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கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2020
General Certificate of Education (Ord. Level) Examination, 2020

විද්‍යාව I
விஞ்ஞானம் I
Science I

පැය එකයි
ஒரு மணித்தியாலம்
One hour

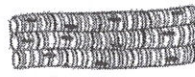
Note :

- * Answer all questions.
- * In each of the questions 1 to 40, pick one of the alternatives (1), (2), (3), (4) which you consider is correct or most appropriate.
- * Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- * Further instructions are given on the back of the answer sheet. Follow them carefully.

- The fundamental structural and functional unit of life is the
(1) cell. (2) tissue. (3) organ. (4) system.
- What is the pair of subatomic particles which attract each other?
(1) electrons and neutrons (2) electrons and protons
(3) protons and neutrons (4) electrons and electrons
- The unit of momentum is
(1) kg m s^{-1} . (2) kg m s^{-2} . (3) $\text{kg m}^{-1} \text{s}^{-1}$. (4) $\text{kg m}^2 \text{s}^{-2}$.
- The figures A, B and C below indicate three types of muscle tissues.



A



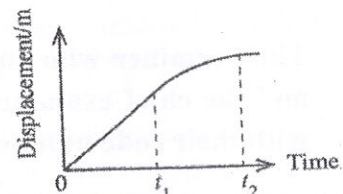
B



C

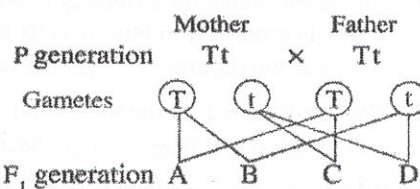
A, B and C above respectively are

- smooth muscle, cardiac muscle and skeletal muscle tissues.
 - skeletal muscle, smooth muscle and cardiac muscle tissues.
 - smooth muscle, skeletal muscle and cardiac muscle tissues.
 - cardiac muscle, skeletal muscle and smooth muscle tissues.
- Which of the following is the molecule with highest number of covalent bonds?
(1) O_2 (2) N_2 (3) NH_3 (4) CO_2
 - Heat is transmitted from the Sun to the Earth by
(1) radiation. (2) conduction.
(3) convection. (4) radiation and convection.
 - As was extracted by a student from an environmental pyramid, that ecosystem has one producer, eight primary consumers and twenty three secondary consumers. The student has extracted this information from a
(1) upright number pyramid. (2) inverted number pyramid.
(3) upright biomass pyramid. (4) inverted biomass pyramid.
 - Here is shown the displacement-time graph of the motion of an object. During the time intervals from 0 to t_1 and t_1 to t_2 , the nature of the motion of the object respectively is,
(1) a uniform velocity and an acceleration.
(2) a uniform velocity and a retardation.
(3) a uniform acceleration and a retardation.
(4) a uniform retardation and an acceleration.

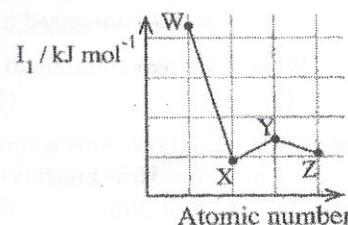


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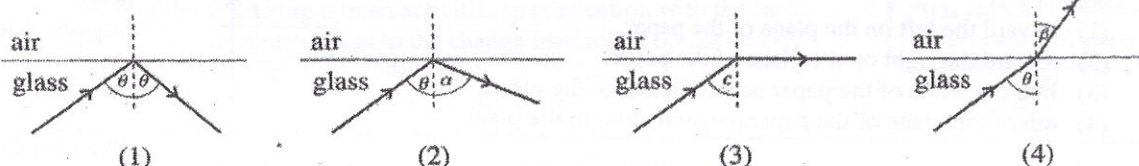
- Questions 9 and 10 are based on the following information and the illustration. Production of haemoglobin is disturbed by thalassemia, an inherited disease caused by the gene mutation in a somatic chromosome. With regard to the production of haemoglobin naturally, the dominant gene is T while the mutant recessive gene is t. A, B, C, and D indicate the F_1 generation.



