CLASS 12

CBSE

PHYSICS WALLAH

12 SAMPLE QUESTION PAPERS

NEW PATTERN

As per Latest CBSE SQP (Dated 30th July, 2025)

BIOLOGY

With CBSE SQP & 2025 Solved Papers

2026 EXAMINATION

Additional Features

- 13 Cheat Sheets (Mindmap)
- 3 SQPs with Handwritten Solutions

How to Rock Your Board Exams?

Admit Card: Double-check your admit card before heading to the exam center.

Stationary: Bring pens, pencils, erasers, sharpeners, ruler, and a geometry box. Ensure working pens with sufficient ink and carry spares.

Water bottle and wrist watch: Bring a transparent water bottle for hydration and a wrist watch to monitor time; avoid digital watches which may not be permitted.

Arrive Early at the Examination Center: Arrive before your admit card's reporting time for smooth security checks and room location.

Read the Instructions carefully: Read the instructions of the paper carefully to know the format, marking and special guidelines. Ask the invigilator for any doubts about instructions.

Manage your Time: Assign time for each section/question based on allotted marks and adhere to it for effective time management.

Don't Panic: If you find the paper difficult, remember that everyone else is likely feeling the same way. Stay focused, do your best, and don't let anxiety take over.

Start with your Strengths: Start with your strongest section/question to boost confidence for tougher parts.

Answer clearly and neatly: Write neatly, use headings, subheadings, and bullets for clarity and fetching more marks. Start with margins on both sides. This sets a structured format for your answers.

Don't spend too much time on one question: If a question is challenging or time-consuming, move on and revisit it later if possible. Avoid getting stuck on a single question.

Use of HB pencil: HB pencils produce a relatively dark and easily readable mark. Try to use HB pencils while making diagrams in the exam.

Attempt all questions: Even if unsure, attempt all questions; there is no negative marking in CBSE exams.

SELF ASSESSMENT SHEET

Self-assessment plays a crucial role in exam preparation and offers several advantages:

- **Enhanced Self-awareness:** Self-assessment sheets help students gain a deeper understanding of their strengths and weaknesses across various subjects. Specific feedback on their performance provides valuable insights into areas of excellence and those that require improvement.
- **Focused Study:** These sheets provide clear guidance to students on where to direct their efforts. Identifying which questions to review, reattempt, or practice allows for more efficient and purposeful study sessions.
- **Targeted Improvement:** By categorizing questions into different categories (e.g., Easy, Revise, Reattempt), students can concentrate on areas that require the most attention. This targeted approach can result in significant improvements in their comprehension and performance.
- **Motivation:** Self-assessment sheets serve as a source of motivation for students. Observing their progress and understanding the steps needed for improvement can boost their motivation to work harder and achieve better results.
- **Reduced Exam Anxiety:** Having a clear understanding of their preparation progress helps reduce exam-related anxiety. Students feel more confident when they know what aspects to focus on, leading to a calmer and more effective exam experience.
- **Time Management:** Self-assessment sheets aid students in managing their study time more effectively. They can allocate more time to areas requiring extensive revision or reattempt while spending less time on topics they have already mastered.

Self evaluation Instruction: After completing the test, evaluate it using the provided explanations. Use only a pencil to mark the evaluations (allowing for revisions and reattempts). Record the marks obtained in the Marks section and provide remarks in the Remarks column.

Remarks abbreviations:

- **Easy (E):** Use for questions that you should find straightforward, indicating a good understanding and correct answers.
- **Revise (R):** Assign to questions where your response contains minor errors or gaps in understanding, suggesting the need for topic review.
- **Reattempt (RA):** Use for questions with incorrect responses, significant misconceptions, or a lack of understanding. Students receiving this remark should revisit the topic thoroughly, seek additional help if necessary, and attempt similar questions to enhance their grasp of the concept.

