**HOLIDAY WORK**

**BIOLOGY S.2**

**TIME: 2 ½ HOURS**

**INSTRUCTIONS**

* Attempt all questions.
1. Which of the following characteristics is **not** true for all living things?
2. They locomote C. They grow
3. They respire D. They excrete
4. Which of the following cells does not contain chlorophyll?
5. Spongy mesophyll cells C. Guard cells
6. Epidermal cells D. Palisade cells
7. Arachnids have;
8. Three pairs of legs C. No antennae
9. Three main body parts D. Two pairs of antennae
10. Organisms with a round body which is pointed at both ends are termed as;
11. Arachnids C. Platyhelminthesis
12. Nematodes D. Annelids
13. Which of the following organisms belongs to Pteridophytes?
14. Conifers B. Monocots C. Ferns D. Toad stools.
15. Monocots have;
16. Tap roots B. Parallel veins C. Adventitious roots D. Petioles

1. The eggs of a house fly hatch within
2. 2 days B. 1 week C. 2 weeks D. 24 hours.
3. A cockroach is said to be male if has
4. Anal cercus B. Podical plates C. Ootheca D. Styles
5. Plants that grow on others plants for support are called.
6. Xerophytes B. Halophytes C. Hydrophytes D. Epiphytes
7. Axillary buds are found at…..
8. The top of a flowering plant C. At the root tip
9. The axil of a flowering plant D. At the shoot tip
10. ………..are short cornical underground stems with buds and scale leaves
11. Bulbs B. Corns C. Rhizomes D. Runners
12. The leaf arrangement shown in the diagram below is;
13. Opposite
14. Decussate
15. Apposite
16. Whorled
17. Plants bearing staminate and pistillate flowers borne on the plant are called
18. Hermaphrodite B. Monoecius C. Unisexual D. Dioecius
19. Which of the following is a dry dehiscent fruit?
20. Follicle B. Achene C. Nut D. Caryopsis
21. The fruit shown below is A
22. Cypsela
23. Samara
24. Nut
25. Caryopsis
26. In an experiment to determine the percentage of air in soil, the following results were recorded

 Volume of soil in measuring cylinder = 50cm3

 Volume of water in measuring cylinder = 50cm3

 Volume of soil and water mixture after mixing = 85cm3

The percentage of air in the soil is

1. 58.8% B. 85% C. 17.6% D. 30%
2. Which of the following soil has the highest capillarity?
3. Clay soil B. Sandy soil C. loam soil D. silty soil.
4. Which of the following enzymes catalyses hydrolysos of a substance to its final product?
5. Lipase B. Pepsin C. Trypsin D. Salivary amylase
6. Which of the following elements is important in the formation of chlorophyll?
7. Magnesium B. Nitrogen C. Calcium D. Zinc
8. Which of the following organisms has carnassial teeth
9. Crocodile B. Elephant C. Wart hog D. Cat
10. The muscle controlling the passage of food from the stomach to the duodenum is called
11. Pyrolic splinctes C. Cardiac sphinctes
12. Oesophagus D. Gall bladder
13. Which of the following chambers of the ruminant’s stomach contains enzymes secreted by the alimentary canal?
14. Omasum B. Reticulum C. Abomasum D. Rumen
15. The liquid form of food in the duodenum is known as …….
16. Chyme B. Gastric juice C. Succus entericus D. Chyle
17. Which of the following enzymes are found in the same region?
18. Ptyalin and lipase C. Trypsin and trypsin
19. Pepsin and trypsin D. Amylase and maltose
20. Ruminants have bacteria in their stomach’s because
21. They don’t have enough teeth in their jaws
22. They produce a lot of gas
23. They eat dirty grass
24. They don’t have enzymes to digest cellulose
25. Translocation of food in plants is done by;
26. Xylem vessels C. Sieve tubes
27. Tracheids D. Companion cells
28. When tasting for starch, a leaf from methylated spirit is dipped in hot water in order to;
29. Kill the protoplasm C. To soften the leaf
30. Burst the starch grains D. To make it permeable to iodine
31. When a cell loses water by osmosis it

A. Becomes turgid C. Bursts

1. Becomes plasmolysed D. Becomes hypotonic
2. Premature leaf fall in plants is likely to be a deficiency of ….
3. Phosphorous B. Magnesium C. Nitrogen D. Zinc
4. The dental formula given below was found in a small wild animal Z

I $\frac{3}{3}$ , C $\frac{1}{1}$ , Pm $\frac{4}{4}$ , M $\frac{2}{3}$ how many teeth are in the jaws of animal Z

1. 21 B. 42 C. 84 D. 62

**SECTION: B**

1. The table below shows the amount of product formed from a substance per min when an enzyme is used at different pH.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| pH | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
| Amount of substrate formed (g/min) | 0 | 0 | 7 | 12 | 7 | 0 | 0 |

1. Plot the above results on s graph ( 8 mks)
2. Describe the shape of the graph ( 4 mks)

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1. Explain the shapes of the graph ( 4 mks)

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1. Suggest a region of the human alimentary canal from which the enzyme is likely to be found ( 1 mk)

…………………………………………………………………………………………

1. A part from pH, mention 3 factors affecting enzyme activity ( 3 mks)
2. ……………………………………………………………................................
3. …………………………………………………………………………………..
4. …………………………………………………………………………………..
5. You are provided with specimen A and B use them to answer the questions that follow.
6. With a reason, identify the specimens ( 2 mks)
7. Specimen A: ……………………………………………………………………….

Reason ……………………………………………………………………………….

 ………………………………………………………………………………………..

ii) Specimen B ……………………………………………………………………….

 Reason …………………………………………………………………………….

 ……………………………………………………………………………………...

1. Explain how the following features make the ileum a good site for absorption of food.

 (4 mks)

1. It has many blood capillaries

………………………………………………………………………………………

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1. It has many villi

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1. The villi have lacteals.

