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Model Question Papers

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Dr. Capt. N. Arumugam,

M.Sc.,M.Phil.,Ph.D.,FZI,FIAES
Gold Medallist, Zoological Society of India,
Fellow, Indian Academy of Environmental Sciences,
Fellow, Zoological Society of India,
Principal and Head(Rtd.), Dept. of Zoology,
Vivekananda College, Agasteeswaram, Kanyakumari
Dist - 629 701.

P. Senthil Kumar,

M.Sc.,M.Phil.,B.Ed.
PG Asst. in Biology,
SMSV Higher Secondary School,
Karaikudi.

SARAS PUBLICATION

114/35G, A.R.P. Camp Road, Periavilai, Kottar P.O.,
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10th Science-Model Question Papers

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Question Papers

R. Amutha Kayathri - 1,2,4,7,10,11,12

M.Sc., B.Ed., PGDCA

K. Kamala Sree - 3,5

M.Sc., M.Phil., B.Ed.

S. Angel Suby M.Sc., PGDCA - 6,8,9

M.V. Deepa M.Sc., PGDIW -2,4

& WWT., PGDCR., DMLT.

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மொத்த வினாக்கள் - 552

கலை

5 Model Solved Question Paper

Class :X

Marks : 75

Part - I

12 x 1 = 12

Choose the Correct Answer

- | | |
|---|---|
| <p>1. Impulse is equal to</p> <p>a) <i>rate of change of momentum</i>
 b) <i>rate of force and time</i>
 c) <i>change of momentum</i>
 d) <i>rate of change of mass</i></p> <hr/> <p>2. In a myopic eye, the image of the object is formed</p> <p>a) <i>behind the retina</i> b) <i>on the retina</i>
 c) <i>in front of the retina</i>
 d) <i>on the blind spot</i></p> <hr/> <p>3. Number of molecules of CO₂ present in 4.4g of CO₂ is</p> <p>a) 6.023×10^{23} b) 3×10^{23}
 c) 12×10^{23} d) 3×10^{10}</p> <hr/> <p>4. The first LED TV screen was developed in the year.</p> <p>a) 1977 b) 1997
 c) 2009 d) 1917</p> <hr/> <p>5. The basis of modern periodic law is _____.</p> <p>a) <i>atomic number</i> b) <i>atomic mass</i>
 c) <i>isotopic mass</i>
 d) <i>number of neutrons</i></p> <hr/> <p>6. Which of the following pairs can be the successive members of a homologous series?</p> | <p>a. C_3H_8 and C_4H_{10}
 b. C_2H_2 and C_2H_4
 c. CH_4 and C_3H_6
 d. C_2H_5OH and C_4H_8OH</p> <hr/> <p>7. The endarch condition is the characteristic feature of</p> <p>a) <i>root</i> b) <i>stem</i>
 c) <i>leaves</i> d) <i>flower</i></p> <hr/> <p>8. The body of leech has</p> <p>a) <i>23 segments</i> b) <i>33 segments</i>
 c) <i>38 segments</i> d) <i>30 segments</i></p> <hr/> <p>9. Gibberellins cause:</p> <p>a) <i>Shortening of genetically tall plants</i>
 b) <i>Elongation of dwarf plants</i>
 c) <i>Promotion of rooting</i>
 d) <i>Yellowing of young leaves</i></p> <hr/> <p>10. There are polar nuclei in the embryo sac.</p> <p>a) 2 b) 3
 c) 4 d) 1</p> <hr/> <p>11. is caused by the mutation of a single gene.</p> <p>a) <i>Sickle cell anaemia</i> b) <i>Fever</i>
 c) <i>Cold</i>
 d) <i>Down's syndrome</i></p> <hr/> <p>12. Biogenesis was speculated by</p> <p>a) <i>Haldane</i> b) <i>Pasteur</i>
 c) <i>Darwin</i> d) <i>Lamarck</i></p> |
|---|---|

Part - II

7 x 2 = 14

Answer any seven questions
(Q.No.22 is compulsory)

