**2018 Integrated Science Past Questions – Paper One**

1. The space occupied by matter is its  
A. area  
B. mass  
C. volume  
D. weight

2. Which of the following structures contain cellulose?  
A. Cell wall  
B. Cell membrane  
C. Chloroplast  
D. Mitochondrion

3. Which of the following activities are cultural practices used in tomato cultivation?  
I. Pest control  
II. Pricking out  
III. Fertilizer application

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

4. The farming system that makes effective use of available soil nutrients in a growing season is  
A. crop rotation  
B. land rotation  
C. mixed cropping  
D. mixed farming

5. Which of the following members in a food chain will receive the least energy?  
A. Lizard  
B. Grass  
C. Grasshopper  
D. Hawk

6. Digestion of fats and oils in humans starts in the  
A. colon  
B. gullet  
C. mouth  
D. duodenum

7. What is the chemical symbol for silver?  
A. Ag  
B. Au  
C. Si  
D. S

8. The process by which gas changes to liquid is known as  
A. melting  
B. evaporation  
C. condensation  
D. boiling

9. Which of the following substances is acidic?  
A. Wood ash  
B. Salt-petre  
C. Bee stings  
D. Bicarbonate of soda

10. The basic unit of life is the  
A. cell  
B. nucleus  
C. organ  
D. tissue

11. Useful materials in food that provide growth and repair of worn out tissues are called  
A. carbohydrates  
B. vitamins  
C. proteins  
D. fats

12. In human reproduction, the sperm fertilizes the female egg to form the  
A. zygote  
B. follicle  
C. ovary  
D. ovum

Use the information below to answer questions 13 to 15

A solid X reacted with a liquid Y to form a salt and water only. A portion of liquid Y turned blue litmus paper red. Solid X did not dissolve when a portion of it was placed in water and stirred.

13. Solid X could be said to be  
A. an acid  
B. an alkali  
C. a base  
D. a salt

14. Liquid Y is  
A. an acid  
B. an alkali  
C. a base  
D. a metal

15. If red litmus paper is placed in liquid Y, the colour of the paper will  
A. remain the same  
B. change to blue  
C. change to purple  
D. become brighter

16. The type of soil which becomes water-logged after rainfall is made up of a large amount of  
A. silt  
B. sand  
C. gravel  
D. clay

17. Ringworm is a disease which attacks the  
A. skin  
B. lungs  
C. liver  
D. kidneys

18. The most appropriate practice to adopt when growing vegetables in the dry season is  
A. watering  
B. transplanting  
C. pest control  
D. fertilizer application

19. Which of the following organisms improves soil fertility?  
A. Caterpillar  
B. Millipede  
C. Nematode  
D. Rat

20. The introduction of natural enemies to control pests on a field is a  
A. physical control method  
B. cultural control method  
C. chemical control method  
D. biological control method

21. A body has a density of 30 g cm–3 and volume of 6 cm3. Determine the mass of the body.  
A. 180.0 g  
B. 24.0 g  
C. 5.0 g  
D. 0.2 g

22. The force which tends to pull an object in a circular motion towards the centre of the circle is called  
A. centripetal force  
B. electrostatic force  
C. gravitational force  
D. magnetic force

23. The swollen shoot disease of cocoa is caused by  
A. fungus  
B. virus  
C. bacteria  
D. protozoa

24. The instrument used to measure atmospheric pressure is called  
A. a thermometer  
B. a force meter  
C. a barometer  
D. an anemometer

25. The systematic name of NO2 is  
A. nitrogen oxide  
B. nitrogen (I) oxide  
C. nitrogen (II) oxide  
D. nitrogen (IV) oxide

26. Which of the following simple machines is a second class lever?  
A. Bottle top opener  
B. Claw hammer  
C. Fishing rod  
D. Pair of pliers

27. A cylindrical metal has radius 7 cm and height 2cm. Determine the volume of the cylinder. [Take π = 22/7]  
A. 44 cm3  
B. 107 cm3  
C. 308 cm3  
D. 1078 cm3

28. Which of the following statements are true of compounds?  
I. They are homogenous  
II. Their constituents are present in fixed ratio by mass  
III. Their constituents keep their individual properties

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

29. Which of the following factors contribute to early parenthood?  
I. Illiteracy  
II. Poverty  
III. Peer pressure  
IV. Lack of parental care