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1. Has many mitochondria

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b) Complete the table below

|  |  |  |  |
| --- | --- | --- | --- |
| **Enzyme** | **Region of alimentary canal** | **Substrate** | **End product** |
| Pepsin |  |  |  |
| Ptyalin |  |  |  |
| Trypsin |  |  |  |
| Erepsin |  |  |  |

**SECTION: C**

1. Describe eight functions of the liver in a mammalian body (15 mks)
2. a) Define the term photosynthesis (2 mks)

b) Describe an experiment to show that carbon dioxide is necessary for photosynthesis

(13 mks

NAME ……………………………………………………………….. STREAM ……………

INDEX NUMBER: ………………………………………………………………

553/1

Biology

Paper 1

Time 2 hours 30 minutes

ST. JOSEPH’S SENIOR SECONDARY SCHOOL NAGGALAMA

**END OF TERM TWO EXAMINATIONS 2017**

 **S.2 BIOLOGY PAPER 1**

 **TIME: 2 HOURS 30 MINUTES**

**INSTRUCTIONS**

* This paper consists of three sections A, B and C
* Answer all questions in section A and B plus two questions from section C
* Write the answers to section A in the box grind provided below.

 **SECTION A**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. |  | 11. |  | 21. |  |
| 2. |  | 12. |  | 22. |  |
| 3. |  | 13. |  | 23. |  |
| 4. |  | 14. |  | 24. |  |
| 5. |  | 15. |  | 25. |  |
| 6. |  | 16. |  | 26. |  |
| 7. |  | 17. |  | 27. |  |
| 8. |  | 18. |  | 28. |  |
| 9. |  | 19. |  | 29. |  |
| 10. |  | 20. |  | 30. |  |

1. Which of the following elements is necessary for formation of chlorophyll?
2. Magnesium C. Potassium
3. Manganese D. Phosphorous
4. A type of heterotrophic nutrition in which organism feed on organic material obtained from the body of another organism is;
5. Holozoic nutrition C. Saprophytic nutrition
6. Parasitic nutrition D. Phagocytosis
7. The following are dental formulae of different animals. Which belongs to a cow?
8. I $\frac{2}{2}$ , C $\frac{1}{1}$ , P, $\frac{2}{2}$ M $\frac{2}{2}$ C. I $\frac{3}{3}$ , C $\frac{1}{1}$ , P $\frac{4}{4}$ , M $\frac{2}{3}$
9. I $\frac{2}{1}$ , C $\frac{0}{0}$ , P, $\frac{3}{2}$ M $\frac{3}{3}$ D. I $\frac{0}{3}$ , C $\frac{0}{1}$ , P, $\frac{3}{3}$ M $\frac{3}{3}$
10. The summary of the equation for the process of photosynthesis is as follows below. Which set represents raw materials for the process?

 6CO2(g) + 6H2O(l) C6H12O6(aq) + 6O2(s)

1. CO2 and H2O C. CO2 and C6H12O6
2. C6H12O6 and O2 D. CO2 and O2
3. In locusts the most destructive stage to vegetation is the;
4. Larva B. Pupa C. Imago D. Eggs
5. Which of the following hormones is responsible for the conversion of glucose to glycogen?
6. Secretin C. Adrenalin
7. Glucagon D. Insulin
8. Which of the following pairs of insects undergo incomplete metamorphosis?
9. Housefly and mosquito C. Cockroach and grasshopper
10. Honey bee and moth D. Butterfly and cockroach
11. Which adaptation of flowering plants can promote cross pollination?
12. Ripening of anthers and stigma at the same time
13. Self-sterility of the same flowers
14. Flowers being covered by a polythene bag
15. Flowers bearing both male and female organs.
16. Termites are able to eat wood because;
17. They digest only small pieces C. Microscopic fungi live in their guts
18. They produce cellulose enzymes D. They possess strong mandibles.
19. A microscope with an eye piece of x5 gave a magnification of x 40. The size of the objective lense used is;
20. X 50 B. X 8 C. X 45 D. X 35
21. Water moves across the cortex of the root to the endodermis by means of
22. Capillarity C. Active transport
23. Cohension D. Osmosis
24. Which one of the following structures is necessary in the dispersal of seeds and fruits by water?
25. Tough testa B. Hairs C. Dry testa D. Wings
26. Gastric juice in the alimentary canal is secreted by:
27. Duodenum B. Pancreas C. Ileum D. Stomach
28. The disease condition called goitre is related to;
29. Adrenaline C. Thyroxine
30. Pancreas D. Insulin
31. Which of the following can cause transpiration to increase?
32. Increasing humidity C. Reducing on humidity
33. Increasing oxygen supply D. Increasing the carbon dioxide supply
34. Which of these is true about the tap root system?
35. All roots are the same size C. Roots originate from a common point
36. Has lateral roots D. Has adventitious roots
37. The animals that chew curd are specifically called?
38. Herbivores C. Reticulate
39. Non- ruminants D. Ruminants
40. Which of the following is a berry?
41. Mango fruit C. Bean pod
42. Apple fruit D. Orange fruit
43. Which term is used to describe the lock and key fit that takes place between a molecule of an enzyme and its substrate?
44. Specific B. Optimum C. Synthetic D. Hypothesis
45. The following reagents are used to test for food substance;
46. Iodine solution
47. Copper (II) sulphate solution
48. Dilute hydrochloric acid
49. Dilute sodium hydroxide solution

Which of the above can be used to test for proteins?

1. (i) and (iii) C. (ii) and (iv)
2. (i) and (iv) D. (ii) only
3. Which of the following enzymes convert starch to maltose and maltose to glucose respectively?
4. Amylase, lactose C. Amylase, catalase
5. Amylase, maltose D. Amylase maltose
6. Which one of the following structural adaptations of leaves is important for light absorption during photosynthesis?
7. Dense network of veins
8. Large numbers of stomata on leaf surface
9. Large intercellular air spaces in the spongy layer
10. Broad and flat surface of leaves.
11. The following conditions are all a result of deficiency of vitamins of the B group except
12. Night blindness C. Pellagra
13. Beriberi D. Pernicious anaemia
14. Worker bees are;
15. Sterile males developed from unfertilised eggs.
16. Sterile females developed from unfertilised eggs
17. Fertile males developed from unfertilised eggs
18. Fertile females developed from unfertilised eggs.
19. Which one of sequences represents a correct life cycle of the insect?
20. Egg maggot adult housefly
21. Egg caterpillar nymph adult butterfly
22. Egg nymph adult cockroach
23. Egg worm adult termite
24. Which one of the following elements is a micro nutrient?
25. Copper B. Magnesium C. Calcium D. Sulphur
26. In an experiment to determine the percentage of water in a soil sample, the following results were obtained ;

Mass of fresh soil = 220g

Mass of soil after heating to constant weight = 198g

What was the percentage of water content in the fresh soil?

