a + 2d = 0$
- C. $3a + d = 0$
- D. $3a - d = 0$

3. A fence of 36m is to be built to make three sides of a rectangular compound, the fourth side being a building. Find the possible length of the shorter sides of the

compound if the area enclosed is 160m^2 .

- A. 20m, 10m
- B. 16m, 8m
- C. 20m, 16m
- D. 10m, 8m

4. Find $\frac{dy}{dx}$ if $y = 2x^2 - \sin 2x$

- A. $4x + 2\cos x$
- B. $4x - 2\cos 2x$
- C. $4x + 2\cos 2x$
- D. $4x - 2\cos x$

5. A bag contains $4x$ first bank ATM cards, $(2x - 1)$ UBA bank ATM cards and $3(x - 1)$, Zenith bank ATM cards. If the probability of picking a First bank ATM is $\frac{2}{5}$, how many UBA bank ATM cards are in the bag?

- A. 3
- B. 8
- C. 9
- D. 20

6. Express the product of 0.000128 and 0.00125 in standard form

- A. 1.6×10^{-11}
- B. 1.6×10^{-5}
- C. 1.6×10^{-7}
- D. 1.6×10^{-4}

7. Make x the subject of the relation $y = 3 - \ln x$

- A. e^{2-y}
- B. e^{y+3}
- C. $y/3$
- D. $3/y$

8. In the diagram below O is the centre of the circle of radius 42cm. Find the area of the shaded portion (Take $\pi = 22/7$).

- A. 903cm^2
- B. 441cm^2
- C. 464cm^2
- D. 21cm^2

9. A student dropped an object from a building 100m high. If the

height of the object above the ground after t seconds is $100 + 4.9t^2\text{m}$, how fast is it falling 3 seconds after it is dropped?

- A. 14.7 m/sec
- B. 85.3 m/sec
- C. 29.4 m/sec
- D. 70.6 m/sec

10. An investor who invested ₦6,500.00 at some simple interest rate collected a total amount of ₦7,800.00 after four years. How much simple interest would he have collected after two years if he had invested ₦9,000.00?

- A. ₦1,000.00
- B. ₦10,000.00
- C. ₦5,400.00
- D. ₦900.00

11. Differentiate $(\cos\theta + \sin\theta)^2$ with respect to θ

- A. $2\cos 2\theta$
- B. $2\sin 2\theta$

C. $-2\cos^2 \theta$

D. $-2\sin^2 \theta$

12. If the sum of the roots of the equation $2x^2 - 5px + 8 = 0$ is five times the product of the roots, find the value of p.

A. -8

B. $1/2$

C. 8

D. $-1/2$

13. Find the area of the region enclosed by the curve $y = 2 - x^2$ and the line $y = -x$

A. $3/2$

B. 9

C. 3

D $9/2$

14. In the figure below, $\angle PQS = \angle PRS = \angle PSR$ and $\angle SRT = 72^\circ$. Find $\angle QPS$

15. If $x - 1$ is a factor of $3x^2 - px^2 + 5x - 3p$, find the value of p

A. -2

B. 2

C. $1/2$

D. $-1/2$

ANSWERS TO 2014/2015 MATHEMATICS QUESTIONS

1. B 2. A 3. D 4. B 5. A 6. C 7. A
8. D 9. C 10. C 11. A 12. C 13.
D 14. C 15. B

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1. Find n if $314_{10} - 256_7 = 340_n$

- A. 7
- B. 8
- C. 9
- D. 10

2. What is the difference between 1.867551 correct to four significant figures and 1.867551 correct to four decimal places?

- A. 5×10^{-3}
- B. 4×10^{-4}
- C. 5×10^{-4}
- D. 10×10^{-3}

3. In an examination, all the candidates offered at least one of English and French, if 52% offered French and 65% offered English, what percentage offered French only?

- A. 17%
- B. 35%
- C. 48%
- D. 45%

4. Simplify

$$2x^2 + x - 8\sqrt{6x^3 + 5x^2 - 8x - 3}$$

- A. $3x - 1$
- B. $1 - 3x$
- C. $3x + 1$
- D. $-(3x + 1)$

5. Find the range of values of x satisfying the inequalities $2x - 5 < 7$ and $25 + 2x > 15$

- A. $5 < x < 6$
- B. $-5 < x < 6$
- C. $-6 < x < 5$
- D. $-6 < x < -5$

6. If the 8th term of an A.P is three times the second term and the sum of the first three term is 18, find the first term of the A.P

- A. 4
- B. 2
- C. 8
- D. 3

7. Find the sum to infinity of the series $4+3+\frac{9}{4}+\frac{27}{16}+\dots$

- A. 16
- B. $\frac{27}{16}$
- C. 1
- D. 8

8. A chord of a circle of radius 10cm is drawn 8cm from the centre of the circle. Find the length of the chord.

- A. 6
- B. $2\sqrt{41}$
- C. 12
- D. $\sqrt{41}$

9. Find the equation of the line which passes through $(-2, 1)$ and is perpendicular to the line $4x-2y+1=0$

- A. $2y-x-4=0$
- B. $2y+x=0$
- C. $2y-x=0$
- D. $y-2x-5=0$

10. If a line is parallel to the line $2y-rx+4=0$ and perpendicular to the line $4y+x-28=0$, then the value of r is__.

- A. 4
- B. 8
- C. -8
- D. -4

11.

Score	0	1	2	3	4	5
No. of students	2	8	14	16	12	8

The distribution above shows the scores of sixty (60) students in a class test. What percentage of the students scored at least 3?