13. How does an astronaut float in a space shuttle?

14. Why are traffic signals red in colour?

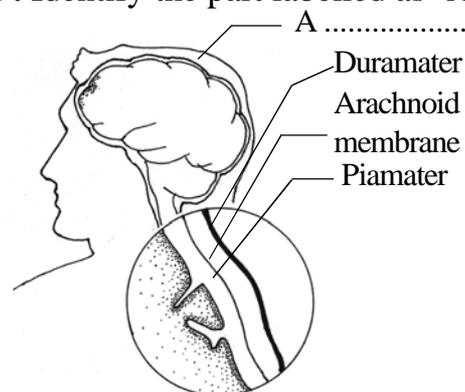
15. What connection is used in domestic appliances and why?

16. Mule is sterile in the reproduction point of view. Why?

17. A hot saturated solution of copper sulphate forms crystals as it cools. Why?

18. Who discovered Rh factor? Why was it named so?

19. Identify the part labelled as 'A'.



20. What is the role of parathormone?

21. How can you determine the age of the fossils?

22. Molecular mass of nitrogen is 28. Its atomic mass is 14. Find the atomicity of nitrogen.

Part - III

7 x 4 = 28

Answer any seven questions
(Q.No.32 is compulsory)

23. Explain the role or importance of ciliary muscle in eye accommodation.

24. Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

25. Mention two cases in which there is no Doppler effect in sound?

26. a) In Japan, some of the new born children are having congenital diseases. Why?

b) What are the different modes used to calculate the number of moles?

27. Explain magnetic separation method for the separation of ore with a neat diagram.

28. How is the circulatory system designed in leech to compensate the heart structure?

29. Enumerate the functions of blood.

30. Explain the role of growth hormone and the disorders caused by it.

31. A pure tall plant (TT) is crossed with pure dwarf plant (tt), what would be the F₁ and F₂ generations? Explain.

32. a) 'A' is a blue coloured crystalline salt. On heating it loses blue colour and to give 'B'. When water is added, 'B' gives back to 'A'. Identify A and B. Write the equation.

b) An aluminium rod is heated from 20°C to 100°C. The initial length of rod is 5 cm. The coefficient of cubical expansion is $24 \times 10^{-6} \text{C}^{-1}$. Its final volume expansion is 125.72 cm^3 . Find the change in volume.

Part - IV

3 x 7 = 21

Note: 1. Answer all questions

2. Each question carries seven marks

3. Draw diagram wherever necessary

33. a) i) Describe Galileo's concepts about force, motion and inertia of bodies.

ii) Define dispersion of light.

iii) State the law of volume.

(OR)

b) i) Distinguish between the resistivity and conductivity of a conductor.

ii) Explain the units of radioactivity.

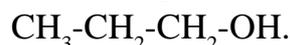
34. a) i) Calculate the number of water molecule present in one drop of water which weighs 0.18 g.

ii) Define Hydrated salt.

(OR)

b) i) Write one equation each for decomposition reactions where energy is supplied in the form of heat, light or electricity.

ii) Arrive at, systematically, the IUPAC name of the compound:



35. a) i) How is the digestive system of rabbit suited for herbivorous mode of feeding?

ii) How does the pulmonary artery and pulmonary vein differ in their function when compared to a normal artery and vein?

iii) What is meant by homeostasis?

(OR)

b) i) Describe an experiment which demonstrates that growth stimulating hormone is produced at the tip of coleoptile.

ii) What is a plasmid?

Answers

Part - I

- | | | | | | | |
|--------|--------|---------|---------|---------|--------|--------|
| 1. (c) | 2. (c) | 3. (a) | 4. (a) | 5. (a) | 6. (a) | 7. (b) |
| 8. (b) | 9. (b) | 10. (a) | 11. (a) | 12. (b) | | |

Part - II

13. 1. Due to their *huge orbital velocity*.

2. Space station and astronauts have *equal acceleration*.

3. They are under *free fall condition*.

14. 1. Red has the *longest wavelength*.

2. Therefore, it is *least scattered* by fog or smoke.

3. Hence, they travel the longest distance.

4. Hence, it can be *seen from long distance*.

15. **Connection**

* Parallel connection.