1. 10% B. 20% C. 80% D. 90%
2. A ……………is an achene – like fruit in which the pericarp and seed coat have become fused together.
3. Nut B. Cypsela C. Samara D. Caryopsis
4. To which one of the following groups of plants do ferns belong?
5. Conifers C. Pteridophytes
6. Bryophytes D. Angiosperms.
7. The movement of reducing sugar molecules across the visking tube to distilled water in a beaker is,
8. Osmosis C. Active transport
9. Diffusion D. Pinocytosis

 **SECTION B**

***Attempt all numbers in this section.***

 **Answers to this section must be written in the spaces provided.**

1. An experiment was carried out to investigate the effect of temperature on the activity of enzyme catalase. The results are shown in the table below

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Temp (0C) | 0 | 15 | 25 | 35 | 45 | 50 | 65 | 75 |
| Time taken to evolve 10cm3 of oxygen (second) | 0 | 40 | 20 | 05 | 20 | 40 | 80 | 0 |
| Rate of oxygen release (cm2s–1) | 0 |  |  |  |  |  |  |  |

1. (i) Complete the table by calculating the rate of oxygen release. (3 ½ mks)

 (ii) Using the information in the table. Plot a graph to show the relationship between temperature and the rate of reaction of catalase enzyme. (08 mks)

1. (i) Describe the shape of the graph (03 ½ mks)

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(ii) Explain the shape of the graph (03 mks)

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(iii) State 3 other factors that may affect the activity of catalase apart from that under investigation (03 mks)

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1. An experiment was carried out to investigate whether light is a factor necessary for photosynthesis. The following steps were carried out. Explain the importance of the following procedures.
2. (i) A potted plant is placed in darkness for 48 hours (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

(ii) After 48 hours, one leaf from the plant is removed and an iodine test carried out on it. (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

(iii) One leaf from this plant has its lower and upper surfaces covered with an

 aluminium foil. (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

(iv) One leaf from this plant has its lower and upper surface covered with a transparent sheet. (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. The plant set up is exposed to sunlight for 3 hours (02 mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Briefly describe how a leaf from (a) above is tested for the presence of starch.

 (08 mks)

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1. (a) Define the following terms
2. Ingestion (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Assimilation (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Dental formula (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

 (b) In the space below, write the dental formula of man starting with Incisors (I),

 Canines(C), Premolars (P) and Molars (M). (04 mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

(ii) State two function of incisors in the mammals jaw bone. (02 mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

 **SECTION C (30 MARKS)**

 ***Attempt only 2 questions from this section.***

 **Answers to this section must be written on the answer sheets provided.**

1. (a) State and describe the role played by enzymes in the following parts of the alimentary canal.
2. Duodenum (05 mks)
3. Ileum (06 mks)

(b) How is the ileum adapted for absorption of food in the alimentary canal? (04 mks)

1. (a) What is dispersal? (01 mk)

(b) Describe how the different dry fruits are dispersed. (14 mks)

1. (a) S.2 South student was given a colourless soft drink rich in non-reducing sugar and vitamin C. Describe the test carried out by the student and observations made to confirm for the presence of these nutrients. (10 mks)

(b) State the functions of the following nutrients in the diet.

 (i) Water (03 mks)

 (ii) Proteins (02 mks)

1. (a) Define the following terms
2. Metamorphosis (01 mk)
3. Parasitic nutrition (01 mk)

 (b) (i) Without diagrams, describe the life cycle of a housefly (11 mks)

 (ii) State two economic importance of a housefly to man (02 mks)

 **END.**

NAME ……………………………………………………………….. STREAM ……………

INDEX NUMBER: ………………………………………………………………

553/1

Biology

Paper 1

Time 2 hours 30 minutes

ST. JOSEPH’S SENIOR SECONDARY SCHOOL NAGGALAMA

 **S.2 BIOLOGY PAPER 1**

 **TIME: 2 HOURS 30 MINUTES**

**INSTRUCTIONS**

* This paper consists of three sections A, B and C
* Answer all questions in section A and B plus two questions from section C
* Write the answers to section A in the box grind provided below.

 **SECTION A**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. |  | 11. |  | 21. |  |
| 2. |  | 12. |  | 22. |  |
| 3. |  | 13. |  | 23. |  |
| 4. |  | 14. |  | 24. |  |
| 5. |  | 15. |  | 25. |  |
| 6. |  | 16. |  | 26. |  |
| 7. |  | 17. |  | 27. |  |
| 8. |  | 18. |  | 28. |  |
| 9. |  | 19. |  | 29. |  |
| 10. |  | 20. |  | 30. |  |

1. Which of the following elements is necessary for formation of chlorophyll?
2. Magnesium C. Potassium
3. Manganese D. Phosphorous
4. A type of heterotrophic nutrition in which organism feed on organic material obtained from the body of another organism is;
5. Holozoic nutrition C. Saprophytic nutrition
6. Parasitic nutrition D. Phagocytosis
7. The following are dental formulae of different animals. Which belongs to a cow?
8. I $\frac{2}{2}$ , C $\frac{1}{1}$ , P, $\frac{2}{2}$ M $\frac{2}{2}$ C. I $\frac{3}{3}$ , C $\frac{1}{1}$ , P $\frac{4}{4}$ , M $\frac{2}{3}$
9. I $\frac{2}{1}$ , C $\frac{0}{0}$ , P, $\frac{3}{2}$ M $\frac{3}{3}$ D. I $\frac{0}{3}$ , C $\frac{0}{1}$ , P, $\frac{3}{3}$ M $\frac{3}{3}$
10. The summary of the equation for the process of photosynthesis is as follows below. Which set represents raw materials for the process?