9. A thalassemia patient belonging to the F_1 generation is
(1) A. (2) B. (3) C. (4) D.
10. The ratio among the thalassemia patients, healthy disease carriers and healthy individuals belonging to the F_1 generation is
(1) 1:1:1. (2) 1:1:2. (3) 1:2:1. (4) 2:1:1.
11. Which statement is always true about the magnitude of displacement of a certain object?
(1) greater than the distance moved (2) equal to the distance moved
(3) lesser than the distance moved (4) either equal to or less than the distance moved
12. The electronic configurations of the atoms of two elements X and Y are 2, 8, 1 and 2, 8, 7 respectively. Of the following statements about the pair of those elements, which statement is false?
(1) located in the same period in the Periodic Table
(2) located in the same group in the Periodic Table
(3) chemically combine forming ionic bonds
(4) combine and form the compound with the chemical formula XY
13. What is the number of O_2 molecules contained in 64 g of oxygen gas? (O = 16)
(1) 6.022×10^{23} (2) $2 \times 6.022 \times 10^{23}$ (3) $4 \times 6.022 \times 10^{23}$ (4) $64 \times 6.022 \times 10^{23}$
14. W, X, Y and Z are four elements consecutively placed in the Periodic Table with atomic numbers below 20. The graph indicates how their first ionisation energy (I_1) varies against the atomic number. In which group of the Periodic Table is Y placed?
(1) I (2) II
(3) III (4) IV



15. The substances acting as the main components providing energy for the functioning of the human body are
(1) proteins and lipids. (2) proteins and vitamins.
(3) carbohydrates and lipids. (4) carbohydrates and proteins.
16. A person's glucose level in the blood has increased above the optimum level. Which of the following food items should he consume minimally?
(1) meat (2) milk (3) green gram (mung/payau) (4) bread
17. Select the false statement about nucleic acids.
(1) building unit is called nucleotide (2) a natural polymer
(3) store hereditary information (4) contain the elements C, H, O and N only
18. Examples for the seeds/fruits dispersed by water, wind and explosive mechanism respectively are
(1) Ceylon almond(kottamba/kaththappu), hora and mango. (2) lotus, castor (endaru/amanakku) and rubber.
(3) coconut, milkweed (vara/erukkalai) and rubber. (4) jack, cotton and okra (bandakka/vendi).
19. Which of the following does not pass into the foetus from the mother through the umbilical cord?
(1) blood (2) nutrients (3) oxygen (4) pathogens
20. What is the ray diagram which illustrates the phenomenon of total internal reflection?

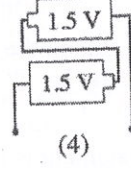
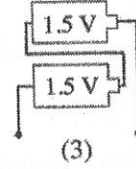
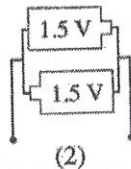
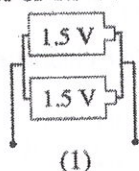


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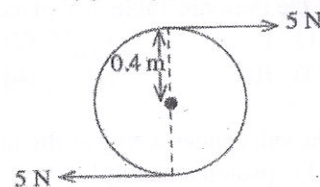
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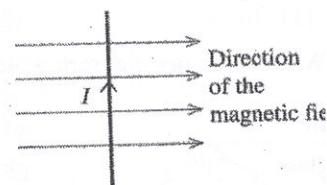
21. An athlete finishing a running event suffered from a cramp in his leg. What is the chemical compound which is produced in muscle cells causing the cramp?
 (1) carbon dioxide (2) ethyl alcohol (3) lactic acid (4) acetic acid
22. A warm-blooded (homoeothermic) animal and a cold-blood (poikilothermic) animal respectively are
 (1) pigeon and frog. (2) bear and rat. (3) rat snake and whale. (4) crocodile and tortoise.
23. Which arrangement can be used to obtain a voltage of 3 V from two dry cells each with an electromotive force of 1.5 V?



24. What is the metal that reacts with hot water but not with cold water?
 (1) sodium (2) magnesium (3) aluminium (4) calcium
25. What is the correct statement about the Covid-19 virus?
 (1) can be observed by the optical microscope (2) carries out metabolic activities
 (3) bears a nucleus with DNA (4) shows living as well as non-living characteristics
26. When salt is extracted from sea water in a saltern, what is the compound that precipitates along with NaCl?
 (1) Na_2SO_4 (2) MgCl_2 (3) CaCO_3 (4) CaSO_4
27. The maximum upthrust exerted by water on a certain object is less than the weight of the object. Then, the object will
 (1) float on the water surface. (2) float partly immersed in water.
 (3) float fully immersed in water. (4) sink fully in water.
28. What is the part common to the human digestive system and the human respiratory system?
 (1) mouth (2) oesophagus (3) pharynx (4) larynx
29. The figure shows how a couple of forces is applied to rotate a wheel of 0.4 m radius. How much is the moment of this couple?
 (1) $5 \times 0.4 \text{ Nm}$ (2) $5 \times 0.8 \text{ Nm}$
 (3) $5 \times 5 \times 0.4 \text{ Nm}$ (4) $5 \times 5 \times 0.8 \text{ Nm}$