- A. 60%
- B. 36%
- C. 66%
- D. 40%

12. The first derivative of $y=(2+3x)^4$ at $x=-1$ is _____

- A. 12

- B. -12
- C. 4
- D. -4

13. The minimum value of $f(x) = x^2 - 4x + 5$ in the interval $[1, -1]$ is

- A. -2
- B. 10
- C. 4
- D. 5

14. The table BELOW shows the marks scored by a group of students in a class test. If the mean score is 3.4, find x.

Score	1	2	3	5	6
Frequency	3	6	7	x	4

- A. 3
- B. 4
- C. 5
- D. 2

15. A company is to select three different handset phones from five different types of Nokia brand

and two different types of Samsung brand. In how many ways can the company choose the handsets, so as to include at least one Samsung brand?

- A. 15
- B. 25
- C. 35
- D. 45

ANSWERS TO 2015/2016 MATHEMATICS QUESTIONS

1. A 2. B 3. B 4. C 5. B 6. A 7. A 8. C 9. B 10. B 11. A 12. B 13. A 14. C 15. B

EBSU 2009/2010 PHYSICS QUESTIONS

1. A motor tyre is inflated to pressure of $2.0 \times 10^5 \text{Nm}^{-2}$ when the temperature of air is 27°C . What will be the pressure in it at 87°C assuming that the volume of the tyre does not change?

- A. $2.6 \times 10^5 \text{Nm}^{-2}$
- B. $2.4 \times 10^5 \text{Nm}^{-2}$
- C. $2.2 \times 10^5 \text{Nm}^{-2}$
- D. $1.3 \times 10^5 \text{Nm}^{-2}$

2. The resistances of platinum wire at the ice and steam points are 0.75 ohm and 1.05 ohm respectively. Determine the temperature at which the resistance of the wire is 0.9 ohm

- A. 43.0°C
- B. 50.0°C
- C. 69.0°C
- D. 87.0°C

3. A trough 12.0cm deep is filled with water of refractive index $4/3$. By how much would a coin at the bottom of the trough appear to be

displaced when viewed vertically from above the water surface?

- A. 3.0cm
- B. 6.0cm
- C. 9.0cm
- D. 16.0cm

4. A galvanometer of internal resistance 50Ω has a full-scale deflection for a current of 5mA. What is the resistance required to convert it to a voltmeter with full scale deflection of 10V?

- A. 1750Ω
- B. 1950Ω
- C. 2000Ω
- D. 2500Ω

5. The cost of running five 60W lamps and four 100W lamps for 20 hours if electrical energy costs ₦10.00 per KWh is_____.

- A. ₦280.00
- B. ₦160.00
- C. ₦120.00

D. ₦140.00

6. From the generating station to each substation, power is transmitted at a very high voltage so as to reduce_____.

- A. eddy current loss
- B. hysteresis loss
- C. heating in the coil
- D. magnetic flux leakage

7. The relationship between the length(L) of air column in a pipe open at one end and the wavelength (λ) of the standing wave at the first overtone is_____.

- A. $2L = \lambda$
- B. $L = \lambda$
- C. $L = 3\lambda$
- D. $4L = 3\lambda$

8. If the angle of declination in a place is 10°E , calculate the true geographic bearing if the compass reads $\text{N}40^\circ\text{E}$.

- A. $\text{N } 50^\circ\text{E}$

B. $\text{N } 40^\circ\text{E}$

C. $\text{N } 30^\circ\text{E}$

D. $\text{N } 25^\circ\text{E}$

9. The electrochemical equivalent of platinum is $5.0 \times 10^{-7}\text{Kg/C}$. To plate-out 1.0kg of platinum, a current of 100A must be passed through an appropriate vessel for_____.

- A. 5.6 hours
- B. 56 hours
- C. 1.4×10^4 hours
- D. 2.0×10^4 hours

10. At what frequency would a capacitor of $2.5\mu\text{F}$ used in a radio circuit have a reactance of 250Ω ?

- A. $800/\pi$
- B. $200/\pi$
- C. $2000/\pi$
- D. $\pi/800$

ANSWERS TO 2009/2010 PHYSICS QUESTIONS

1. B 2. B 3. A 4. B 5. D 6. C 7. D
8. C 9. A

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EBSU 2012/2013 PHYSICS QUESTIONS

1. A lorry travels 10 km northwards, 4 km eastwards, 6 km southwards and 4 km westwards to arrive at a point T. What is the total displacement?

- A. 6km south
- B. 4km north
- C. 6km north
- D. 4km east

2. A particles starts from rest and moves with a constant acceleration of 0.5ms^{-2} . The distance covered by the particle in 10s is ____.

- A. 2.5m
- B. 5.0m
- C. 25.0m
- D. 50.0m

3. The product PV where P is pressure and V is volume has the same unit as____.

- A. Force
- B. Power

C. Energy

D. Acceleration

4. The amount of heat needed to raise the temperature of 10kg of copper by 1K is its____.

- A. specific heat capacity
- B. heat capacity
- C. latent heat
- D. internal heat

5. A note is called an octave of another note when____.

- A. its frequency is wide than that of the first note
- B. its frequency is half that of the first note
- C. the notes have the same fundamental frequency
- D. its periodic time is twice than that of the first note

6. To obtain a magnification of 2.5, how far should an object be placed from the pole of a thin

converging lens of focal length 10.2m?

- A. 0.13m
- B. 0.25m
- C. 0.28
- D. 0.50m

7. When white light is dispersed by a spectrometer, the component having the shortest wavelength is_____.

- A. orange
- B. green
- C. violet
- D. Red

8. A household refrigerator is rated 200 watts. If electricity costs 5k per kWh, what is the cost of operating it for 20 days?

- A. ~~N~~4.80
- B. ~~N~~48.00
- C. ~~N~~480.00
- D. ~~N~~4,800.00

9. The principle operation of an induction coil is based on_____.

- A. Ohm's law
- B. Ampere's law
- C. Faraday's law
- D. Coulomb's law

10. In a certain fusion reaction, a deuteron (${}^2_1\text{H}$) interacts with a triton (${}^3_1\text{H}$) and produces an α -particle (${}^4_2\text{He}$) and a second product. The second product is_____.