 6CO2(g) + 6H2O(l) C6H12O6(aq) + 6O2(s)

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48. Dilute hydrochloric acid
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4. To which one of the following groups of plants do ferns belong?
5. Conifers C. Pteridophytes
6. Bryophytes D. Angiosperms.
7. The movement of reducing sugar molecules across the visking tube to distilled water in a beaker is,
8. Osmosis C. Active transport
9. Diffusion D. Pinocytosis

 **SECTION B**

***Attempt all numbers in this section.***

 **Answers to this section must be written in the spaces provided.**

1. An experiment was carried out to investigate the effect of temperature on the activity of enzyme catalase. The results are shown in the table below

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Temp (0C) | 0 | 15 | 25 | 35 | 45 | 50 | 65 | 75 |
| Time taken to evolve 10cm3 of oxygen (second) | 0 | 40 | 20 | 05 | 20 | 40 | 80 | 0 |
| Rate of oxygen release (cm2s–1) | 0 |  |  |  |  |  |  |  |

1. (i) Complete the table by calculating the rate of oxygen release. (3 ½ mks)

 (ii) Using the information in the table. Plot a graph to show the relationship between temperature and the rate of reaction of catalase enzyme. (08 mks)

1. (i) Describe the shape of the graph (03 ½ mks)

…………………………………………………………………………………………..

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(ii) Explain the shape of the graph (03 mks)

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…………………………………………………………………………………………..

…………………………………………………………………………………………..

(iii) State 3 other factors that may affect the activity of catalase apart from that under investigation (03 mks)

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1. An experiment was carried out to investigate whether light is a factor necessary for photosynthesis. The following steps were carried out. Explain the importance of the following procedures.
2. (i) A potted plant is placed in darkness for 48 hours (01 mk)

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…………………………………………………………………………………………..

(ii) After 48 hours, one leaf from the plant is removed and an iodine test carried out on it. (01 mk)

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…………………………………………………………………………………………..

(iii) One leaf from this plant has its lower and upper surfaces covered with an

 aluminium foil. (01 mk)

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…………………………………………………………………………………………..

(iv) One leaf from this plant has its lower and upper surface covered with a transparent sheet. (01 mk)

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…………………………………………………………………………………………..

1. The plant set up is exposed to sunlight for 3 hours (02 mks)

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…………………………………………………………………………………………..

1. Briefly describe how a leaf from (a) above is tested for the presence of starch.

 (08 mks)

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1. (a) Define the following terms
2. Ingestion (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Assimilation (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Dental formula (01 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

 (b) In the space below, write the dental formula of man starting with Incisors (I),

 Canines(C), Premolars (P) and Molars (M). (04 mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

(ii) State two function of incisors in the mammals jaw bone. (02 mks)

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…………………………………………………………………………………………..

 **SECTION C (30 MARKS)**

 ***Attempt only 2 questions from this section.***

 **Answers to this section must be written on the answer sheets provided.**

1. (a) State and describe the role played by enzymes in the following parts of the alimentary canal.
2. Duodenum (05 mks)
3. Ileum (06 mks)

(b) How is the ileum adapted for absorption of food in the alimentary canal? (04 mks)

1. (a) What is dispersal? (01 mk)

(b) Describe how the different dry fruits are dispersed. (14 mks)

1. (a) S.2 South student was given a colourless soft drink rich in non-reducing sugar and vitamin C. Describe the test carried out by the student and observations made to confirm for the presence of these nutrients. (10 mks)

(b) State the functions of the following nutrients in the diet.

 (i) Water (03 mks)

 (ii) Proteins (02 mks)

1. (a) Define the following terms
2. Metamorphosis (01 mk)
3. Parasitic nutrition (01 mk)

 (b) (i) Without diagrams, describe the life cycle of a housefly (11 mks)

 (ii) State two economic importance of a housefly to man (02 mks)

 **END.**

**S.2 CHEMISTRY**

**Duration: 1 Hour 30 Minutes**

1. The results of a paper chromatography experiment are shown in the figure below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| A | B | P | Q | S | R | T |

A and B are different mixtures of some of the pure substances P, Q, R, S, and T

1. Identify the substances in the:
2. Mixture A

...............................................................................................................................................

1. Mixture B

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1. Which substances are present in both mixture S

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 ...............................................................................................................................................

1. Which substances are present in mixture A only?

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1. a) Explain what is meant by the terms:
2. Mass number

...............................................................................................................................................

 ...............................................................................................................................................

1. Atomic number

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 ...............................................................................................................................................

 b) An atom of an element is represented by the symbol

 i) State the mass number of the atom

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 ...............................................................................................................................................

 ii) What is the atomic number of the atom?

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 ...............................................................................................................................................

 iii) How many neutrons are present in the atom?

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1. Oxygen can be prepared from hydrogen peroxide in the presence of a catalyst only
2. i) Name the catalyst used

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1. Write the equation for the formation of oxygen.

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 ...............................................................................................................................................

1. i) Name the class of the oxide to which the following belong

|  |  |
| --- | --- |
| **Oxide** | **Class of oxide** |
| CuO |  |
| PbO |  |
| CO |  |
| CO2 |  |
| Al2O3 |  |
| NO2 |  |
| SO2 |  |

1. a) Complete and balance the following equations ( 1 mk each)
2. Mg(s) + O2(g)
3. H2O2(aq) MnO4
4. CaCO3(s)
5. Zn(s) + HCl(aq)
6. H2SO4(aq) + Pb(NO3)2(aq)

b) Balance the following equations.