30. What is the mole fraction of O_2 in a mixture containing 96 g of oxygen gas (O_2) and 56 g of nitrogen gas (N_2)? ($N = 14, O = 16$)
 (1) $\frac{1}{5}$ (2) $\frac{2}{5}$ (3) $\frac{3}{5}$ (4) $\frac{4}{5}$
31. Given below are four ways by which zinc metal and hydrochloric acid were reacted at room temperature. In which way is hydrogen gas liberated with the highest speed?
 (1) zinc granules + dilute hydrochloric (2) zinc granules + concentrated hydrochloric
 (3) zinc powder + dilute hydrochloric (4) zinc powder + concentrated hydrochloric
32. Between a strong acid and a strong base,
 (1) an exothermic neutralization reaction occurs. (2) an endothermic neutralization reaction occurs.
 (3) an exothermic combination reaction occurs. (4) an endothermic combination reaction occurs.
33. A conductor carrying an electric current I , is kept perpendicular to a magnetic field as shown in the diagram. Horizontal lines indicate the direction of the magnetic field. The direction of the force acting on the conductor is
 (1) toward the left on the plane of the paper.
 (2) toward the right on the plane of the paper.
 (3) into the plane of the paper perpendicular to the plane.
 (4) out of the plane of the paper perpendicular to the plane.

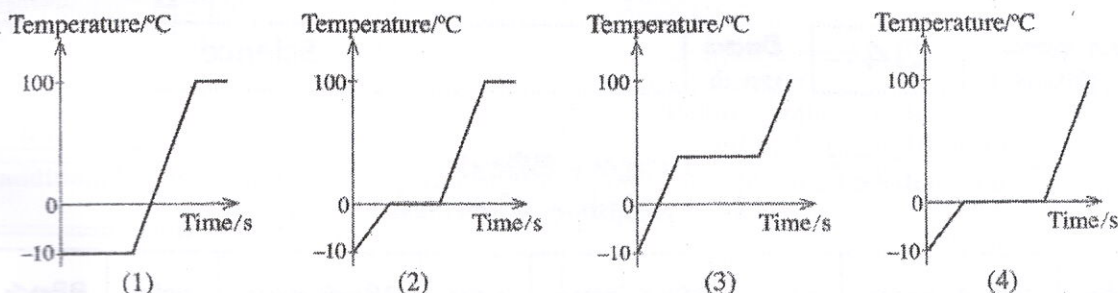


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34. Under normal atmospheric pressure, a pure block of ice at temperature -10°C was heated at a uniform rate until it was turned into liquid water and then for some time after the water started to boil. Which graph correctly indicates the variation of the temperature of the system with time?



35. Consider the following statements presented regarding natural rubber.

A - It is a linear polymer.

B - Isoprene is the monomer.

C - There are cross links among the chains.

Of these statements

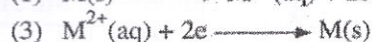
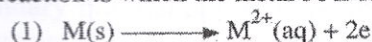
(1) only A is true.

(2) only A and B are true.

(3) only B and C are true.

(4) only A and C are true.

36. Corrosion of iron can be controlled by keeping iron in contact with the bivalent metal M. What is the half reaction to which the metal M is subjected here?



37. A 4 N force and a 3 N force are applied on an object at the same instance. Consider the following statements given about the magnitude of the resultant obtainable at that occasion.

A - The maximum magnitude of the resultant obtainable is 7 N.

B - The minimum magnitude of the resultant obtainable is 1 N.

C - The magnitude of the resultant obtainable is always 5 N.

Of the above, the correct statement(s) is / are

(1) only A.

(2) only B.

(3) only C.

(4) only A and B.

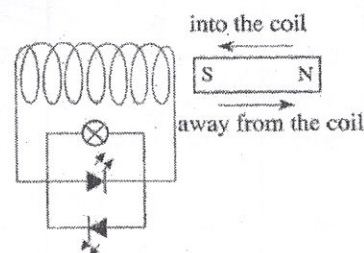
38. A strong bar magnet is moved into and away from an insulated wire coil with a large number of turns as illustrated by the diagram. What is the correct observation about the instances of movement of the magnet?

(1) In both instances, both the bulb and two LEDs light simultaneously.

(2) In both instances, the bulb lights and only one LED lights.

(3) The bulb and one LED light only when moved into the coil.

(4) The bulb and one LED light only when moved away from the coil.



39. Consider the following statements.

A - Biomagnification occurs along a food chain.

B - Toxic chemical pollutants concentrate more in the upper trophic levels of a food chain.

Of the above statements,

(1) both A and B are true.

(2) A is true while B is false.

(3) A is false while B is true.

(4) both A and B are false.

40. A statement displayed on a board near a tank is shown in the figure.

Which of the following human activities in connection with the tank would have contributed most to the change mentioned on the board?

(1) clearing the area above the tank

(2) increase in algae population due to fishing

(3) accumulation of oil and grease due to vehicle wash

(4) addition of faecal and excretory matter to the water

"It is you who turned the water in this tank green"