- A. A proton
- B. An electron
- C. A neutron
- D. A gamma ray

11. A string of length 4m is extended by 0.02m when a load of 04kg is suspended at its end. What will be the length of the string when the applied force is 15N? (Take $g=10\text{ms}^{-2}$)

- A. 5.05m
- B. 6.08m

C. 4.05m

D. 4.08m

12. Which of the following sets are vectors?

A. Acceleration, Velocity and moment

B. Mass, Force and Momentum

C. Force, Power and Density

D. Energy, Current and Volume

13. If the pressure on 100cm^3 of an ideal is doubled while its Kelvin temperature is halved, then the new volume of the gas becomes_____.

A. 25cm^3

B. 10.02cm^3

C. 10.02cm^3

D. 10.02cm^3

14. Dispersion of light by a glass prism is due to the _____.

A. different hidden colours of the glass

B. different speeds of the various colours in glass

C. defects in the glass

D. high density of the glass compared to air

15. In a resonance tube experiment, if the fundamental frequency of the vibrating air column is 280Hz, the frequency of third overtone is_____.

A. 70Hz

B. 840Hz

C. 1120Hz

D. 1960Hz

ANSWERS TO 2012/2013 PHYSICS QUESTIONS

**1. B 2. C 3. C 4. B 5. A 6. C 7. C
8. A 9. C 10. C 11. D 12. A 13. A
14. B 15. D**

EBSU 2014/2015 PHYSICS QUESTIONS

1. What is the least possible error in using a rule graduated in centimeters?

- A. 0.1cm
- B. 0.5cm
- C. 0.1cm
- D. 2.0cm

2. Which of the following affects the period of simple pendulum?

- (I) mass of pendulum bob
- (II) length of the pendulum
- (III) acceleration due to gravity

- A. I, II, and III
- B. II and III only
- C. I and III only
- D. I and II only

3. A boy sits in a train moving with a uniform speed on a straight track-if from his outstretched palm he gently tossed a coin vertically upwards, the coin will fall_____.

- A. in front of him palm
- B. behind his palm
- C. beside of his palm
- D. into his palm

4. A machine required 100J of work to raise a load of 500N through a vertical distance of 1.5m. Calculate the efficiency of the machine.

- A. 80%
- B. 75%
- C. 60%
- D. 33%

5. One of the most important application of bimetallic strip is found in the construction of_____.

- A. A thermostat
- B. An altimeter
- C. A thermocouple
- D. A hygrometer

6. At constant pressure, the density of a fixed gas is_____.

- A. constant with temperature

- B. proportional to its volume
- C. inversely proportional to its temperature
- D. independent of its volume

7. How much heat is absorbed when a block of copper of mass 0.05kg and specific capacity $390\text{Jkg}^{-1}\text{K}^{-1}$ is heated from 20°C to 70°C ?

- A. $3.98 \times 10^{-1}\text{ J}$
- B. $9.75 \times 10^2\text{ J}$
- C. $3.98 \times 10^3\text{ J}$
- D. $9.75 \times 10^3\text{ J}$

8. A block of ice floats on water inside a container. If the block of ice gets a container. If the block of ice gets completely melted, the level of water I the container will_____.

- A. increase
- B. remain the same
- C. decrease
- D. first decrease and then increase

9. The space between the double glass walls of a thermos flask is evacuated and the two surfaces facing the evacuated spaces are silvered. The residual source of heat loss takes place by_____.

- A. convection
- B. radiation from the surfaces
- C. conduction through the stopper and the glass
- D. conduction across the walls

10. Which of the following characteristics of wave is used in the measurement of the depth of the sea?

- A. diffusion
- B. interference
- C. refraction
- D. reflection

11. What is the frequency of the sound made by a siren having a disc with 32 holes and making 25 revolution per second?

- A. 80Hz

- B. 600Hz
- C. 800Hz
- D. 1600Hz

12. A concave mirror has a radius of curvature of 36cm at what distance from the mirror should an object be placed to give three times the size of the object?

- A. 12 cm
- B. 24 cm
- C. 48 cm
- D. 108 cm

13. When an ebonite rod is rubbed with fur, it has_____.

- A. No charge at all
- B. A negative charge
- C. A positive charge
- D. negative and positive charges

14. The angle between the direction of the earth's magnetic field and the horizontal is called the _____.

- A. angle of deviation

- B. magnetic declination
- C. magnetic meridian
- D. angle of dip

15. Calculate the force acting on an electron of charge $1.6 \times 10^{-19} \text{ C}$ placed in an electric field of intensity 10^8 Vm^{-1}

- A. $1.6 \times 10^{-14} \text{ N}$
- B. $1.6 \times 10^{-11} \text{ N}$
- C. $1.6 \times 10^{-13} \text{ N}$
- D. $1.0 \times 10^{-16} \text{ N}$

ANSWERS TO 2014/2015 PHYSICS QUESTIONS

**1. A 2. B 3. D 4. B 5. A 6. C 7. B
8. B 9. C 10. C 11. C 12. B 13. B
14. D 15. B**

EBSU 2015/2016 PHYSICS QUESTIONS

1. Which of the following is the most suitable for use as an altimeter?

- A. A mercury barometer
- B. A fortin barometer
- C. A mercury manometer
- D. An aneroid barometer

2. A body of weight W N rest on a smooth plane inclined at an angle θ° to the horizontal. What is the resolved part of the weight in newtons along the plane?

- A. $W \sin \theta$
- B. $W \cos \theta$
- C. $W \sec \theta$
- D. $W \tan \theta$

3. A small metal ball is thrown vertically upwards from the top of a tower with an initial velocity of 20ms^{-1} . If the ball took a total of 5s to reach ground level, determine the height of the tower.

