HOME SCHOOLING MATERIAL

PASS O'LEVEL

BIOLOGY, PHYSICS AND ENGLISH
**BIOLOGY PAPER ONE QUESTIONS (OBIO0011)**

### SECTION A

1. During an experiment to investigate the percentage of water in a soil sample, a student used a method of 10g soil and 100g water and evaporated it slowly. After cooling, what was the percentage of water in the soil sample?
   - A. 20%
   - B. 10%
   - C. 25%
   - D. 2.5%

2. Which part of the mammalian eye regulates the amount of light that reaches the retina?
   - A. Cornea
   - B. Iris
   - C. Lens
   - D. Retina

3. Which of the following sets of activities occur during very low environmental temperature in mammals?
   - A. Shivering, vasodilation and skin hair being erect.
   - B. Vasodilation, shivering and sweating.
   - C. Vasodilation, vasodilation and shivering.
   - D. Vesiculation, vasodilation and shivering.

4. An egg is laid by a herring, a student observed that the herring laid many eggs together, and noted that the fertilized eggs are
   - A. Bony
   - B. Fish-like
   - C. Insect-like
   - D. None

5. Which of the following plants are propagated vegetatively using suckers?
   - A. Bananas
   - B. Carrots
   - C. Tomatoes
   - D. Maize

6. The components of blood include in human beings are:
   - A. Plasma and urine
   - B. Plasma and invited
   - C. Plasma and water
   - D. Plasma and mineral salts

7. Which of the following is necessary for dehiscence in dry weight of a seedling in the first 7 days of germination?
   - A. Hydrated cell
   - B. Hydrated cell and plasma
   - C. Hydrated cell and mineral salts
   - D. Hydrated cell and mineral water

8. Which of the following processes causes sudden change in the DNA of organisms?
   - A. Mutation
   - B. Hybridization
   - C. Evolvement
   - D. Specialization

9. The figure below shows treatment in a leaf before and after an experiment on photosynthesis.

   ![Photo of a leaf before and after treatment](image)

   What requirement of photosynthesis was being investigated in the experiment?
   - A. Chloplast
   - B. Light intensity
   - C. Water
   - D. Carbon dioxide concentration

10. Which of the following blood groups does not have antigens for
    - A. AB
    - B. A
    - C. 0
    - D. B

11. Which of the organisms below produces alcohol during anaerobic respiration?
    - A. Mammals
    - B. Arachnids
    - C. Insects
    - D. Tons

12. The main role of donating or fluctuating in the adrenals is
    - A. catalysis breakdown of carbohydrates and fatty acids.
    - B. physical breakdown synthesis of glucose.
    - C. breakdown large molecules of lipids in smaller droplets.
    - D. present a stable pH for digestion.

13. Which of the following explains the growth of lions into the ground?
    - A. bone only hydrolytic and epidermal
    - B. negatively hydrolytic and positively epidermal
    - C. bone only hydrolytic and epidermal
    - D. positively hydrolytic and negatively epidermal

14. In which of the following are the red blood cells of an adult human male
    - A. Eurostereon
    - B. Eurostereon
    - C. Hydrostereon
    - D. Eurostereon

15. To which of the following groups of animals do earthworms belong?
    - A. annelids
    - B. nematode
    - C. Pseudolophina
    - D. Echinodermata

16. The figure below shows a transverse section of a plant organ.

   ![Transverse section of a plant organ](image)

   What plant organ whose transverse section is shown above is
    - A. meristematic zone
    - B. meristematic zone
    - C. meristematic zone
    - D. meristematic zone

18. During which stage of growth and development in humans do changes that make one sexually mature occur?
    - A. Adolescence
    - B. Puberty
    - C. Childhood
    - D. Adulthood

19. Which mode of asexual reproduction involves an organism developing an ovum through a feeding from another organism
    - A. Hybridisation
    - B. Ovaembryogenesis
    - C. Ovaembryogeny
    - D. Ovaembryogeny

20. Which of the following occurs in the organic compounds as undigested food leaves the cell?
    - A. Glucose is removed
    - B. Lactose is added
    - C. The numbers remain unchanged
    - D. Some amino acids are absorbed

21. What are the principles of nutrition of an albino child if one parent is as well as another? The parent is
    - A. a carrier for albinism while the other is homozygous recessive for albinism
    - B. heterozygous for albinism while the other is also heterozygous for albinism
    - C. homozygous for non-albinism while the other is homozygous for albinism
    - D. heterozygous for albinism while the other is heterozygous for albinism

### Conclusion

Oxygen, water and warmth are necessary for germination.