	SQP 1		SQP 2		SQP 3		SQP 4		SQP 5	
S.No.	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks
Q.1										
Q.2										
Q.3										
Q.4										
Q.5										
Q.6										
Q.7										
Q.8										
Q.9										
Q.10										
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Q.19										
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Q.21										
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Q.24										
Q.25										
Q.26										
Q.27										
Q.28										
Q.29										
Q.30										
Q.31										
Q.32										
Q.33										
Total										

Comparative Analysis

BIOLOGY						
CHAPTERS	2024 Paper		2025 Paper		Sample Question Paper 2025-26	
	Question Typology	Total Marks*	Question Typology	Total Marks*	Question Typology	Total Marks*
Sexual Reproduction in Flowering Plants	2 MCQ, 1A/R, 1 SA, 1 LA	11	2 MCQ, 1 CASE-BASED, 1 LA	11	2 MCQ, 1 A/R, 1 VSA, 1 CASE-BASED	9
Human Reproduction	1 SA, 1 LA	8	2 VSA, 1 LA	9	1 MCQ, 1 SA	4
Reproductive Health	1 VSA	2	1 SA	3	1 SA	3
Principles of Inheritance and Variation	2 MCQ, 1 SA, 1 LA	10	1 MCQ, 1 A/R, 1 VSA, 1 LA	9	1 MCQ, 1 SA	4
Molecular Basis of Inheritance	2 MCQ, 1 A/R, 1 VSA, 1 LA	10	1 MCQ, 1 A/R, 1 SA, 1 LA	10	3 MCQ, 1 VSA, 2 LA	15
Evolution	2 MCQ, 1 SA	5	1 MCQ, 1 VSA, 1 SA	6	2 MCQ, 1 A/R, 1 SA	6
Human Health and Disease	1 MCQ. 1 A/R, 1 VSA, 1 LA	9	2 MCQ, 2 VSA, 1 SA	9	1 MCQ, 1 A/R, 1 VSA, 1 CASE-BASED	8
Microbes in Human Welfare	1 SA	3	1 A/R, 1 CASE-BASED	5	1 MCQ, 1 SA	4
Biotechnology: Principles and Processes	2 MCQ. 1 A/R, 1 VSA, 1 CASE-BASED	9	1 MCQ, 1 A/R	2	1 MCQ, 2 LA	11
Biotechnology and its Applications	1 SA	3	2 MCQ, 2 VSA, 2 SA	12	1 A/R, 1 VSA, 2 SA	9
Organisms and Populations	1 MCQ, 1 SA, 1 CASE-BASED	8	1 MCQ, 1 LA	6	1 SA, 1 LA	8
Ecosystem	1 VSA	2	1 SA	3	1 VSA	2
Biodiversity and Conservation	1 VSA	2	1 MCQ, 1 LA	9	1 VSA, 1 LA	7

**The marks allotment mentioned above is chapter-wise and includes internal choice questions as well. Therefore, the total might not match the Maximum Marks of the respective Previous Year Paper/CBSE Sample Question Paper.*

CONTENTS

I. Cheat Sheets

II. Sample Question Papers

III. Explanation

IV. CBSE Solved Papers

CHAPTER-1

Sexual Reproduction in Flowering Plants

Pre-fertilisation: Structures and Events

Gametogenesis / Gamete Formation
Occurs in specialised structures: anthers (male) and ovules (female).

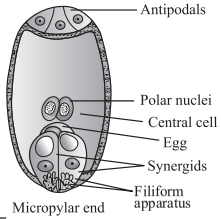
Gamete transfer through pollination
Transfer of pollen grains to stigma of a pistil for fertilisation.

Megasporogenesis and Monosporic Embryo sac Development

Megaspore mother cell (2n)
↓ Meiosis
Megaspore tetrad i.e., 4 Megaspores (n)
↓
A single chalazal megaspore is functional; rest degenerate
↓
Functional Megaspore (n)
↓ 1st nuclear division
Two nucleated stage
↓ 2nd nuclear division
Four nucleated stage
↓ 3rd nuclear division
Eight nucleated stage
↓ Cell walls are now laid down, forming 8 nucleated, 7-celled embryo sac

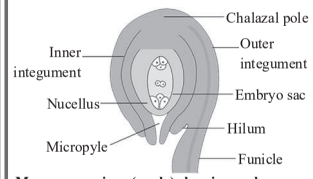
These divisions are strictly free nuclear and no cell walls are laid yet

Development of embryo sac from a single megaspore (monosporic development)



Ovule

- Ovule usually has a single embryo sac formed from a megaspore.