- A. 60m
- B. 80 m
- C. 100m
- D. 120m

4. An object moves with uniform speed round a circle. Its acceleration has_____.

- A. constant magnitude and constant direction
- B. constant magnitude and varying direction
- C. varying magnitude and constant direction
- D. varying magnitude and varying direction

5. A wheel and axle have radii 80cm and 10cm respectively. If the efficiency of the machine is 0.85, and applied force of 120N to the wheel will raise a load of_____.

- A. 8.0N
- B. 6.8N
- C. 8160.0N
- D. 9600.0N

6. In which of the following is surface tension important?

- A. The floating of a ship in water
- B. The floating of a dry needle in water
- C. The floating of a balloon in air
- D. The diffusion of sugar solution across a membrane

7. A thermometer with an arbitrary scale, S , of equal division registers steam point, calculate the Celsius temperature corresponding to 60°C .

- A. 25.0°C
- B. 50.0°C
- C. 66.7°C
- D. 75.0°C

8. How long does it take a 750W theatre to raise the temperature of 1kg of water from 20°C to 50°C ?

[specific heat capacity of water = $4200\text{Jkg}^{-1}\text{K}^{-1}$]

- A. 84 sec

B. 112 sec

C. 168 sec

D. 280 sec

9. The saturated vapour of a liquid increases as the_____.

- A. Volume of the liquid increases
- B. Volume of the liquid decreases
- C. Temperature of the liquid increases
- D. Temperature of the liquid decreases

10. The absolute temperature of the perfect gas is proportional to the average_____.

- A. potential energy of the molecules
- B. separation between molecules
- C. kinetic energy of the molecules
- D. velocity of the molecules

11. A room is heated by means of a charcoal fire. An occupant of the room standing away from the fire is warmed mainly by_____.

- A. convection
- B. radiation
- C. conduction
- D. refraction

12. Which of the following is true of sound and light waves?

- A. They both transmit energy
- B. They both need a medium for propagation
- C. They are both transverse waves
- D. Their velocities in air are equal

13. The image in a pinhole camera is_____.

- A. erect and formed by refraction through the lens
- B. virtual and formed by dispersion
- C. erect and gets sharper as the hole becomes larger
- D. inverted and formed by the light from each point travelling in a straight line

14. Which of the following obeys Ohm's law?

- A. glass
- B. diode
- C. All electrolytes
- D. All metals

15. An equipment whose power is 1500W and resistance is 375 ohms would draw current of_____.

- A. 0.10A
- B. 2.00A
- C. 4.00A
- D. 77.5A

ANSWERS TO 2015/2016 PHYSICS QUESTIONS

**1. D 2. A 3. A 4. A 5. C 6. D 7. D
8. C 9. C 10. C 11. B 12. A 13. D
14. D 15. B**

EBSU 2009/2010 CHEMISTRY QUESTIONS

1. What is the shape of a molecule of CCl_4 ?

- A. Pyramid
- B. Tetrahedral
- C. Trigonal planar
- D. Linear

2. A sample of a gas with in initial volume of 2.5 dm^3 is heated and then allowed to expand to 7.5 dm^3 at constant pressure. What is the ratio of the final temperature of the initial absolute temperature?

- A. 3:1
- B. 1:3
- C. 2:5
- D. 5:2

3. 6g of Mg was added to 100 cm^3 of $1 \text{ /dm}^{-3} \text{ H}_2\text{SO}_4$. What of Mg remained undissolved? {Mg=24}

- A. 0.24g
- B. 2.4g
- C. 3.6g
- D. 0.36g

4. Which of the following will act as both oxidizing agent and reducing agent?

- A. H_2S
- B. NH_3
- C. Cl_2
- D. SO_2

5. A metal which can be used as sacrificial anode for preventing corrosion of a length of iron pipe is_____.

- A. copper
- B. magnesium
- C. silver
- D. lead

6. Which of the following as boiling water changes to steam?

- A. temperature of the system
- B. degree of disorder of the steam
- C. number of molecules
- D. activation energy

7. Which of the following is stable to heat?

- A. NaHCO_3
- B. $(\text{NH}_4)_2\text{SO}_4$
- C. AgNO_3
- D. K_2CO_3

8. Which of the following will precipitate in diluted HCL?

- A. ZnS
- B. Na_2S
- C. FeS
- D. CuS

9. Which of the following does NOT contain aluminium as a component?

- A. over-head cables
- B. duralumin
- C. container for caustic soda
- D. container for trioxonitrate (V) acid

10. The removal of rust from iron by _____ treatment _____ with

tetraoxosulphate (VI) acid is based on the_____.

- A. hydrolysis of the iron
- B. reaction of acid with base
- C. oxidation of the rust
- D. dehydration of the iron

ANSWERS TO 2009/2010 CHEMISTRY QUESTIONS

1. B 2. A 3. C 4. D 5. B 6. B 7. D
8. D 9. C 10. C

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EBSU 2012/2013 CHEMISTRY QUESTIONS

1. Which of the following constitutes a mixture?

- I. Petroleum
- II. Rubber Latex
- III. Vulcanizers solution
- IV. Carbon (II) sulphides

- A. I,II and III
- B. I,II and IV
- C. I and II only
- D. I and IV

2. 30cm^3 of oxygen at 10 atmosphere pressure is placed in a 20dm^3 container. Calculate the new pressure if temperature is kept constant.

- A. 6.7 atm
- B. 15.0 atm
- C. 6.0 atm
- D. 66.0 atm

3. A sample of gas exerts a pressure of 8.2 atm when confined in a 2.93dm^3 container at

20°C . The number of moles of gas in the sample is_____.

- A. 1.00
- B. 2.00
- C. 3.00
- D. 4.00

4. A quantity of air was passed through a weighed amount of alkaline pyrogallol. An increase in weight of the pyrogallol would result from the absorption of_____.