### Question

- a. Abstraction from sexual intercourse.
  - b. Absorption from sexual intercourse.
  - c. Abstraction from sexual intercourse.
  - d. Absorption from sexual intercourse.

### Question

- a. Sweat ducts and vernix caseosa.
  - b. Sweat glands and vernix caseosa.
  - c. Sweat glands and vernix secretion.
  - d. Sweat ducts and vernix secretion.

### Question

- a. Fetal alcohol syndrome.
  - b. Fetal alcohol exposure.
  - c. Fetal alcohol syndrome.
  - d. Fetal alcohol exposure.

### Question

- a. Bony
  - b. Fish-like
  - c. Insect-like
  - d. None
PASS O'LEVEL

ENGLISH SOLUTIONS (O'LEVEL)

PAPER ONE

LETTER WRITING (LETTER OF COMPLAINT)

A letter of complaint is written annually when there is dissatisfaction about conditions, services, purchases, food, etc. It is written to authorities to take action to solve a prevailing problem.

A letter of complaint should contain the following:
1. Two or three sentences explaining the situation.
2. The facts.
3. A suggestion or remedy.
4. A reference or source.
5. Introduction, body, and conclusion with polite but firm language.
6. A caption or a question with a sentence to the effect that the writer is looking forward to hearing from the recipient.

You can use some of the expressions below:
1. Introductory remarks
2. Body
3. Conclusion
4. Suggestion or remedy
5. Reference or source
6. Description of the situation
7. Description of the facts
8. Description of the remedy
9. A request for action

SAMPLE OF A LETTER OF COMPLAINT

XYZ Secondary School,
PO Box 99,
Mabada

14th June, 2009

The Headmaster,
XYZ Secondary School
PO Box 99
Mabada

Dear Sir,

I am a student at XYZ Secondary School and I am writing to express my dissatisfaction about the current situation in the school.

Firstly, the facilities in the school are not satisfactory. The classrooms are overcrowded and the toilets are dirty. The food served in the canteen is not up to standard and it is not healthy. I believe that these issues need to be addressed as soon as possible.

Secondly, the teaching staff is not always helpful and they do not provide enough support to the students. The homework is too much and it is not balanced. I think that the school should reduce the workload and improve the quality of the teaching.

I am looking forward to hearing from you and I hope that you will take action to improve the situation in the school.

Yours sincerely,

Signature

Turn to page IV
SUMMARY WRITING

ROUGH COPY

THE BEST WAYS OF PREPARING FOR UCE ENGLISH

UCE English requires you to consolidate "three skills" - reading, listening and writing. Read in the careful, comprehending way teachers demand, with an eye to the style and context. Try to be discriminating, use your leisure hours to read a selection of books. Talk about what you have read, share your thoughts with others. How do you feel about the story? Discuss your exam syllabus and specimen papers to get ideas for coursework and extra practice material. Examine your own work and try to identify any weaknesses. Use the resources available to you.

FAIR COPY

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PAPER ONE

Section One is compulsory. Use 500-600 words.

1. During a football match between your school and another school, one of your team members gets a serious injury. He has to undergo an operation and is likely to be missing out of school for a long time. Write a letter to the school authority explaining the situation. Be sure to mention the medical advice given and the steps you will take to ensure the well-being of your team member.

2. Write a story about the time you were caught in a heavy storm and had to take shelter in a nearby house. Describe the atmosphere inside the house and how you spent the night. Also, write about how you felt when you finally managed to return home safely.

PAPER TWO

Section One is compulsory. Use 500-600 words.

1. Write a composition of 500-600 words about a real-life experience. You may choose a recent experience that has had a significant impact on your life. Describe the incident in detail, including the events leading up to it and the consequences that followed. Try to reflect on the lessons you learned from the experience and how it has changed you as a person.