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

30. Which of the following statements about the negative use of Science and Technology is correct? It  
A. promotes good health  
B. promotes easy communication  
C. enable humans to use less energy in working  
D. creates things that are dangerous to the environment

31. Which of the following nutrients is needed by plants in small quantities?  
A. Calcium  
B. Iron  
C. Potassium  
D. Magnesium

32. Which of the following statements about shadow formation is correct? It shows that light rays can  
A. be diffused  
B. travel in a straight line  
C. be refracted  
D. be reflected

33. The colour of the neutral wire in an electrical circuit is  
A. blue  
B. brown  
C. green  
D. yellow

34. A metal displaces 5.0 cm3 of water when it is totally immersed. If the mass of the metal is 35.0 g, calculate its density  
A. 7.0 g cm–3  
B. 30.0 cm–3  
C. 40.0 cm–3  
D. 175.0 cm–3

35. Which of the following physical properties of water are correct? Water  
I. is a colourless liquid  
II. is a universal solvent  
III. boils at 100°C at standard atmospheric pressure  
IV. has a density of 5 kg cm–3 at 4°C

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

36. The relative proportions of the different particle sizes in a soil sample refer to soil  
A. temperature  
B. texture  
C. structure  
D. porosity

37. Which of the following chemical equations is balanced?  
A. K + O2 → K2O  
B. Mg + O2 → MgO  
C. Na + Cl2 → NaCl  
D. H2 + Cl2 → 2HCl

38. Heat is transferred along an iron bar by  
A. absorption  
B. conduction  
C. convection  
D. radiation

39. The second stage in the life of a mosquito is the  
A. egg  
B. imago  
C. larva  
D. pupa

40. The function of the platelets in the circulatory system of humans is to  
A. transport oxygen  
B. transport carbon dioxide  
C. defend the body  
D. clot the blood

**Objective Answers**

1. C. volume

2. A. cell wall

3. D. I, II and III

4. C. mixed cropping

5. B. Grass

6. D. duodenum

7. A. Ag

8. C. condensation

9. C. Bee stings

10. A. cell

11. C. proteins

12. A. zygote

13. C. a base

14. A. an acid

15. A. remain the same

16. D. clay

17. A. skin

18. A. watering

19. B. Millipede

20. D. biological control method

21. A. 180.0 g

22. A. centripetal force

23. B. virus

24. C. a barometer

25. D. nitrogen (IV) oxide

26. A. Bottle top opener

27. C. 308 cm3

28. A. I and II only

29. D. I, II, III and IV

30. D. creates things that are dangerous to the environment

31. B. Iron

32. B. travel in a straight line

33. A. blue

34. A. 7.0 g cm–3

35. C. I, II and III only

36. B. texture

37. D. H2 + Cl2 → 2HCl

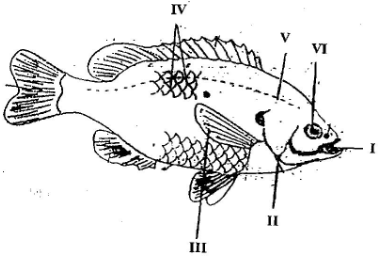
38. B. conduction

39. C. larva

40. D. clot the blood

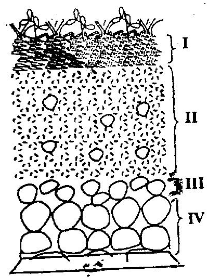
**2018 Integrated Science Past Questions – Paper Two**

1. (a) The diagram below is an illustration of a fish  
Study the diagram carefully and answer the questions that follow



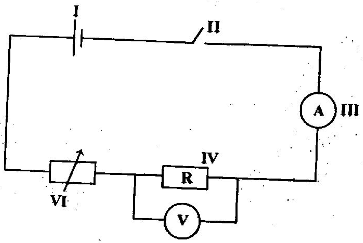
(i) Identify the fish  
(ii) Name each of the parts labelled I, II, IV, V  
(iii) Name the habitat of the fish  
(iv) Explain how each of the parts labelled III and VI enables the fish adapt to its habitat.

 (b) The diagram below is an illustration of a section through the soil.  
Study the diagram carefully and answer the questions that follow.



(i) What does the diagram represent?  
(ii) Name each of the parts labelled I, II, III, IV  
(iii) Which part of the diagram:  
(α) is the richest in humus?  
(β) is the habitat for soil organisms?  
(γ) undergoes weathering?  
(iv) What is the effect of heavy rainfall on the part labelled I?