- A. nitrogen
- B. neon
- C. argon
- D. oxygen

5. There is a large temperature interval between the melting point and the boiling point of a metal because_____.

- A. metals have very high melting points
- B. metal conduct heat very rapidly

C. melting does not break the metallic bond but boiling does
D. the crystal lattice of metals is easily

6. Copper(II) tetraoxosulphate (IV) is widely used as a_____.

- A. fertilizer
- B. fungicide
- C. disinfectant
- D. purifier

7. Which of the following substances is not a homogeneous mixture?

- A. Filtered sea water
- B. Soft drink
- C. Flood water
- D. Writing ink

8. Ethene when passed into concentrated H_2SO_4 is rapidly absorbed. The product is diluted with water and then warmed to produce_____.

- A. ethanol

B. diethyl ether

C. ethanol

D. dimethyl sulphate

9. A certain liquid has a high boiling point. It is viscous, nontoxic, miscible with water to be hygroscopic. This liquid is most likely to be_____.

- A. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
- B. $\text{CH}_3\text{CH}_2\text{OHCH}_3$
- C. $\text{CH}_3\text{CH}_2\text{CHOHCH}_3$
- D. $\text{CH}_3\text{OHCHOCH}_2\text{OH}$

10. Which of the following statements is TRUE of the complete hydrolysis of a glyceride by sodium hydroxide?

- A. 3 moles of NaOH are required for each mole of glyceride
- B. 3 moles of glycerol are produced
- C. only one mole of soap is formed
- D. concentrated H_2SO_4 is essential for the completion of the reaction

11. A piece of radioactive element has initially 8.0×10^{22} atoms. Half-life is two days. After 16 days, the number of atom is_____.

- A. 5×10^{21}
- B. 5×10^{22}
- C. 2×10^{22}
- D. 2×10^{21}

12. Chlorine is a common bleaching agent. The is not true with_____.

- A. wet litmus paper
- B. printer's ink
- C. wet pawpaw leaf
- D. most wet fabric dyes

13. Calcium forms complexes with ammonia because_____.

- A. it is a transition metal
- B. it is an s-block element
- C. it has empty d-orbital
- D. it forms colourless compounds

14. The IUPAC name for $\text{ClCH}_2\text{-CH}_2\text{-CH}_2\text{OH}$ is _____.

- A. 1-chloropropen-3-ol
- B. 3-chloropropan-1-ol
- C. 1-chloropropanol
- D. 3-chloropropanol

15. An organic compound decolourized acidified KMnO_4 solution but failed to react with ammoniacal AgNO_3 solution. The organic compound is likely to_____.

- A. a carboxylic acid
- B. alkane
- C. alkene
- D. alkyne

ANSWERS TO 2012/2013 CHEMISTRY QUESTIONS

**1. D 2. – 3. A 4. D 5. C 6. B 7. C
8. A 9. D 10. A 11. - 12. B 13. B
14. B 15. D**

EBSU 2013/2014 CHEMISTRY QUESTIONS

1. A certain volume of a gas at 298K is heated such that its volume and pressure are now four times the original values. What is the new temperature?

- A. 18.6K
- B. 100.0K
- C. 298.0K
- D. 1192.0K
- E. 4768.0K

2. The boiling points of water, ethanol, toluene and butan-2-ol are 373.0K, 351.3K, 383.6 K and 372.5 K respectively. Which liquid has the highest vapour pressure at 323.0K?

- A. water
- B. toluene
- C. ethanol
- D. Butan-2-ol
- E. None

3. The function of sulphur during the vulcanization of rubber is to_____.

A. act as catalyst for the polymerization of rubber molecules

B. convert rubber from thermosetting to thermoplastic polymer

C. from chains which bind rubber molecules together

D. break down rubber polymer molecule

E. shorten the chain length of rubber polymer

4. Complete hydrogenation of ethyne yields

A. benzene

B. methane

C. ethane

D. ethene

E. propane

5. Mixing of aqueous solution of barium hydroxide and sodium tetraoxocarbonate (IV) yields a white precipitate of_____.

A. barium oxide

- B. sodium tetraoxocarbonate
- C. sodium oxide
- D. sodium hydroxide
- E. barium tetraoxocarbonate

6. An organic compound decolorized acidified KMnO_4 solution but failed to react with ammonium silver nitrate solution. The organic compound is likely to be_____.

- A. carboxylic acid
- B. an alkane
- C. an alkene
- D. an alkyne
- E. an alkenone

7. Which of the following conducts electricity?

- A. sulphur
- B. graphite
- C. diamond
- D. red phosphorus
- E. yellow phosphorous

8. Which of the following compounds is NOT the correct product formed when the parent metal is heated in air?

- A. calcium oxide(CaO)
- B. sodium oxide(Na_2O)
- C. copper(II)oxide(CuO)
- D. Tri-iron tetroxide(Fe_3O)
- E. Aluminium oxide(Al_2O_3)

9. When marble is heated to 1473K , another whiter solid is obtained which reacts vigorously with water to give an alkaline solution. The solution contains _____.

- A. NaOH
- B. KOH
- C. $\text{Mg}(\text{OH})_2$
- D. $\text{Zn}(\text{OH})_2$
- E. $\text{Ca}(\text{OH})_2$

10. Which of the following roles does sodium chloride play in soap preparation?

- A. reacts with glycerol

- B. purifies the soap
- C. accelerates the decomposition of the fat and oil
- D. separates the soap from the glycerol
- E. converts the fat acid to its sodium salt

11. Which of the following is used as a moderator to control nuclear fission?

- A. Lead
- B. Heavy water
- C. Iron
- D. Chromium

12. One of the active components of baking powder is_____.

- A. MgSO_4
- B. NaHCO_3
- C. CaSO_4
- D. NaCl

13. H_2SO_4 is used to remove rust on the surface of iron (pickling) before electroplating. The type of reaction involved is_____.