Megasporangium (ovule) showing embryo sac

Biotic Agent

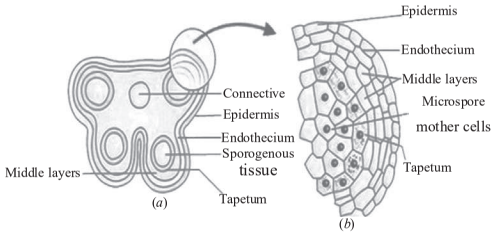
Insects (Bees, butterflies, flies, ants, wasps, etc.), birds (sunbirds humming birds), bats, some primates (lemurs), arboreal rodents, and reptiles (gecko lizard and garden lizard), etc.

Floral Adaptation

- **Nectar Production:** Flowers produce nectar to attract pollinators.
- **Color and Scent:** Bright colors and fragrances lure pollinators.
- **Mimicry:** Some flowers mimic female insects to facilitate pollination e.g., *Ophrys*
- **Offers Oviposition (egg-laying) site:** In some species floral rewards are in providing safe places to lay eggs; Some flowers, like the 6-feet *Amorphophallus* and *Yucca*.

Structure of Microsporangium

- Each microsporangium has four wall layers (**epidermis**, **endothecium** and **middle layers** protect the microsporangium and aid in anther dehiscence and the **tapetum** nourishes developing pollen grains) and a central sporogenous tissue that gives rise to pollen grains.

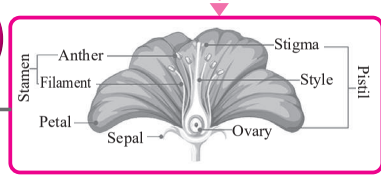


(a) T.S. of Young Anther **(b) Enlarged view of Microsporangium**

Microsporogenesis and Microgametogenesis:

Pollen mother cell (2n) —Meiosis→ Microspore tetrad i.e., 4 microspores (n)
↓ Anther matures and dehydrates
4 Pollen grains (n) or Male gametophyte
—Pollen mitosis I (Unequal division)→ Vegetative cell (n) + Generative cell (n)
Generative cell (n) —Pollen mitosis II→ Male gamete (n) + Male gamete (n)

Flower-A Fascinating Organ of Angiosperms



Female Reproductive Part (Pistil)

- Gynoecium in a flower represents the female reproductive part.
- It can be a single pistil (monocarpellary) or multiple pistils (multicarpellary).
- Pistils may be fused (syncarpous) or separate (apocarpous).

Male Reproductive Part (Stamen)

- Comprises a filament and a bilobed anther.
- Anther is dithecous, containing four microsporangia that become pollen sacs.

Pollinating agents

Abiotic Agents: Wind, Water

Wind pollinated flower

- Flowers are not colorful and do not produce nectar.
- Pollen grains are light and non-sticky.
- Have exposed stamens and large feathery stigmas to facilitate pollen dispersal and capture, e.g., grasses.

Water pollinated flower

- Flowers are not very colorful and do not produce nectar.
- Pollen grains are long, ribbon like released inside water and are carried passively; some of them reach the stigma and achieve pollination.
- E.g., *Vallisneria*, *Hydrilla* and *Zostera*.

Cross pollination

Xenogamy

- Cross-pollination between different flowers on different plants.

Self pollination

Geitonogamy

- Pollination between different flowers on the same plant.
- Geitonogamy is functionally cross-pollination but genetically self-pollination.