Reasons

* The appliances can be switched *ON and OFF independently*.

* All the appliances get an *equal voltage*.

16.1. *Dissimilarity of chromosomes* received from the parents.

2. Failure of segregations of chromosomes during gamete formation.

17. 1. As the solution cools, the water molecules *move closer* together again.

2. There is *less room* for the solution to hold onto as much of the dissolved solid.

18. **Discovery**

Landsteiner and *Wiener* in 1940.

Reason

It was first discovered in Rhesus monkey.

19. **A - Meninges**

20. • Regulates *calcium* and *phosphorus metabolism*.

• Acts on *bone, kidney* and *intestine* to maintain blood *calcium* levels.

21. 1. The age of fossils is determined by *radioactive carbon* (C^{14}) *dating* method.

2. It can be calculated by measuring the amount of C^{14} present in the fossils.

22. **Solution:**

Molecular mass of nitrogen = 28

Atomic mass of nitrogen = 14

Atomicity = $\frac{\text{Molecular mass}}{\text{Atomic mass}}$

$= \frac{28}{14}$

$= 2$

Atomicity = 2

Part - III

23. • It *helps to change the focal length* of the eye lens according to the position of the object.

To See Distant Objects

• Ciliary muscles *relax*.

• The *eye lens* becomes thin.

• Focal length increases

To See Nearby Objects

• Ciliary muscles *contract*.

- The lens becomes thick.
- Focal length decreases.

24. 1) The liquid is filled in a *container* up to a level L_1 .

2) **Heat** the container using a **burner**.

3) Container **expands** due to thermal energy.

4) Now **reduction** of **volume** level appears in liquid.

5) Volume level is marked as L_2

6) Liquid will reach the level L_3 on further heating

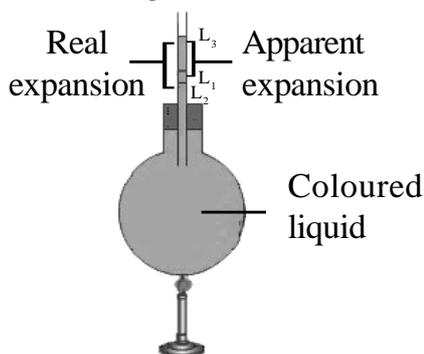


Fig. Real and apparent expansion of liquid.

7) Difference between the levels L_1 and L_3 is called as **apparent expansion**.

$$\text{Apparent expansion} = L_3 - L_1$$

8) Difference between the levels L_2 and L_3 is called as **real expansion**.

$$\text{Real expansion} = L_3 - L_2$$

9) The real expansion is always more than apparent expansion.

25. No Doppler effect in sound means **no change in frequency**.

1. When the **source** of sound and the **listener** move in the **same direction**.

2. When the source and listener move with the **same speed**.

3. When the **source** and **listener** are at **rest**.

4. When **source** and **listener** move **perpendicular** to each other.

5. When the **source** of sound is at the **centre** of the circle and the **listener** is **moving** on the **circle** with **uniform speed**.

26. a) 1. In 1945, two atom bombs were exploded in Japan.

2. The explosion emitted hazardous radiations like gamma rays.

3. These gamma rays (γ) caused **genetic diseases**.

b) 1. Number of = Mass/Atomic mass moles

2. Number of = Mass/molecular mass moles

3. Number of = Number of Atoms/ moles 6.023×10^{23}

4. Number of = Number of molecules / 6.023×10^{23}

27. 1. This method is used to concentrate or separate ore with **magnetic properties**

2. When **either** the ore or the gangue is magnetic, this method is employed.

Principle

♣ The **magnetic properties** of the ore form the basis of separation.

♣ Example:- Tinstone SnO_2 , the ore of tin.

Method

1. The crushed ore is placed over the **conveyor belt**.

2. The conveyer belt rotates around **two metal wheels**.

3. **One** wheel is **magnetic**.