1. Al(s) + H2O(l) Al2O3(s) + H2(g)
2. Na(s) + Cl2(g) NaCl(s)
3. Fe(s) + O2(g) Fe3O4(s)
4. Ag2O(s) Ag(s) + O2(g)
5. Ca(HCO3)2(aq) + NaCO3(aq) CaCO3(s) + NaHCO3(aq)

1. Write the chemical formula of the following compounds.
2. Sodium hydrogen carbonate

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1. Zinc Chloride

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1. Aluminium Oxide

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1. Ammonium Sulphate

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1. Potassium nitrate

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 ...............................................................................................................................................

1. Manganese IV oxide

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 ...............................................................................................................................................

1. Magnesium nitride

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**SECTION B**

1. a) i) Draw a well labelled diagram for the preparation of dry hydrogen gas in the

 laboratory (5 mks)

 ii) Write the equation for the reaction ( 1 ½ mks)

 iii) Name the catalyst used in preparation of hydrogen in (i) above ( 1 mk)

 b) Hydrogen was reacted with Copper (II) oxide in a combustion tube.

 i) State the conditions for the reaction. ( 1 mk)

 ii) State what was observed ( 1 mk)

 iii) Write the equation for the reaction ( 1 ½ mks)

1. Describe how you can test for hydrogen in the laboratory ( 1½ mks)
2. State any two uses of hydrogen. ( 2 mks)

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ST. JOSEPH’S SENIOR SECONDARY SCHOOL NAGGALAMA

 **S.2 CHEMISTRY 545/2**

 **TIME: 2 HOURS**

NAME ……………………………………………………………….. STREAM ……………

INDEX NUMBER: ………………………………………………………..

**INSTRUCTIONS:**

* Attempt all questions in section A
* Attempt any two questions from section B.

**SECTION A: (50 MARKS)**

1. Part of the periodic table showing positions of elements Z,Y,X,W,U and V is shown below.

The letters used are not the usual symbols of elements,

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  I |  II  |  |  III |  IV |  V |  VI |  VII |  VIII |
|  |  |
|  Z |  | X |  W |  |  U |  Y |  |
|  |  |  |  |  |   |  |  |
|  |  |  |  |  |  |  |  |  T |
|  |  |  |  |  |  |  |  V |  |

1. (i) Write the formula of the compound formed when Z reacts with Y ( ½ mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

 (ii) State whether the compound formed in (a) (i) dissolves in water or not ( ½ mk)

…………………………………………………………………………………………..

 (iii) Give a reason for your answer in (a) (ii) ( 1 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. (i) Which one of the elements is least reactive? ( ½ mk)

…………………………………………………………………………………………..

ii) State two properties of the compound formed when W reacts with U (1 mk)

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…………………………………………………………………………………………..

1. Give a reason why element X conducts electricity ( 1 mk)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. Copper (II) carbonate was strongly heated:
2. Write the chemical formula of copper (II) carbonate ( ½ mk)

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…………………………………………………………………………………………..

1. State what was observed ( 1 mk)

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1. Write the equation for the decomposition reaction that took place ( 1 ½ mks)

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b) To the residue from (a) was added warm dilute nitric acid,

 i) State what was observed (1 mk)

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 ii) Write the equation for the reaction that took place (1 ½ mks)

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1. A white powder X was heated strongly until no further change. A colourless gas that forms a white precipitate with lime water / calcium hydroxide solution was given off. The residue left was yellow when cold and brown when hot.
2. Name the;
3. White powder ( ½ mk)

…………………………………………………………………………………………..

1. Residue ( ½ mk)

…………………………………………………………………………………………..

1. Colourless gas given off ( ½ mk)

…………………………………………………………………………………………..

1. Write the equation of reaction in (3) above ( 1 ½ mks)

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1. Dilute nitric acid was added to X, and to the resultant solution was added potassium iodide solution.
2. State what was observed when potassium iodide was added ( ½ mk)

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1. Write the equation for the reaction in (c) above ( 1 ½ mks)

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1. Write the equation to show how each of the following salts can be prepared in the laboratory.

(i) Copper (II) sulphate from a suitable carbonate and acid (1 ½ mks)

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………………………………………………………………………………………………

(ii) Lead (II) sulphate from a suitable acid and a nitrate (1 ½ mks)

………………………………………………………………………………………………

………………………………………………………………………………………………

(b) State what would be observed if sodium carbonate solution was added to

 (i) Copper (II) sulphate solution. (1 mk)

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………………………………………………………………………………………………

 (ii) Dilute sulphuric acid (1 mk)

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1. (a) Sulphuric acid is a strong dibasic acid. Explain the terms below.
2. Strong acid ( 1 mk)

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………………………………………………………………………………………………

………………………………………………………………………………………………

1. Basicity ( 1 mk)

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………………………………………………………………………………………………

………………………………………………………………………………………………

(b) Write an equation to show how sulphuric acid ionises in water (1 mk)

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(c) Sulphuric acid reacts with potassium carbonate solution,

(i) Write an equation for the reaction (1 ½ mks)

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1. (a) Calcium, Lead, Potassium and Zinc form part of the metal activity series.
2. Arrange the metals in order of reactivity starting with the least reactive ( 1 mk)

………………………………………………………………………………………….

1. Describe how each of the following metals react with the cold water:
* Potassium (2 mks)

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

* Zinc (½ mk)

………………………………………………………………………………………………

1. Write an equation for the reaction that occurs when potassium reacts with cold water

 (1 ½ mk)

………………………………………………………………………………………………

………………………………………………………………………………………………

c) Iron reacts with steam. Write an equation for the reaction that took place. (1 ½ mks)

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…………………………………………………………………………………………..

1. (a) When water was added to a yellow solid T, oxygen gas was formed
2. Name T ( ½ mk)

………………………………………………………………………………………..

1. Write an equation for the reaction in (a) above ( 1 ½ mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

 (b) Dry oxygen gas was passed over heated zinc powder,

 i) State what was observed ( 1 ½ mks)

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…………………………………………………………………………………………..

 ii) Write the equation of reaction in (b) above ( 1 ½ mks)

…………………………………………………………………………………………..

…………………………………………………………………………………………..