Autogamy

- Self-pollination within the same flower
- Ensures fertilisation but reduces genetic diversity.
- Requires perfect synchrony in pollen release and stigma receptivity.
- Some plants like *Viola* (Common Pansy), *Oxalis*, and *Commelina* produce chasmogamous (with exposed anthers and stigma, allowing cross-pollination) and cleistogamous (flowers do not open and ensure autogamy) flowers.

Pollen Grain (25-50 μm in diameter)

Component	Main Function	Location
Exine (made of sporopollenin)	Provides protection due to its resistance to extreme conditions and aids in the preservation of pollen grains as fossils.	Outer layer of the pollen grain wall.
Intine (made of cellulose and pectins)	Essential for the maturation of the pollen grain and pollen tube germination.	Inner layer of the pollen grain wall, beneath the exine.
Germ pores	Serve as sites for pollen tube emergence, facilitating the process of germination.	Specific regions on the exine where sporopollenin is absent.
Vegetative cell	Provides nutrients and energy for the growth of the pollen tube.	Larger cell within the pollen grain, contains a large nucleus and abundant food reserves.
Generative cell	Divides mitotically to produce two male gametes for fertilisation.	Smaller cell that floats in the cytoplasm of the vegetative cell, typically spindle-shaped.

- Some plants release **2-celled pollen** (one generative and one vegetative cell), while others disperse **3-celled pollen** (one vegetative and two male gametes).

Microsporogenesis pollen yield:

$$P = N \times 4$$

(∵ each microspore mother cell produces 4 microspores/pollens)

where,

P = Number of pollen grains

N = Number of microspore mother cell

Pollen Viability and Storage:

- Pollen viability varies, influenced by temperature and humidity.
- Rice, wheat pollen: lose viability within 30 minutes of their release.
- Pollen in some members of Rosaceae, Leguminoseae, Solanaceae: viable for months.
- Pollen can be stored for years in liquid nitrogen (-196°C), can be used as pollen banks in crop breeding programmes.

Cheat Sheet

To Access One Shot Revision Video Scan This QR Code

Roll No. | | | | | | | | |

Q.P. Code **01**

Candidates must write the Q.P. Code on the title page of the answer-book.

SAMPLE QUESTION PAPER- I
BIOLOGY

Time allowed: 3 hours | Maximum Marks: 70

NOTE:

*(i) Please check that this question paper contains **33** questions.*

(ii) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

*(iii) **Please write down the Serial Number of the question in the answer-book at the given place before attempting it.***

(iv) 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions:

Read the following instructions carefully and follow them:

*(i) This question paper contains **33** questions. **All** questions are **compulsory**.*

*(ii) Question paper is divided into **five** sections - Sections **A**, **B**, **C**, **D** and **E**.*

*(iii) **Section A** - questions number **1** to **16** are multiple choice type questions. Each question carries **1** mark.*

*(iv) **Section B** - questions number **17** to **21** are very short answer type questions. Each question carries **2** marks.*

*(v) **Section C** - questions number **22** to **28** are short answer type questions. Each question carries **3** marks.*

*(vi) **Section D** - questions number **29** and **30** are case-based questions. Each question carries **4** marks. Each question has subparts with internal choice in one of the subparts.*

*(vii) **Section E** - questions number **31** to **33** are long answer type questions. Each question carries **5** marks.*