(c) The diagram below is an illustration of an electrical circuit.  
Study the circuit and answer the questions that follow.



(i) Name each of the parts labelled I, II, IV, VI  
(ii) State the energy transformation that takes place in:  
(α) I  
(β) IV  
(iii) State the S.I. units of the quantity measured by each of the parts labelled  
(α) III  
(β) V  
(iv) State the function of the part labelled VI

(d) In an experiment, equal volumes and equal concentrations of dilute hydrochloric acid and dilute sodium hydroxide solutions were each placed in different test tubes.  
Read the following statements carefully  
I. Both red and blue litmus papers were dipped into each of the solutions in turns.  
II. Equal volumes of the solutions were mixed to obtain a third solution.

III. Both red and blue litmus papers were dipped into the third solution.

Use the information provided to answer the following questions.

(i) Explain briefly how you can identify each of the solutions.  
(α) Hydrochloric acid;  
(β) Sodium hydroxide.  
(ii) State the type of reaction that occurred when the two solutions were mixed.  
(iii) What type of solution was formed when the reaction stated in (ii) occurred?  
(iv) State what would be observed when both red and blue litmus papers were dipped into the third solution.  
(v) Explain how the solid portion of the solution named in (iii) could be obtained.

2. (a) (i) What is an ion?  
(ii) State two methods of softening hard water.

(b) (i) Differentiate between pests and parasites as used in agriculture.  
(ii) Give an example each of a:  
(α) pest;  
(β) parasite

(c) (i) What is work?  
(ii) A force of 10 N causes a body to move a distance of 5.2 m in the direction of the force. Calculate the work done.

(d) Name two diseases associated with the circulatory system of humans

3. (a) (i) What is malnutrition?  
(ii) State one symptom each of the following deficiency disease:  
(α) scurvy;  
(β) rickets.

(b) Draw the potassium atom and show the distribution of electrons in its shells.  
[K = 19]

(c) (i) Define potential energy  
(ii) An object of mass 10 kg is moving at a velocity of 2 ms–1 .  
Calculate the kinetic energy of the object

(d) State one example each of :  
(i) macro nutrients;  
(ii) micro nutrients.

4. (a) (i) Explain the term hazard.  
(ii) List two safety precautions against hazards in the teaching and learning of science.

(b) In a tabular form state three differences between osmosis and diffusion.

(c) (i) What is weather?  
(ii) State two differences between weather and season.

(d) (i) What is a fertile soil?  
(ii) State two factors that cause loss of soil fertility.

5. (a) (i) What is a magnetic field?  
(ii) Name two methods of making magnets

(b) Explain briefly the term teenage pregnancy

(c) Write the formula for each of the following compounds:  
(i) calcium chloride;  
(ii) copper (I) oxide;  
(iii) nitrogen (IV) oxide;  
(iv) ammonia

(d) (i) List three physical properties of soil.  
(ii) What is the texture of clayey soil?

6. (a) (i) What are derived quantities?  
(ii) State the S.I. units of the following quantities:  
(α) area;  
(β) volume.

(b) (i) State two factors necessary for photosynthesis  
(ii) Explain the functions of each of the factors stated in (i)

(c) Explain each of the following terms:  
(i) soft water;  
(ii) hard water.

(d) State three reasons why some seeds are nursed.

# Answers

1 (i)  
• Bony fish  
• Tilapia

(ii)  
I – mouth  
II – gill cover / operculum  
IV – scales  
V – lateral line

(iii)  
• Fresh water  
• river  
• lake  
• fish pond  
• lagoon  
• brackish water

(iv)  
III – used for  
• swimming  
• movement  
• pitching

IV – used for wide vision / seeing

b (i) Soil Profile

(ii) I – Top soil / humus  
II – Sub-soil  
III – weathered rock / material  
IV – parent rock / unweathered rock / bedrock / rock layer

(iii) (α) I / top soil

(β) I / top soil

(γ) II – Sub-soil  
III – weathered rock / material  
IV – parent rock / unweathered rock / bedrock / rock layer

(iv)  
♣ leaching  
♣ erosion

c. (i)  
I – cell  
II – key / switch  
IV – resistor  
V – rheostat / variable resistor / resistance box

(ii) (α) I – chemical energy to electrical energy  
(β) IV – electrical energy to heat energy

(iii) State the S.I. units of the quantity measured by each of the parts labelled  
(α) III – ampere / amperes / A  
(β) V – volt / volts / V