1. (a) (i) Name the compound formed when a mixture of iron and sulphur is heated (½ mk)

 ………………………………………………………………………………………………

 (ii) Write the equation of reaction in (a) above. (1 ½ mks)

………………………………………………………………………………………………

………………………………………………………………………………………………

 (b) State what is observed when a piece of magnet is passed over:

 i) a mixture of iron and sulphur ( ½ mk)

………………………………………………………………………………………………

………………………………………………………………………………………………

ii) compound formed ( ½ mk)

………………………………………………………………………………………………

………………………………………………………………………………………………

 (e) (i) State a suitable method that can be used to separate components of methyl orange

 indicator. ( ½ mk)

 ……………………………………………………………………………………….

 (ii) Why is the method in (c) (i) above used to separate the indicator above. ( 1 mk)

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1. The electronic configuration of atoms W, X, Y and Z are 2:4, 2:7, 2:8:3 and 2:8:7 respectively.
2. Identify the atoms of the elements which are in the same group in the periodic table

(1 mk)

 ………………………………………………………………………………………….

1. State the period to which the element with atom W belongs in the periodic table ( ½ mk)

…………………………………………………………………………………………….

1. Write the formula of the:
2. Ion of atom X ( ½ mk)

………………………………………………………………………………………………

………………………………………………………………………………………………

1. Compound formed when atom Y reacts with atom Z ( ½ mk)

………………………………………………………………………………………………

………………………………………………………………………………………………

1. Atom Z can react with atoms W and Y to form compounds Q and R respectively. Giving a reason, state which one of the compounds
2. Can conduct electricity ( 1 mk)

Compound: ……………………………………………………………………………….

Reason: …………………………………………………………………………………….

………………………………………………………………………………………………

1. Would have a lower solubility in water ( 1 mk)

Compound: …………………………………………………………………………………

Reason: …………………………………………………………………………………….

………………………………………………………………………………………………

1. (a) Define the following terms:
2. Ionic bond ( 1 mk)

………………………………………………………………………………………………

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………………………………………………………………………………………………

1. Covalent bond ( 1 mk)

………………………………………………………………………………………………

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 (b) Using outer most electrons **only**, use electronic structures to show how the following

 compounds are formed

1. Sodium chloride ( 1 mk)
2. Hydrogen chloride ( 1 mk)

(c) Explain why ionic compounds are known to conduct electricity in aqueous or molten

 State.

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………………………………………………………………………………………………

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**SECTION B: (30 MARKS)**

*Attempt* ***any two*** *questions from this section.*

1. (a) What is a salt? ( 1 mk)

(b) (i) Name any two methods of salt preparation ( 1 mk)

 (ii) Describe how Copper (II) sulphate crystals can be prepared in the laboratory using

 Copper (II) oxide. (6 mks)

1. Write the equation for the reaction in the preparation of the above salt

 (c) Dilute sulphuric acid was added to Lead (II) nitrate solution;

 i) State what was observed (1 mk)

 ii) Write an equation for the above reaction (1 ½ mks)

1. Write equations to show the effect of heat on the following salts
2. Lead (II) nitrate ( 1 mk)
3. Silver nitrate ( 1 mk)
4. Sodium carbonate ( ½ mk)
5. Ammonium nitrate ( 1 mk)
6. Calcium carbonate ( 1 mk)
7. Oxygen gas can be prepared in the laboratory using hydrogen peroxide and substance T.
8. (i) Name the substance T. ( 1 mk)

(ii) State the role of substance T (1 mk)

(iii) Write the equation for the reaction above. (1 ½ mks)

1. (i) State the drying agent used in the preparation of oxygen gas. (1 mk)

(ii) Give reasons for using the above drying agent (2 mks)

1. Using equations, describe the reaction of excess oxygen when burnt with the following metals.
2. Magnesium (2 ½ mks)
3. Sodium (2 ½ mks)
4. Elements react with oxygen forming **oxides.** Explain the meaning of the following
5. Amphoteric oxide ( 1 mk)
6. Acidic oxides ( 1 mk)
7. Basic oxide ( 1 mk)
8. Name **one** example of an Amphoteric oxide ( ½ mk)

  **END**

ST. JOSEPH’S SENIOR SECONDARY SCHOOL NAGGALAMA

 **S.2 PHYSICS PAPER 2**

 **TIME: 1 HOUR 30 MINUTES.**

NAME ……………………………………………………………….. STREAM ……………

INDEX NUMBER: ………………………………………………………..

**INSTRUCTIONS:**

* Attempt all questions
* Where necessary use acceleration due to gravity g = 10ms–2
1. (a) Define **density** and state its S.I unit (02 mks)

(b) Describe an experiment to determine the density of an irregular object. (04 mks)

(c) (i) What is meant by surface tension? (01 mk)

 (ii) State two ways of reducing surface tension of a liquid (02 mks)

(d) (i) Explain what is observed when smoke is enclosed in an illuminated transparent

 cell and viewed through a microscope. (02 mks)

 (ii) State what is observed in (d) (i) when the cell is placed on ice blocks.

 Give a reason for your answer. (02 mks)

 (e) An irregular object was gently lowered in a measuring cylinder containing

 150cm3 of water. Water rose to a level of 175cm3. If the mass of the object is 50g,

 calculate the density of the object in g cm–3

1. (a) State the laws of reflection of light. (02 mks)

(b) With the aid of a diagram describe how a pin – hole camera works (03 mks)

(c) (i) With the aid of ray diagrams, distinguish between the two types of reflection of

 light (03 mks)

 (ii) A person stands 5m away from a plane mirror. Find the distance that the person

 must move in order to be 2m away from the image in the mirror. (02 mks)

(d) (i) What is meant by thermal radiation? (01 mk)

 (ii) Give one example of a liquid that is a good conductor of heat. (01 mk)

 (iii) Explain why metals are better conductors of heat than non – metals. (02 mks)

1. (a) Define the following terms:
2. Velocity (01 mk)
3. Acceleration (01 mk)

 (b) Describe how you would determine the acceleration of the body using a ticker timer

 of frequency 50HZ. (03 mks)

 (c) The figure below shows a velocity – time graph for a vehicle in motion.