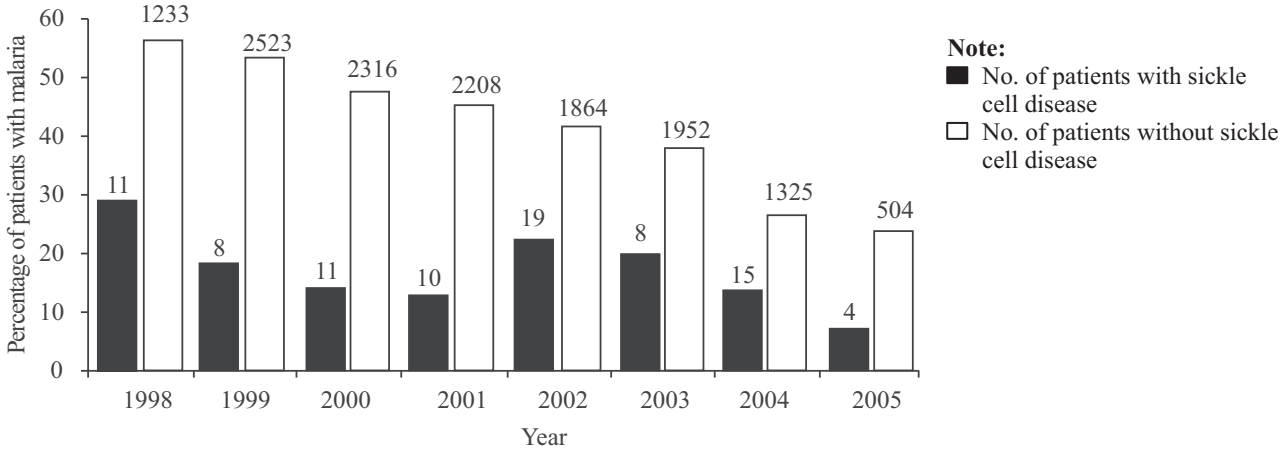
(viii) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(ix) Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION - A

Questions no. ***1*** *to* ***16*** *are Multiple Choice Type Questions, carrying* ***1*** *mark each. Choose the best option.* ***16 × 1 = 16***

1. The provided graph illustrates the incidence of malaria among individuals with and without Sickle Cell Disease (SCD) in Kenya from 1998 to 2005.



The following statements are drawn as conclusions from the above data.

I. Patients with SCD (Sickle Cell Disease) are less likely to be infected with malaria.

II. Patients with SCD (Sickle Cell Disease) are more likely to be infected with malaria.

III. Over the years the percentage of people infected with malaria has been decreasing.

IV. Year 2000 saw the largest percentage difference between malaria patients with and without SCD.

Choose the correct option.

(*a*) Only I is true (*b*) I and IV are true (*c*) II and III are true (*d*) I and III are true

2. Select the correct arrangement of countries in sequence of biodiversity of bird species-

	1400 bird species	**1200 bird species**	**105 bird species**	**56 bird species**
(*a*)	Colombia	Greenland	India	New York
(*b*)	India	New York	Greenland	Colombia
(*c*)	Colombia	India	New York	Greenland
(*d*)	New York	India	Colombia	Greenland

3. Non-albuminous seeds are present in

(*a*) Maize (*b*) Wheat (*c*) Rice (*d*) Groundnut

4. Identify the incorrect pair of evolutionary concepts and examples provided in each option.

(*a*) Divergent evolution- Forelimbs of whales, bats, cheetah and human

(*b*) Convergent evolution- Flippers of penguins and dolphins

(*c*) Homologous structures-Vertebrate hearts

(*d*) Analogous structures- Thorns and tendrils of *Bougainvillea* and *Cucurbita*

5. A person with trisomy of 21st chromosome shows

(*i*) Furrowed tongue (*ii*) Characteristic palm crease

(*iii*) Rudimentary ovaries (*iv*) Gynaecomastia

Select the correct option, from the choices given below:

(*a*) (*ii*) and (*iv*) (*b*) (*i*), (*ii*) and (*iv*) (*c*) (*ii*) and (*iii*) (*d*) (*i*) and (*ii*)

6. A murder has occurred, and you are asked to help solve it. The police bring you a sample from the crime scene of what they believe is the killer's DNA and ask you for a chemical analysis. Your study of this sample reveals the presence of adenine, thymine, ribose, and uracil, leading you to conclude that the sample is

(*a*) Pure DNA (*b*) Pure RNA

(*c*) Probably a mixture of DNA and RNA (*d*) Probably a mixture of rRNA and mRNA

7. Select the incorrect option from the following.

(*a*) Alpine meadows has a greater ecosystem diversity than a Scandinavian country like Norway.

(*b*) There are 50,000 varieties of mango present in India.

(*c*) Robert May places the global species diversity at about 7 million.

(*d*) Western Ghats have a greater amphibian species diversity than the Eastern Ghats.