2. Write an essay about the importance of education in today's world. Discuss the benefits of education and how it can help individuals achieve their goals. Also, consider the challenges faced by students in accessing education and propose solutions to overcome these challenges.
government's cost sharing policy for transferring patients from hospitals. Just a reminder that in the spirit of fact that such hospitals are poorly stocked with drugs and poorly equipped, the government spends more money on ministerial political log-ways abroad. He says that for every 250: 7500 with a degree in health services, about three of air ambulance pilots are being asked for air ambulance pilots to be qualified specialists. There is only one doctor for every 20,000 laboratories. The report suggests a huge increase in flu treatment for every 2,500 people, which means Tanzania must have a minimum of 4000 doctors.

Dr. Michael Kitia, Director General of the National Institute of Medical Research, says that the increase in doctors is due to the failure of patients to achieve the 100% prescription rate due to western medicine as soon as they go by get better.

Dr. Kitia says that he prescribes treatment for those who are not able to afford treatment. "The best way of curing common cold is to give them their medicine prescription, provision is done by the doctor.

Adapted from "The Montreal Neurological Hospital" by Alfredo Quinones, (in "Bersa-

1.5. What is the benefit of having a doctor in this area?

Question: In about 20 words, summarize the reasons why Tanzania runs away from hospitals in her Folk Hero.

2.9. Each passage carefully and then answer the questions that follow:

"I don't think my son Tobi is having his tooth pulled. Sure, he looks rather sick in his room. I must say, I have very short arms and I often find that the arms of a 10-year-old might be exposed to the considerably longer time. Still, he didn't mind his meals when he was eating his food. The best way of curing common cold is to give them their medicine prescription, provision is done by the doctor.

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PASS O'LEVEL

From page V
3.8. Do you think ______ the windows?
A. close
B. is close
C. closing
D. close closing

3.9. John you ate so slow. This project _______
A. expected before completed
B. should be completed
C. should have been completed
D. might have completed

3.10. The woman who was killed was carrying a bag.
A. brown big leather
B. big black leather
C. leather big brown
D. big brown leather

GRAMMAR EXTRA
Rewrite the following sentences:
1. The team is a strong competitor in the league.
   Strong competitor is in the league by the team.
2. They are the best players in the world.
   Best players in the world are they.
3. The book is interesting and informative.
   Interesting and informative is the book.
4. The movie was a huge success.
   Huge success was the movie.
5. The weather is very hot today.
   Very hot today is the weather.
6. The concert was a fantastic performance.
   Fantastic performance was the concert.
7. The experiment was a great success.
   Great success was the experiment.
8. The experiment failed completely.
   Completely failed was the experiment.
9. The experiment produced unexpected results.
   Unexpected results produced the experiment.

Choose the most correct alternative.
11. Which of the following is properly punctuated?
A. Go out, do you hear?
B. Go out, do you hear?
C. Go out, do you hear?
D. Go out, do you hear?

PHYSICS PAPER ONE SOLUTIONS CONTINUE (PHY009)

14. C
   Note that:
   (a) Basic particles are diatomic. Electrons are negatively charged particles of an atom.
   (b) Neutrons are neutral uncharged particles of an atom.

15. B
   Read about: The nature of images formed by curved mirrors.

16. B
   Notes: Field lines always run from the south pole to the north pole of the magnet and they never cross each other.

17. C
   Recall that the electrical power is given by
   \[ P = IV \]
   where \( I \) is the current and \( V \) is the voltage.

18. D
   Inertia is the reluctance of a body to start moving when it is at rest and to stop moving when it is in motion. The same phenomenon explains why a moving object continues to move in a straight line unless acted upon by an external force.

19. B
   All the above physical questions have a direct or indirect relationship with temperature.

20. C
   The C.R.O. has three major parts:
   - P1: Components
     - Electron gun
     - Electron detector
     - Beam-defining system
   - P2: Beam-defining screen
   - P3: Beam-defining screen

21. C
   The C.R.O. uses the different parts of the C.R.O. and the use of the C.R.O.

22. C
   Notes: Electricity is measured in amperes and sold in kilowatt hours (kWh). To obtain a kilowatt hour, multiply the kilowatt by hours for which the appliance has run. Use an electric rate of 1.5 kWh per 1000 watts.
   - Total usage: 104.25 x 1.5 kWh
   - 1 unit cost: 400
   - 2 units cost: 540
   - 3 units cost: 600
   - 4 units cost: 630
   - 5 units cost: 640

23. C
   Note: Sound waves are longitudinal. The molecules of the medium in motion in a direction parallel to that of travel of the wave.