- A. redox reaction
- B. neutralization
- C. double decomposition
- D. hydrolysis

14. Silver chloride turns grey when exposed to sunlight because_____.

- A. the silver ion is reduced to silver
- B. the silver ion is oxidized to silver
- C. silver is a transition metal
- D. the silver chloride forms complexes in the sun

15. Which of these compounds exhibit resonance?

- A. benzene
- B. ethanol
- C. propene
- D. butyne

ANSWERS TO 2013/2014 CHEMISTRY QUESTIONS

1. E 2. C 3. B 4. D 5. E 6. D 7. B
8. D 9. E 10. D 11. B 12. B 13. A
14. A 15. A

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EBSU 2014/2015 CHEMISTRY QUESTIONS

1. When a solid substance disappears completely as a gas on heating, the substance is said to have undergone_____.

- A. evaporation
- B. distillation
- C. crystallization
- D. sublimation

2. A chemical reaction is always associated with_____.

- A. an increase in the composition of one of the substances
- B. a change in the volume of the reactants
- C. A change in the nature of the reactants
- D. The formation of new substances

3. According to Charles's law, the volume of a gas becomes zero at_____.

- A. 0°C
- B. -100°C

C. -273°C

D. -373°C

4. It is difficult to achieve an orderly arrangement of the molecules of a gas because they_____.

- A. have no definite shape
- B. have little force of attraction between them
- C. can collide with one another in the container
- D. are too small in size

5. An electron can be added to a halogen atom to form a halide ion with_____.

- A. 2 valence electrons
- B. 3 valence electrons
- C. 7 valence electrons
- D. 8 valence electrons

6. The property of Chlorine which causes hydrogen chloride to be more ionic than the chlorine molecules are its_____.

- A. electron valency
- B. electron affinity
- C. electron positivity
- D. electron negativity

7. Which of the following hydrogen halides has the highest entropy value?

- A. HF
- B. HCl
- C. HBr
- D. HI

8. Which of these compounds is a normal salt?

- A. NaHS
- B. NaHSO₄
- C. NaHCO₃
- D. Na₂CO₃

9. The allotrope of carbon used in the decolourization of sugar is_____.

- A. graphite
- B. soot
- C. charcoal

D. lampblack

10. Which of the following gases can be collected by the method of downward delivery?

- A. chlorine
- B. oxygen
- C. ammonia
- D. hydrogen

11. Sulphur (IV)oxide bleaches by _____.

- A. Reduction
- B. Oxidation
- C. Hydration
- D. Absorption

12. Aluminium hydroxide is used in the dyeing industry as a_____.

- A. salt
- B. dye
- C. mordant
- D. dispersant

13. Alloys are best prepared by_____.

- A. electroplating
- B. arc-welding
- C. reducing a mixture of this metallic oxides
- D. cooling a molten mixture of the metals

14. In the electrolysis of brine, the anode is_____.

- A. platinum
- B. copper
- C. zinc
- D. Carbon

15. Oxyacetylene flame is used for iron-welding because it_____.

- A. makes the iron metal solidify very quickly
- B. combines with oxygen to give a prop sound
- C. evolves a lot of heat when burnt
- D. dissociation to produce carbon (IV) oxide and oxygen

ANSWERS TO 2014/2015 CHEMISTRY QUESTIONS

**1. D 2. D 3. C 4. B 5. D 6. D 7. B
8. D 9 D 10. A 11. A 12. C 13.
14. D 15. C**

EBSU 2015/2016 CHEMISTRY QUESTIONS

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- C. crystallization
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ANSWERS TO 2015/2016 CHEMISTRY QUESTIONS

1. D 2. D 3. C 4. B 5. D 6. D 7. B
8. D 9. D 10. A 11. A 12. C 13.
14. D 15. C

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EBSU 2009/2010 BIOLOGY QUESTIONS

1. In the angiosperms, the sieve tube members are living non-nucleated, but they are usually accompanied by_____.

- A. Cork cambium
- B. Phloem rays
- C. Vascular cambium
- D. Companion cells

2. Absciscic acid is a chemical that prepares plants for_____.

- A. ripening fruits
- B. emergence of seedlings
- C. for leaf fall
- D. reproduction

3. In any population, any specific allele will mutate at one time or another, usually to a non-functional or harmful form. The proportion of gametes carrying new mutant alleles of a given locus is called_____.

- A. the mutation rate
- B. the selection coefficient

- C. the relative fitness
- D. the lethal genotype

4. In Mosses, the sporophyte generation is highly prominent producing spores in a cone like_____.

- A. Gametophyte
- B. Strobilus
- C. Antheridium
- D. Archegonium

5. When osmotic acid is boiled with a solution of food substances, it gave a colour black precipitate showing the presence of ____.

- A. fats and oil
- B. proteins
- C. amino acids
- D. starch

6. Plants adapted to life in salty march are known as_____.

- A. Hydrophytes

- B. Xerophytes
- C. Halophytes
- D. Epiphytes

7. A circulatory system that does not allow mixing of oxygenated and deoxygenated blood in the mammalian heart is referred to as_____.