8. Match the levels of productivity with their definitions and choose the correct option.

Column-A (Levels of Productivity)		**Column-B (Definitions)**	
(*i*)	Gross Primary Productivity (GPP)	*A*.	Biomass available for consumption to heterotrophs
(*ii*)	Net Primary Productivity (NPP)	*B*.	Rate of new organic matter formation by consumers
(*iii*)	Secondary Productivity	*C*.	Rate of production of organic matter during photosynthesis
		D.	GPP minus respiration losses

Options:

(*a*) (*i*) - *C*; (*ii*) - *D*; (*iii*) - *A*, *B* (*b*) (*i*) - *A*; (*ii*) - *C*, *D*; (*iii*) - *B*

(*c*) (*i*) - *C*; (*ii*) - *A*, *D*; (*iii*) - *B* (*d*) (*i*) - *C*; (*ii*) - *B*, *D*; (*iii*) - *A*

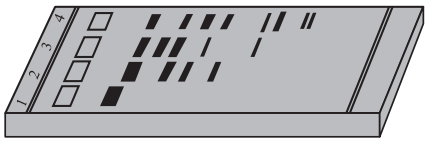
9. If the gel electrophoresis experiment was allowed to run for a longer duration, what would happen to the bands in Well 4?

(*a*) They will move closer to the wells.

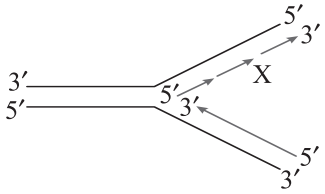
(*b*) They will remain stationary.

(*c*) They will move farther from the wells.

(*d*) They will disappear.



10. Why does strand X show discontinuous synthesis?



(*a*) Because DNA synthesis can only occur in the 3′ to 5′ direction.

(*b*) Because the lagging strand runs 5′ to 3′ towards the fork.

(*c*) Because DNA polymerases catalyse polymerisation only in 5′ to 3′ direction.

(*d*) Because the leading strand runs 3′ to 5′ towards the fork.

11. At a particular locus, the frequency of allele A is 0.8 and that of allele a is 0.2. What would be the frequency of heterozygotes in a random mating population at equilibrium?

(*a*) 0.32 (*b*) 0.16 (*c*) 0.24 (*d*) 0.48

12. Which of the following phases of the menstrual cycle is characterised by a surge in luteinizing hormone (LH)?

(*a*) Follicular phase (*b*) Ovulatory phase (*c*) Luteal phase (*d*) Menstrual phase

SAMPLE QUESTION PAPER-I
(Explanations)

1. (*d*) The graph shows that the percentage of malaria in patients with SCD is consistently lower than in those without SCD. This supports Statement I. The overall trend indicates a decrease in malaria infections over the years, supporting Statement III. However, Statement II contradicts I, and there's no clear largest difference in 2000 as mentioned in IV. ***(1 M)***

2. (*c*) Tropical regions host a rich biodiversity. For instance, Colombia near the equator has 1,400 bird species, contrasting with New York (41°N) with 105 and Greenland (71°N) with 56. India, predominantly tropical regions has more than 1,200 bird species. ***(1 M)***

3. (*d*) A non-albuminous seed is a type of seed that does not have residual endosperm as it is completely consumed during embryo development, e.g., pea, groundnut, etc. ***(1 M)***

4. (*d*) The thorns and tendrils of *Bougainvillea* and *Cucurbita*, both being plant structures, do not represent analogous structures. They are homologous structures as they share a common origin. ***(1 M)***

5. (*d*) Individuals with trisomy 21, also known as Down syndrome, commonly exhibit a furrowed tongue and characteristic palm crease. ***(1 M)***

6. (*c*) The sample is probably a mixture of RNA and DNA. The logic here is that thymine is unique to DNA, and both ribose and uracil are found only in RNA. ***(1M)***