 60

 40

 20

 0

 0 20 40 60

1. Find the total distance the vehicle moved (04 mks)
2. Calculate the retardation of the vehicle (03 mks)

(d) (i) State Pascal’s principle (01 mk)

 (ii) The figure below shows a hydraulic pressure. A and B are cylindrical pistons of

 radii 2cm and 4cm respectively.

 A B

 - - - - -

 - - - -

 - - -\_-

 -\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ - - -

 - - -- - - - - - - - - - - - - - - -

Calculate the maximum force at B that can be overcome by a force of 78N applied at A

 (03 mks)

**ST. JOSEPH’S SENIOR SECONDARY SCHOOL NAGGALAMA**

**S.2 – PHYSICS PAPER 1**

**TIME: 1 ½ HOURS**

**RANDOM NUMBER .................................................................................................**

**INSTRUCTIONS:**

* *Answer* ***all*** *questions in section* ***A*** *and* ***B*** *and any* ***two*** *questions from section C.*
* *In Section A, write the letter which corresponds to the correct answer in the answer grid provided.*
* *For Section B, write the answers in the spaces provided.*
* *In Section C, use the answer sheets provided.*
* *The following values of physical quantities may be useful to you.*
* Acceleration due to gravity, g, = 10ms – 2
* Density of water = 1000kgm – 3
* Density of mercy = 13600kgm – 3
* Atmospheric pressure = 76cmHg

**SECTION A:**

**Answer Grid for Section A**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | 11. | 21. | 31. |
| 2. | 12. | 22. | 32. |
| 3. | 13. | 23. | 33. |
| 4. | 14. | 24. | 34. |
| 5. | 15. | 25. | 35. |
| 6. | 16. | 26. | 36. |
| 7. | 17. | 27. | 37. |
| 8. | 18. | 28. | 38. |
| 9. | 19. | 29. | 39. |
| 10. | 20. | 30. | 40. |

1. When the size of a pinhole camera is enlarged, the resulting image is

 (A) bright (B) blurred (C) magnified (D) unright

2. What is the angle of inclination between two plane mirrors if the number of images is 7 ?

 (A) 150o (B) 30o  (C) 45o (D) 60o

3. Pilots operating at great heights must have head gears to prevent nose bleeding because at great heights atmospheric pressure is

1. equal to blood pressure. (C) greater than blood pressure
2. smaller than blood pressure. (D) independent of density of air

4. Becky shouted complaining of too much pain when she was stepped on by her sister putting on high heeled shoes than when stepped on by her brother putting on a flat shoe. Both the sister and brother have the same weight.

 The major explanation for her behaviour is that

1. A high heeled shoe exerts less pressure than a flat shoe.
2. A high heeled shoe exerts pressure equal to that of a flat shoe.
3. A high heeled shoe exerts greater pressure than a flat shoe.
4. A high heeled shoe has a smaller weight than a flat shoe.

5. Due to anomalous expansion of water at 4oC , water has a maximum of

 (A) density (B) volume (C) mass (D) weight

6. Alcohol is used when measuring low temperatures because

 (A) alcohol has a high expansion rate

 (B) alcohol has a high boiling point

 (C) alcohol has a low freezing point

 (D) alcohol has a high conduction rate

7. The following are vector quantities except

 (A) Mass (B) Acceleration (C) Velocity (D) Force

8. Which one of the following is the S.1 unit of length ?

 (A) cm (B) mm (C) km (D) m

9. The major reason of putting the damp proof course between the foundation and main building is to prevent

1. capillarity (B) cohesion (C) diffusion (D) adhesion

10. The formular for finding the velocity of a hydraulic press machine with a big piston of radius **R** and small piston of radius **r** is

1. $\frac{R}{r}$ (B) $\frac{r}{R}$ (C) R2 (D) r2

 r2 R2

11. What does beam balance measure ?

 (A) mass (B) density (C) volume (D) pressure

12. A piece of wood has mass 250g and volume of 400cm3. What is its density ?

 (A) 0.625gcm-3 (B) 1.60gcm-3 (C) 100000gcm-3 (D) 0.250gcm-3

13. Which of the following physical properties change when a body is moved from the earth to the moon?

 (A) Moon (B) Volume (C) Weight (D) Density

14. A force of 1N acts on a mass of 0.05kg initially at rest. Its acceleration is

 (A) 0.05ms-2 (B) 1ms-2 (C) 2ms-2 (D) 20ms-2

15. **Two forces act on the body as shown below**

 3N

 4N

 The resultant force on the body is

1. 7N (B) 1N (C) 12N (D) 5N

16. A hippopotamus can easily walk on mud without sinking while a goat will sink because

 (A) A hippopotamus has more weight than a goat.

 (B) The centre of gravity of a hippopotamus is lower than that of a goat.

 (C) A hippopotamus exerts more pressure on the ground than the goat.

 (D) A hippopotamus exerts less pressure on the ground than the goat.

17. The diagram below shows a uniform metre rule balanced horizontally on a knife edge at the 30cm mark when a weight of 60N is suspended from 0cm mark as shown below.

 0cm 30cm 50cm 100cm

 60N ***W***

 Find the weight ***W*** of the metre rule.

1. 90N (B) 1800N (C) 100N (D) 24N

18. Velocity ratio is

 (A) Efficiency x mechanical advantage (C) Load distance

 Effort distance

 (B) Effort distance (D) Load

 Load distance Effort

19. Radiation in a thermos flask is minimized by

 (A) Cork (B) vacuum (C) silvered glass walls (D) felt pad

20. The density of a substance is

 (A) volume of a given unit of matter (C) space occupied by a substance

 (B) pull of a gravity on a substance (D) quantity of matter in a unit volume

21. Force is given by product of

 (A) mass and density (C) volume and density

 (B) mass and volume (D) mass and acceleration

22. Which of the following sets contain units of basic quantities ?

 (A) kilogram, metre, second (C) mass, length, time

 (B) metre, kilogram, newton (D) velocity, weight, temperature

23. The transfer of heat by actual movement of molecules of matter takes place

 (A) only in liquids (C) Both in liquids and gasses

 (B) Only in gases (D) Both in solids and liquids.