24. D
   Use the formula:
   \[ f = \frac{v}{l} \]
   where \( f \) is the frequency and \( l \) is the length of the medium.

25. C
   Fundamental frequency:
   - \( f = 2500 \) Hz

26. A
   Speed = \( 2.5 \times 2.5 = 6.25 \text{ m/s} \)
   Time = \( 0.05 \text{ s} \)

27. C
   Notes: Semiconductor diodes are used in various electronic devices.

28. C
   Notes: Charging by induction involves the use of a magnetic field to induce a current in a conductor.

Applying the principle of moment of force, the moment of force is balanced (be in equilibrium), the sum of clockwise moments is equal to the sum of anti-clockwise moments.

The center of gravity of the object is the point where its weight is concentrated and since the object is uniform, its center of gravity is at 3m from the middle point.

29. C
   \[ \rho = \frac{m}{V} = \frac{600}{8} \rightarrow m = \rho \times V \]

30. C
   Notes: Force that affects liquid pressure and solid pressure.

31. B
   Notes: Energy conversion.

32. B
   Notes: Work-energy theorem.

33. B
   Notes: Work done on a body is defined as the product of force and the displacement of the point of application of the force.

34. A
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

35. A
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

36. C
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

37. C
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

38. C
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

39. C
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.

40. C
   Notes: Radiation is a form of energy that can be transmitted through space without the need for a medium.
37. A) Read above: The electromagnetic spectrum

38. B) Read above: Mechanical waves

39. B) Period is the time it takes to complete a cycle. Frequency is the number of complete cycles in a second and is the reciprocal of period. $T = \frac{1}{f}$, $f = \frac{1}{T} = 0.51 \text{ Hz} \rightarrow 0.02 \text{ sec}

Alternative answer:
Speed, $v = \frac{\text{distance}}{\text{time}} = 0.08 = 0.003 \text{ m/s}$

40. C) Read above: The relative change in wave length and velocity of water waves as they travel from deeper water to shallower water and vice versa.

**Notes:** During a sea breeze, the land is heated and the air above it expands, becomes less dense and rises upwards. The cool dense air above the sea moves towards the land and replaces the warm air that rose up. This happens during day time.

SECTION B

41. a) Thermal basic

42. a) Secondary cells are cells that can’t be recharged by passing a current through them from another source once they stop working or when they release on the amount of current being supplied. In the secondary cells, current is produced as a result of reversible chemical change taking place within the cell.

Examples of alkaline battery included:
- Nickel - cadmium (NiCd cells)
- Nickel - Iron (NiFe cells)

43. a) It means that Gibbs was 1600 years old to decay to half its original mass.

b) "Gibbs is one of the pioneers of U. It is a measure of the random motion of the individual molecules in a system."

i) Composition of Sn.
Sn has atomic number (number of protons) = 50, number of neutrons = 56 and atomic mass = 109.

ii) Energy changes that occur during charging a phone.
Electrical energy $\rightarrow$ chemical energy $\rightarrow$ heat.

You’re converting electrical energy from the wall outlets into chemical energy inside the battery, plus a bit of wasted heat energy, since battery charging is not 100% efficient.

iii) The power of the house.
Given:
Mass, $m = 1500 \text{ kg}$
Distance, $d = 1 \text{ km} = 1000 \text{ m}$
Time, $t = 40 \text{ minutes} = 40 \times 60 = 2400 \text{ s}$

Using power = work done $\div$ time, time taken = work done $\div$ power.

- Energy $= 1500 \times 1000 = 1.5 \times 10^9 \text{ J}$
- $P = \frac{W}{t} = \frac{1.5 \times 10^9}{2400} = 0.625 \times 10^9 \text{ W}$

iv) Secondary energy sources include resources that have been converted or stored. Secondary sources cannot be harnessed directly from nature. These include:
- electricity generated from primary fuels like natural gas
- fuel cells,
- petrels, etc.

Note: Primary energy sources consist of unconverted or original fuels. These include: natural gas, petroleum, coal, minerals, flowing water wind and solar radiation. These are forms that can be harnessed, extracted or harnessed directly.

44. a) Given:
- $E_1 = 1 \text{ V}$
- $E_2 = 1 \text{ V}$

Since the positive terminals are connected to each and the negative terminals are also connected to each other, then the cells are in parallel combination. And also since the cells have different voltages, which affect the current by interaction.