7. (*b*) India has approximately 1,000 varieties of Mango. ***(1 M)***

8. (*c*) Gross Primary Productivity (GPP) is the rate of production of organic matter during photosynthesis. Net Primary Productivity (NPP) is the biomass available for consumption to heterotrophs and equals GPP minus respiration losses. Secondary Productivity is the rate of new organic matter formation by consumers. ***(1 M)***

9. (*c*) Over time, DNA bands will continue to migrate towards the positive electrode during gel electrophoresis. ***(1 M)***

10. (*c*) DNA-dependent DNA polymerase catalyses polymerisation only in the 5′ to 3′ direction. The lagging template strand runs 5′ to 3′ towards the replication fork, which means that DNA polymerase cannot synthesize a new strand continuously in this direction. Therefore, the lagging strand (X) is synthesized discontinuously in short fragments (Okazaki fragments), which are later joined together. ***(1 M)***

11. (*a*) Using the Hardy-Weinberg principle, the frequency of heterozygotes (Aa) in a random mating population is 2pq. Given p = 0.8 and q = 0.2, the frequency is $2 \times 0.8 \times 0.2 = 0.32$. ***(1 M)***

12. (*b*) During the ovulatory phase of the menstrual cycle, there is a surge in luteinizing hormone (LH) from the anterior pituitary gland. This surge stimulates the release of a mature egg from the ovary, a process known as ovulation. ***(1 M)***

13. (*a*) The government has implemented measures such as raising the marriageable age and providing incentives to couples with small families to address the issue of population growth. ***(1 M)***

14. (*a*) The change in the moth population over time, with a shift towards moths that matched the changing background colour of tree trunks due to industrialization, illustrates the process of natural selection where advantageous traits lead to increased survival and reproductive success in a changing environment. ***(1 M)***

15. (*d*) The ploidy of the megaspore mother cell (MMC) is diploid (2*n*), and it undergoes meiotic division to produce 4 haploid megaspores. ***(1 M)***

16. (*c*) Alexander Fleming while working on *Staphylococci* bacteria, once observed a mould growing in one of his unwashed culture plates around which bacteria could not grow. He found that it was due to a chemical produced by mould and he named it Penicillin after the mould *Penicillium notatum*. Its full potential was established by Ernest Chain and Howard Florey. ***(1 M)***

17. (*a*) In the diagram, (1) is a producer that converts solar energy into chemical energy via photosynthesis. They form the base of the energy flow. ***(1M)***

(*b*) Dead Top Predator (4) → Decomposers (Bacteria and Fungi) → Inorganic Nutrients (CO_2, H_2O, Minerals) → Plant Uptake (1) → Primary Production through Photosynthesis → Energy Transfer to Consumers. ***(1M)***

18. (*a*) The genotype of the man (blood group A) can be either I^AI^O or I^AI^A. The woman's genotype (blood group B) can be I^BI^O or I^BI^B. ***(1 M)***

(*b*) The AB blood group in their child results from the co-dominance of the A and B alleles. The child inherited one A allele from the man and one B allele from the woman, resulting in the AB blood group. ***(1 M)***

(*b*) Two intrauterine contraceptive devices (IUDs) that affect the motility of sperm are:

Cu-T and Multiload 375 are intrauterine contraceptive devices (IUDs) that contain copper. They work by releasing copper ions in the uterine environment, which suppress sperm motility and reduce their fertilizing capacity, contributing to effective contraception. ***(1 M)***

Topper's Explanation **(CBSE 2016)**

(a) The characteristics of an ideal contraceptive are –
- should be user friendly
- should be effective with least or no side effects
- should be reversible
- should not interfere in any way with the sexual drive of the user.