4. Magnetic particles are **attracted** to the magnetic wheel.

5. Magnetic particles fall separately apart from the non-magnetic particles.

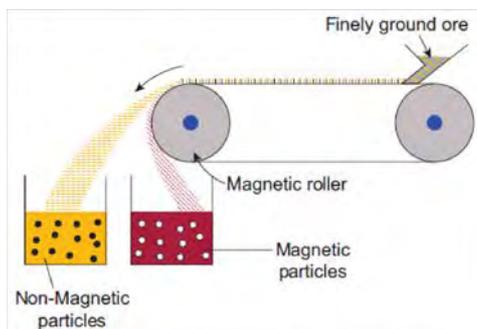


Fig. Magnetic separation

28. Leech has a pair of **lateral haemocoelic channels**. They contain inner **valves**. So, they serve as **heart** in leech.

1. **Haemocoelic circulatory system**.

2. **Open** circulatory system.

3. True blood vessels are absent.

4. The blood vessels are replaced by **haemocoelic channels** or **canals**.

5. There are four longitudinal channels, they are

1. **Dorsal channel** - 1

2. **Ventral channel** - 1

3. **Lateral channels** - 2

6. Dorsal channel lies **above** the alimentary canal.

7. Ventral channel lies **below** the alimentary canal.

8. Lateral channels lie on **either side** of the alimentary canal.

9. Lateral channels serve as **heart**. They have valves.

10. All the four channels are connected together posteriorly in the 26th segment.

11. The channels are filled with blood like fluid called **haemocoelic fluid**.

12. The fluid contains **haemoglobin**.

29. 1. Transport of **respiratory gases** (Oxygen and CO₂).

2. Transport of **digested food** materials.

3. Transport of **hormones**.

4. Transport of nitrogenous excretory products like-

• **Ammonia** • **Uric acid**

• **Urea**

5. Involved in **protection of the body** and **defence against diseases**.

6. Acts as **buffer**.

7. Regulation of **pH**.

8. Regulation of **body temperature**.

9. Maintains proper **water balance** in the body.

30. Role of Growth Hormone

1. Promotes the **development** and enlargement of the tissue of the **body**.

2. Stimulate the **growth** of **muscles**, **cartilages** and **long bones**.

3. **Control the cell metabolism**

4. **Cell regeneration**

Disorders of GH

1. **Dwarfism** 3. **Acromegaly**

2. **Gigantism**

1. Dwarfism

♣ It is caused due to **less secretion** of growth hormone in children.

- * Characteristic features include:
 - *Stunted growth*
 - *Delayed* skeletal formation
 - *Retarded* sexual development
 - *Mental disability*

2. Gigantism

- ♣ *Excess secretion* of growth hormone in *children* leads to gigantism.
- ♣ Characteristic features include:
 - *Over growth* of all body tissues and organs.
 - *Thick toes* and *fingers*.
 - *Very large* hands and feet.
 - *Delayed puberty*.
 - *Coarse facial features*.

3. Acromegaly

- ♦ *Excess secretion* of growth hormone in *adults* leads to Acromegaly.
- ♦ Characteristic features include:
 - * Abnormal *enlargement* of *head, face, hands* and *feet*.
 - * *Deep voice*
 - * Protruding lower jaw and brow
 - * *Enlarged nose*

31. F₁ Generation

1. Tall plants
2. Heterozygous -Tt

F₂ Generation

1. Phenotypic ratio = **3:1**
 - 3 - Tall plants
 - 1 - Dwarf plant
2. Genotypic ratio = **1:2:1**
 - Homozygous dominant-TT-1
 - Heterozygous - Tt -2
 - Homozygous recessive-tt-1

Explanation

It is a *monohybrid experiment*

1. Pure breeding *tall* plant - TT is crossed with a pure breeding *dwarf* plant - tt.
2. Seeds from the crossed pure breeding parents are collected.
3. These seeds are raised into F₁ generation.
4. The F₁ plants are called *monohybrids*. They are *tall*.
5. F₁ monohybrids are self crossed to produce the *F₂ generation*.
6. *Tall* and *dwarf* plants are obtained.