(iv) ♣ It is used to regulate current  
♣ It is used to control current  
♣ It is used to vary current

d. (i)(α) Hydrochloric acid – It turns blue litmus paper to red  
(β) Sodium hydroxide – It turns red litmus paper to blue

(ii) Neutralization reaction

(iii) Salt solution OR Sodium chloride solution

(iv) There would be no change in the colours of the red and blue litmus papers  
OR  
There would be no effect on both the red and blue litmus papers  
OR  
Red litmus paper remains red, and blue litmus paper remains blue

(v) Pour the solution into a suitable container and evaporate / allow to dry / heat the solution dryness

2. (a) (i) ♣ A charged atom  
♣ A charged group of bonded atoms  
♣ An atom that has lost or gained electron(s)  
♣ A group of bonded atoms that has lost or gained electron(s)

(ii)  
♣ Distillation  
♣ Boiling  
♣ Adding washing soda / sodium carbonate (Na2CO3)  
♣ Deionization  
♣ Using ion exchange resin

(b) (i)

|  |  |
| --- | --- |
| PEST | PARASITE |
| Any organism that causes damage to crops or animals | A living organism that lives on the surface or inside the body of another living organism/host and gets its food from it and thereby causes harm to the host |

(ii)(α) pest

♣ rats,  
♣ bats  
♣ houseflies,  
♣ cockroaches,  
♣ mice,  
♣ fleas,  
♣ etc

(β)

♣ worms (tapeworm, hookworm, fluke, roundworm etc),  
♣ arthropods /insects (tick, louse, flea, etc),  
♣ protozoa (plasmodium, etc)  
♣ etc

(c) (i) Work is done when a force moves a body through a given distance in the direction of the force.  
OR  
Work is the product of force and the distance moved in the direction of the force.  
OR  
Work = f × d,  
where f = force; and d = distance moved in the direction of the force.

(ii)  
Work done = force × distance  
= 10 × 5.2  
= 52 joules or 52 J

(d) ♣ hypertension  
♣ hypotension  
♣ haemorrhoids (piles)  
♣ arteriosclerosis  
♣ etc

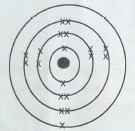
3. (a) (i)  
A condition that occurs when a person is not obtaining enough food nutrients  
OR  
A condition that results from eating a diet in which nutrients are either not enough / are too much such that the diet causes health problems  
OR  
A lack of proper nutrition caused by not eating enough of the right food  
OR  
A condition which occurs when there is a deficiency of certain vital nutrients in a person’s diet  
OR  
A condition caused by lack of a balanced diet and therefore lacking essential food nutrients.

(ii) (α) scurvy

♣ bleeding gums  
♣ weakness  
♣ bruising  
♣ fatigue  
♣ rashes

(β) rickets

♣ bow legs  
♣ poor bone formation  
♣ delayed growth  
♣ pain in the spine

(b)  


(c) (i)  
It is the energy possessed by a body due to its relative position  
OR  
The energy a body possesses as a result of its position relative to others

(ii)  
Kinetic energy = ½ mv2 , where m = mass of body; and v = velocity  
= ½ × 10 × 22  
= ½ × 10 × 2 × 2  
= 20 joules or 20 J

(d)  
(i) macro nutrients;

♣ Nitrogen / N  
♣ Phosphorus / P  
♣ Potassium / K  
♣ Calcium / Ca  
♣ Magnesium / Mg  
♣ Sodium / Na

(ii) micro nutrients.

♣ Copper / Cu  
♣ Zinc / Zn  
♣ Molybdenum / Mo  
♣ Iron / Fe  
♣ Boron / B  
♣ Cobalt / Co

4. (a) (i) Hazard is a danger / risk that could result in physical harm to people or damage to property  
OR  
A source of potential damage / harm / adverse health effect on something or someone

(ii) ♣ wearing protective clothing / boots / goggles  
♣ routine maintenance of equipment  
♣ closing all taps before leaving the laboratory  
♣ switching off all electrical points  
♣ mounting hazard signs of dos and don’ts in the laboratory / working area  
– etc

(b)

|  |  |
| --- | --- |
| **Osmosis** | **Diffusion** |
| Movement of water molecules only | Movement of any particle / chemical substance |
| Requires a semi-permeable membrane | Does not require a semi-permeable membrane |
| Moves from a dilute solution to concentrated solution | Moves from a concentrated region to a less concentrated region |
| Occurs in liquids only | Occurs in both liquids and gases / fluids |

(c) (i)  
It is the atmospheric conditions at a place over a short period of time  
OR  
It is the day to day conditions / changes of the atmosphere / environment  
OR  
It is the state of the atmosphere / environment describing the day to day temperature, humidity, cloud cover , atmospheric pressure, wind or precipitation activity.