Note: If the cells were of the same EMF, then their effective would be the same value of one cell. So, effective EMF $E_{eff} = E_1 + E_2 = 1.5 \text{ V}$

**Effective internal resistance**

- $r = \frac{E_{eff}}{I}$
- $r = \frac{1.5}{0.3} = 5 \text{ ohms}$

(b) Given:
- $V = 4 \text{ V}$
- $N_1 = 500 \text{ turns}$

Using $V = N_2 E_2 F_2$

- $E_2 = \frac{V}{N_2 F_2}$
- $F_2 = \frac{V}{E_2 N_2}$
- $E_2 = \frac{4}{500 \times 2} = 0.8 \text{ V}$

- $F_2 = \frac{4}{0.8 \times 500} = 0.01 \text{ mW}$

45. a) Given:
- $f_1 = 5 \text{ Hz}$
- $f_2 = 1 \text{ Hz}$

Since frequencies are different, then the coils cannot be in parallel combination.

b) Given:
- $V = 40 \text{ V}$
- $N_1 = 800 \text{ turns}$

Using $V = N_2 E_2 F_2$

- $E_2 = \frac{V}{N_2 F_2}$
- $F_2 = \frac{V}{E_2 N_2}$
- $E_2 = \frac{40}{800 \times 2} = 0.1 \text{ V}$

(c) A) Primary coil

b) Given:
- $V = 60 \text{ V}$
- $N_1 = 500 \text{ turns}$

Using $V = N_2 E_2 F_2$

- $E_2 = \frac{V}{N_2 F_2}$
- $F_2 = \frac{V}{E_2 N_2}$
- $E_2 = \frac{60}{500 \times 2} = 0.06 \text{ V}$

Note: However, when a hot liquid is kept in the vacuum flask for a long time, it cooks because at a small rate, heat is lost by conduction, convection and radiation.
PASS O'LEVEL

PHYSICS PAPER TWO QUESTIONS (OPHYO0010)

1. (a) Define uniform velocity. 
(b) A ball of mass 500g is thrown vertically upwards from the ground with a velocity of 20m/s, calculate the: (i) Maximum height attained. (ii) Potential energy gained at the maximum height. 
(c) Define Pressure. (i) Explain why one feels more pain when picked by a pin than a nail. 
(d) Define Momentum. 
(e) State Newton's second law of motion. 
(f) A steel ball of mass 2kg is thrown with 80m/s and the body accelerates from 10m/s to 50m/s in 5s. Find the magnitude of the force. 

2. (a) What is meant by the term condensation as applied to liquid. 
(b) A compound is made by joining a copper rod and a wooden rod. A piece of paper is wrapped several times around the joint. The compound rod is passed through a Bunsen flame several times. Explain what is observed. 
(c) The graph below shows the change of temperature of water/Alcohol heated from 40°C to 100°C in 16 minutes. Explain the features of the graph. 

3. (a) Measure the following quantities into rulers and vectors: 
(b) Thrusts of 10N, 15N, and 20N act on a body of mass 250g. 
(c) Magnitude of the resultant force on A, acceleration of A. 

4. (a) State the principle of conservation of momentum. 
(b) Explain briefly what happens when the neck of a inflated balloon is suddenly opened. 
(c) What is meant by terminal velocity? 

5. (a) Define the following terms as applied to waves: 
(b) Wave length 
(c) State three differences between light and sound waves. 

6. (a) Define the following terms as used in chemistry: 
(b) Combustion 
(c) Conductor 
(d) Resistance 

7. (a) Define a hard magnetic substance and a soft magnetic substance. 
(b) Give one example of each of the above substances. 
(c) Sketch magnetic field lines for a bar magnet with the pole facing each other and one is to explain the nature of the points. 

8. (a) What is meant by the following: 
(b) Radioscopes 
(c) Radiometer 

9. (a) A steel ball has a half life of 50 minutes, if the initial count rate is 652 per minute. 
(b) What fraction of the original number of atoms decay in this time? 
(c) What are cathode rays? 
(d) Describe briefly how cathode rays are produced in a cathode ray tube. 
(e) What are X-rays? 

10. (a) Define the following: 
(b) Ultraviolet radiation 
(c) X-rays