24. A crystal of potassium dichromate is placed at the bottom of the beaker full of water and is found to spread due to

1. Surface tension (B) Capillarity (C) Diffusion (D) Osmosis

25. In a hydraulic press a force of 200N is applied to a piston of area 0.2m2. Find the force applied on the other piston of area 1.5m2

1. 250N (B) 1500N (C) 150N (D) 3000N

26. A piece of rock weighs 360N on the moon where the acceleration due to gravity is one-sixth of that on earth. What is the weight of the rock on the earth ?

1. 1.667N (B) 2160N (C) 600N (D) 3600N

27. A bus carrying a heavy load on its rack is more unstable because

 (A) its centre of gravity is raised. (C) the friction on the ground increases

 (B) its total weight is increased (D) the pressure on the tyre is increased

28. The purpose of treads on car tyres is to make them

 (A) attractive (C) grip the road surface

 (B) reduce friction (D) stronger

29. The force that gives a body of mass 1kg an acceleration of 1ms2 is

 (A) Weight (B) Newton (C) Friction (D) Gravity

30. The fins of car radiators are painted black because black bodies are poor

 (A) transmitters of heat (C) absorbers of heat

 (B) reflectors of heat (D) radiators of heat

31. A load of 1000N is raised up the building by an effort of 500N using a pulley system, what is its mechanical advantage ?

1. 500 (B) 0.5 (C) 2 (D) 25

32. A sea breeze occurs

 (A) when cool air blows towards land. (C) during the night

 (B) when warm air blows towards land (D) during the day

33. The S.1 unit of pressure is

 (A) Metre (B) Newton per meter (C) Kilogram (D) Pascals

34. Surface tension in a liquid may be weakened by

 (A) lowering the temperature (C) increasing the amount of liquids.

 (B) adding soap solutions (D) increasing the density of the liquid.

35. Which one of the following fluids is a better conductor of heat ?

 (A) Alcohol (B) Mercury (C) Water (D) Air

36. A car starts from rest and accelerates uniformly at 2ms – 2. Find the distance it covers in

6 seconds

 (A) 12m (B) 36m (C) 72m (D) 108m

37. In a hydraulic press, the area of the piston on which the effort is applied is made smaller in order to

1. Facilitate the movement of the piston downwards.
2. Transmit a force as large as possible to the load.
3. Transmit pressure equally throughout the liquid.
4. Obtain a pressure as large as possible.

38. A uniform metre rule is suspended with a string at the 20cm mark and is kept horizontal by a mass of 120g from one end as shown below.

 0cm 100cm

 120g

 Find the mass of the metre rule

1. 80g (B) 30g (C) 24g (D) 120g

39. Calculate the pressure exerted on the road by a car of mass 740kg if the area of contact between the road and each of the four tyres is 50cm3

1. 37Nm-2 (B) 37 x 104 Nm-2 (C) 3.7 x 105Nm-2 (D) 1.48 x 106Nm-2

40.

 **F**  4 kg 10N

The diagram above shows a block of wood of mass 4kg placed on a smooth table and two forces applied on it. If the acceleration of the body is 2ms-2 in the direction of 10N force,

find F

1. 2N (B) 2.5N (C) 6N (D) 30N

**SECTION B: (40 Marks)**

**Write the answers in the spaces provided.**

41. (a) State **two** properties of images formed by a plane mirror. (2mks)

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2. ................................................................................................................................

42. (a) (i) State **Pascal’s principle** of transmission of pressure in fluids. (1mk)

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 (ii) State at least one assumption of the principle above. (1mk)

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(b) In a hydraulic machine, a force of 20N is exerted on a small piston of area 2m2.

 If the large piston has an area of 100m2, calculate the force exerted on the large

piston. (2mks)

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43. (a) Define the following as used in curved mirrors.

1. **Focal length**

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1. **Radius of curvature**

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44. (a) Define the following terms used in thermometry.

 (i) **lower fixed point**

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 (ii) **fundamental interval**

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(b) Convert a temperature of –34oC to Kelvin (2mks)

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 45. (a) State the **laws** of **reflection of light** (2mks)

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(b) **The figure below shows a ray of light striking a plane mirror.**

 30o

 Calculate the angle of:

1. Incidence (2mks)

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1. Reflection (2mks)

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46. (a) Define the following terms as used in machines:

 (i) **velocity ratio** (1mk)

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 (ii) **efficiency** (1mk)

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(b) A machine lifts a load of 200N through 1m when an effort of 5N is exerted on it. If the effort moves through a distance of 6m, find the;

1. Mechanical advantage (1mk)

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1. Velocity ratio (1mk)

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1. Efficiency (1mk)

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47. (a) Define **pressure** and state its **S.1** units. (2mks)

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 S.1 units: .....................................................................................................................

(b) A box of dimensions 5cm by 4cm by 3cm has a mass of 500g. Calculate the maximum pressure it can exert on a flat surface. (3mks)

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48. (a) Differentiate between **scalar** and **vector** quantities (1mk)

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(b) **The diagram below shows forces of 3N, 6N and 10N acting on a particle of mass 2kg.**

 **3N**

 6N 10N

 Find the acceleration of the particle. (3mks)

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49. (a) State the principle of moments. (1mk)

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(b) A uniform metre rule balances horizontally on a knife edge at 40cm when a mass of 100g hangs at the 0cm mark as shown below.

 0cm 40cm 100cm

 100g

 Find the mass of the metre rule (3mks)

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50. (a) Define:

 (i) **uniform velocity** (1mk)

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 (ii) **uniform acceleration** (1mk)

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(b) The ticker tape shown in the figure below was pulled through a ticker-timer which makes 50 dots per second.

 20cm

 **E** **F**

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(a) Find the speed at which the tape was pulled.

\*\*\*\* END \*\*\*\*