(ii)

|  |  |
| --- | --- |
| **Weather** | **Season** |
| Changes daily / in a few hours | Lasts for about 3 or 4 months |
| Caused by atmospheric conditions | Caused by the revolution of the earth |
| Relatively short termed | Relatively long termed |
| Covers relatively smaller areas | Covers relatively larger area |
| Does not influence plants or animal habitat | Influences plant or animal habitat |
| Not influenced by distance from the sun | Influenced by distance from sun |
| Measurable | Not measurable |

(d) (i)  
A soil that has sufficient/adequate plant nutrients to support healthy plant growth  
OR  
A soil that has all major nutrients for plant nutrition and others to support plant growth  
OR  
A soil that is able to provide all essential plant nutrients in available forms for the healthy growth of plants

(ii)

♣ Removal of top soil by erosion  
♣ Removal of nutrients by crops / depletion / nutrient mining  
♣ Sand winning / physical degradation of soil / poor soil structure / water logging / compaction, etc  
♣ Decreased soil bioactivity  
♣ Soil acidification / salinization / alkalization  
♣ leaching  
♣ overcropping  
♣ overgrazing  
♣ erosion  
♣ excessive burning / bush burning / wildfires /  
♣ Indiscriminate use of agrochemicals / soil pollution  
♣ inefficient soil management practices  
♣ etc

5. (a) (i)It is a region / area around a magnet within which the magnetic force can be felt  
OR  
It is an area around a moving electric charge within which the force of magnetism acts

(ii) ♣ Induction  
♣ Stroking  
♣ The use of electricity  
♣ Hammering / hitting

(b)  
When a girl under the age of 20 years conceives / takes seed.  
OR  
When a female person below 20 years gets pregnant

(c)

(i) calcium chloride; – CaCl2  
(ii) copper (I) oxide; – Cu2O  
(iii) nitrogen (IV) oxide; – NO2  
(iv) ammonia – NH3

(d) (i)

♣ texture  
♣ structure  
♣ temperature  
♣ colour  
♣ strength / consistence  
♣ permeability  
♣ water  
♣ air  
♣ porosity  
♣ drainage  
♣ capillarity  
♣ organism

(ii)  
♣ It is smooth /  
♣ It is slippery / sticky when wet.

It is a region / area around a magnet within which the magnetic force can be felt  
OR  
It is an area around a moving electric charge within which the force of magnetism acts

6. (a) (i) They are quantities which are combination / multiples / ratios of base / fundamental quantities.

(ii)(α) area – m2 / square metre  
(β) volume. – m3 / cubic metre  
[Note: metre square or metre cube is wrong]

(b) (i) ♣ sunlight  
♣ chlorophyll  
♣ carbon dioxide  
♣ water

(ii)

Chlorophyll –  
♣ Absorbs sunlight  
♣ Traps light

Sunlight –  
♣ Provides energy /  
♣ Separates the hydrogen and oxygen atoms of water

Water –  
♣ Raw material  
♣ Combines with carbon dioxide to produce food  
♣ Splits into oxygen, hydrogen ions and electrons to replace the host electrons

Carbon dioxide –  
♣ Raw material  
♣ Used in splitting water  
♣ Reduced to sugar

(c)  
(i) soft water;  
♣ It is water that lathers easily / readily with soap  
♣ It is water that does not contain Ca or Mg ions / salts  
♣ It is water that contains negligible quantities of Ca2+ or Mg2+

(ii) hard water.  
♣ It is water that does not lather easily with soap  
♣ It is water that contains Ca or Mg ions / salts  
♣ It is water that contains Ca2+ or Mg2+

(d)

(i) some seeds are unable to withstand adverse weather conditions  
(ii) provides favorable growth conditions  
(iii) better protection / care for seedlings  
(iv) enables selection of healthy seedlings  
(v) some seeds need special treatment to enhance germination / better germination  
(vi) eliminates problems of unfavorable soil conditions  
(vii) easy control of weeds  
(viii) reduces field management cost  
(ix) improves crop growth uniformity  
(x) nursed seeds provide higher yield