- A. open
- B. haemocoelic
- C. single
- D. closed

8. In a pyramid of numbers, it is common to have- with the smallest of individuals_____.

- A. secondary consumers
- B. tertiary consumers
- C. primary consumers
- D. primary producers

9. One of these animal groups contain acoelomate members.

- A. Mollusca
- B. Coelenterate

- C. Arthropoda
- D. Reptilia

10. A flower that has both stamen and pistil is said to be_____.

- A. perfect
- B. imperfect
- C. pistillate
- D. staminate

ANSWERS TO 2009/2010 BIOLOGY QUESTIONS

**1. D 2. C 3. D 4. B 5. A 6. C 7. D
8. B 9. B 10. A**

EBSU 2012/2013 BIOLOGY QUESTIONS

1. Sting cells are normally found in_____.

- A. flatworms
- B. hydra
- C. snails
- D. paramecium

2. The annulus of fern sporangium helps in_____.

- A. spore dispersal
- B. conduction of mineral salt
- C. trapping of light energy
- D. water retention

3. The respiratory organ in the land snail is the_____.

- A. radula
- B. mantle
- C. tentacle
- D. foot

4. The gill rakers of fishes take part in_____.

- A. feeding

B. respiration

C. swimming

D. diffusion

5. The element common to protein, carbohydrate and lipid is_____.

- A. hydrogen
- B. sulphur
- C. nitrogen
- D. phosphorus

6. Which of the following is a plant excretory product?

- A. Oil
- B. Cytokinin
- C. resin
- D. amino acids

7. Epigeal germination can be found in_____.

- A. sorghum
- B. maize
- C. millet
- D. groundnut

8. Which of following characters is NOT sex-linked?

- A. River blindness
- B. Baldness
- C. Haemophilia
- D. Colour Blindness

9. Which of the following diseases can be prevented by inoculation?

- A. Syphilis
- B. Malaria fever
- C. Tuberculosis
- D. Acquired Immune Deficiency Syndrome

10. Nitrogen-fixing micro-organisms in leguminous plants live symbiotically in the_____.

- A. root nodules
- B. tap roots
- C. branch roots
- D. root hairs

11. Frogs and toads are classified together in the Vertebrate class_____

- A. Aves
- B. Reptilia
- C. Amphibia
- D. Mammalia

12. Blood clotting is helped by_____.

- A. Na^+
- B. K^+
- C. Ca^{2+}
- D. Mg^{2+}

13. On storage, the sweetness of corn is lost. This is because _____.

- A. polysaccharide is reconverted into soluble sugar
- B. concentration of sugar increases due to storage
- C. conversion of sugars to polysaccharide
- D. Enzymes responsible for conversion are destroyed

14. One of these arthropods is a carrier of viruses and other micro-organisms.

- A. Termite
- B. Ant
- C. Bee
- D. Flea

15. The enzyme responsible for curling of milk in infants is called_____.

- A. pepsin
- B. renin
- C. trypsin
- D. urease

ANSWERS TO 2012/2013 BIOLOGY QUESTIONS

**1. B 2. A 3. B 4. A 5. A 6. C 7. D
8. A 9. C 10. A 11. C 12. C 13. A
14. D 15. B**

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EBSU 2013/2014 BIOLOGY QUESTIONS

1. In mammals, the function of the sebaceous gland is to ____.

- A. produce sweat
- B. secrete sodium
- C. secrete water
- D. produce an oily substance
- E. manufacture vitamin

2. Movements and positions of the head in man are detected by the ____.

- A. cochlea
- B. malleus
- C. Utriculus
- D. semi-circular canals
- E. outer

3. The maize grain is a fruit and not a seed because it ____.

- A. has a large endosperm
- B. is formed from an ovary
- C. is a monocotyledon
- D. has no plumule and radical
- E. has a hypogeal germination

4. The characters by which an organism is recognized are termed ____.

- A. phenotype
- B. genotype
- C. morphology
- D. anatomy
- E. physiology

5. Germination which results in the cotyledons being brought above ground is called ____.

- A. hypocotyls
- B. epicotyl
- C. epigeal
- D. Hypogeal
- E. plumule

6. In a mammal, stimulus is transferred from the receptor muscle to the central nervous system through the ____.

- A. motor neurons
- B. effector muscle
- C. dendrites

D. sensory neurons

E. synapses

7. Which of the following food chains is the correct sequence?

A. Weeds → Tadpoles → Beetles → Fish-Man

B. Weeds → Tadpoles → Fish → Beetles → Man

C. Tadpoles → Beetles → Tadpoles → Weeds

D. Man → Fish → Beetles → Tadpoles → Weeds → Tadpoles

8. The primary and secondary hosts respectively of bilharzia are_____.

A. fish and man

B. man and dog

C. snail and man

D. man and snail

E. fish and snail

9. The origin of mineral particles in the seed in_____.

A. humus

B. water

C. micro-organisms

D. weathered rock

E. organic matter

10. The initial volume of water poured in bag of dry soil was 50ml and the amount that drained through was 35ml. The percentage water content of the fully soak soil is therefore_____.

A. 46.7

B. 25.0

C. 20.0

D. 30.0

E. 58.3

11. From the following list of types of mutation, identify the one that is not hereditary.

A. Genetic mutation

B. Somatic mutation

C. Germinal mutation

D. Gametic mutation

12. In a cell, digestive enzymes mostly occur in _____.

- A. ribosomes
- B. lysosomes
- C. mitochondria
- D. plastids

13. Which of the following habitats form the highest diversity of living species?

- A. Tropical rain forests
- B. Savannah grassland
- C. Desert
- D. Tropical forests

14. Lack of protein in the diet of children manifest easily because_____.

- A. children do not store up protein efficiently
- B. It is difficult for the children to chew meat
- C. protein supplies energy to the body
- D. protein is responsible for growth and repairs

15. Growth response of a plant to a light gradient is known as_____.

- A. nastic movement
- B. geotropism
- C. hydrotropism
- D. phototropism

ANSWERS TO 2013/2014 BIOLOGY QUESTIONS

**1. D 2. D 3. B 4. A 5. C 6. D 7. B
8. D 9. E 10. D 11. B 12. B 13. A
14. D 15. D**

EBSU 2014/2015 BIOLOGY QUESTIONS

1. The organelle involved in tissue respiration is the_____.

- A. Endoplasmic reticulum
- B. Ribosome
- C. Golgi body
- D. Mitochondrion

2. A tissue can best be defined as_____.

- A. An aggregate of similar cells
- B. An aggregate of cells performing similar function
- C. An aggregate of similar cells performing the same function
- D. A mixture of different cell types performing the same function

3. A major different between platyhelminthes and coelenterates is that platyhelminthes_____.

- A. are multicellular
- B. have developed mesoderm
- C. reproduce sexually
- D. reproduce asexually

4. The essential structural difference between Hydra and tapeworm is that while Hydra_____.

- A. has tentacles, tapeworm is parasitic
- B. is diploblastic, tapeworm is triploblastic
- C. has a mouth, tapeworm feeds by suckers
- D. has mesoderm tapeworm has mesoglea

5. The flowering period of plants in a habitat is determined by the_____.

- A. duration of sunlight
- B. intensity and duration of rainfall
- C. relative humidity of the atmosphere
- D. temperature of the habitat

6. An onion is a bulb because it_____.

- A. has a tuberous stem

B. has a reduced stem and thick fleshy leaves

C. has adventitious root

D. bears many buds at the nodes

7. The flow of air and water in or out of the mesophyll is controlled by the_____.

A. stomata

B. lenticels

C. air spaces

D. guard cells

8. Fungi are heterotypic because they_____.

A. have no leaves

B. lack roots

C. are filamentous

D. lack chlorophyll

9. The major site of photosynthesis in the leaf is the_____.

A. Palisade parenchyma

B. Mesophyll parenchyma

C. Upper epidermis

D. Lower epidermis

10. 5cm³ dilute sodium hydroxide solution and 5cm³ one percent copper sulphate solutions are added to a solution of food specimen. The purple colour which is observed shows the presence of_____.

A. glucose

B. starch

C. fat

D. protein

11. The blood vessel which carries blood from the alimentary canal to the liver is the_____.

A. Hepatic artery

B. Hepatic vein

C. Hepatic portal vein

D. Mesenteric artery

12. In the absence of oxygen, the pyruvic acid produced during glycolysis is converted to CO² and_____.

- A. water
- B. glycerol
- C. ethanol
- D. citric acid

13. The excretory organ in insects is the_____.

- A. kidney
- B. Malpighian tubule
- C. flame cell
- D. nephridium

14. Nitrogen-fixing micro-organisms in leguminous plants live symbiotically in the_____.

- A. root nodules
- B. tap roots
- C. branch
- D. root hairs

15. The blood vessels which carries digested food from the small intestine to the liver is the_____.

- A. renal vein
- B. renal artery

- C. hepatic artery
- D. hepatic portal vein

ANSWERS TO 2014/2015 BIOLOGY QUESTIONS

**1. D 2. B 3. B 4. B 5. C 6. B 7. B
8. B 9. B 10. B 11. C 12. C 13. B
14. A 15. C**

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EBSU 2015/2016 BIOLOGY QUESTIONS

1. The organelle involved in tissue respiration is the_____.

- A. Endoplasmic reticulum
- B. Ribosome
- C. Golgi body
- D. Mitochondrion

2. A tissue can best be defined as_____.

- A. An aggregate of similar cells
- B. An aggregate of cells performing similar function
- C. An aggregate of similar cells performing the same function
- D. A mixture of different cell types performing the same function

3. A major different between platyhelminthes and coelenterates is that platyhelminthes_____.

- A. are multicellular
- B. have developed mesoderm
- C. reproduce sexually
- D. reproduce asexually

4. The essential structural difference between Hydra and tapeworm is that while Hydra_____.

- A. has tentacles, tapeworm is parasitic
- B. is diploblastic, tapeworm is triploblastic
- C. has a mouth, tapeworm feeds by suckers
- D. has mesoderm tapeworm has mesoglea

5. The flowering period of plants in a habitat is determined by the_____.

- A. duration of sunlight
- B. intensity and duration of rainfall
- C. relative humidity of the atmosphere
- D. temperature of the habitat

6. An onion is a bulb because it_____.

- A. has a tuberous stem

B. has a reduced stem and thick fleshy leaves

C. has adventitious root

D. bears many buds at the nodes

7. The flow of air and water in or out of the mesophyll is controlled by the_____.

A. stomata

B. lenticels

C. air spaces

D. guard cells

8. Fungi are heterotypic because they_____.

A. have no leaves

B. lack roots

C. are filamentous

D. lack chlorophyll

9. The major site of photosynthesis in the leaf is the_____.

A. Palisade parenchyma

B. Mesophyll parenchyma

C. Upper epidermis

D. Lower epidermis

10. 5cm³ dilute sodium hydroxide solution and 5cm³ one percent copper sulphate solutions are added to a solution of food specimen. The purple colour which is observed shows the presence of_____.

A. glucose

B. starch

C. fat

D. protein

11. The blood vessel which carries blood from the alimentary canal to the liver is the_____.

A. Hepatic artery

B. Hepatic vein

C. Hepatic portal vein

D. Mesenteric artery

12. In the absence of oxygen, the pyruvic acid produced during glycolysis is converted to CO₂ and_____.

- A. water
- B. glycerol
- C. ethanol
- D. citric acid

13. The excretory organ in insects is the_____.

- A. kidney
- B. Malpighian tubule
- C. flame cell
- D. nephridium

14. Nitrogen-fixing micro-organisms in leguminous plants live symbiotically in the_____.

- A. root nodules
- B. tap roots
- C. branch
- D. root hairs

15. The blood vessels which carries digested food from the small intestine to the liver is the_____.

- A. renal vein
- B. renal artery

- C. hepatic artery
- D. hepatic portal vein

ANSWERS TO 2015/2016 BIOLOGY QUESTIONS

**1. D 2. B 3. B 4. B 5. C 6. B 7. B
8. B 9. B 10. B 11. C 12. C 13. B
14. A 15. C**

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- **Update** this past question
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