(b) Copper Releasing IUD's (eg. CuT, Cu7, Multiload 375) supress sperm motility

26. Fitness refers to the outcome of an organism's adaptation, where its ability to produce offspring with advantageous traits for survival and reproduction is enhanced. ***(1 M)***

Natural selection is a mechanism by which heritable traits that confer greater success in a given environment become more prevalent over generations, illustrating the process through which advantageous traits are favoured and passed on. ***(1 M)***

In essence, fitness is the consequence/result of successful adaptation, while natural selection is the dynamic process that drives the persistence of adaptive traits in a population over time. ***(1 M)***

27. (*a*) **Pollination in *Vallisneria***

Female flowers reach the water surface through long stalks. ***(1 M)***

Male flowers get detached and float on the water surface, where water currents carry them to the stigmas for pollination. ***(1 M)***

Pollination difference in water lily

In water-lily, flowers bloom above the level of water and pollination occurs through insects or wind, not by water currents. ***(1 M)***

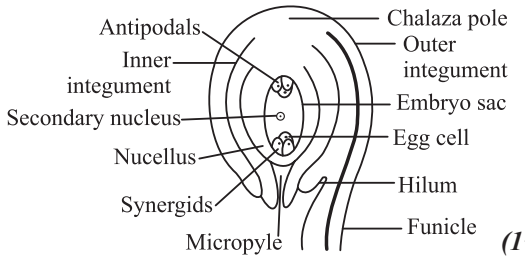
Topper's Explanation **(CBSE 2017)**

Vallisneria shows hydrophilic pollination ie, pollination is done with the help of water as bar agent.
Vallisneria is an aquatic plant, found in freshwaters.
It shows epihydrophily ie, pollination occurs at the surface of water. The female flowers reach the surface of water by their long stalks. Male flowers or pollen grains are also released on to the surface of water, which are carried passively by water currents. Some pollen grains reach the stigma of female flower and effects pollination (The pollen grains are covered with mucilagenous covering to avoid wetting.)

Water - lily, although being an aquatic plant, is pollinated by wind or some insects as in the case of terrestrial plants. This is because the flowers of water - lily are present much above the surface of water / water level. Hence hydrophily do not occur.

OR

(*b*) An anatropous ovule comprises of:
- A connecting stalk called the funicle, attaches ovule to the placenta.
- The junction between the funicle and the ovule is known as the hilum.
- Surrounding the ovule, there may be one or two integuments, with an opening at the tip referred to as the micropyle.
- The opposite end of the micropyle is known as the chalazal end, which is the basal part of the ovule. Inside the integuments, there is a mass of cells called the nucellus, and within this structure, a single embryo sac is typically found. ***(1½ M)***



(1½ M)

28. (*a*) Name of the enzyme: *Bam*HI
- The convention used to name a restriction enzyme is that the first letter comes from the genus (*Bacillus*) and next two letters from the species (*amyloliquefaciens*).
- The fourth letter refers to the strain (strain H).
- The roman number in the end indicates the order in which the enzyme was isolated from the strain (first enzyme). ***(2 M)***

(*b*) 5′-G G A T C C- 3′
3′-C C T A G G- 5′ ***(1 M)***

29. (*a*) Marshall Nirenberg proved the codon is a triplet by using synthetic RNA sequences in a cell-free system, demonstrating how three nucleotides code for one amino acid in protein synthesis. ***(1 M)***

(*b*) George Gamow suggested that in order to code for all the 20 amino acids, the code should be made up of three nucleotides. ***(1 M)***

(*c*) (*i*) There are 20 standard amino acids used to build proteins. Since there are only four different nucleotides in DNA and RNA (adenine, thymine/

CBSE SAMPLE QUESTION PAPER

(Issued by CBSE on 30th July, 2025)

Class-XII Session: 2025-26

BIOLOGY (044)

Time allowed: 3 hours | Maximum Marks: 70

General Instructions:

(*i*) ***All** questions are **compulsory.***

(ii) The question paper has five sections and 33 questions.

*(iii) **Section–A** has **16** questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.*

(iv) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION - A

*Q. No. **1** to **12** are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.*

1. The male gametes are formed by:

(*a*) Mitotic division of nucleus of vegetative cell (*b*) Meiotic division of nucleus of vegetative cell

(*c*) Mitotic division of nucleus of generative cell (*d*) Meiotic division of nucleus of generative cell

Sol. (*c*) Mitotic division of nucleus of generative cell **(*1 M*)**

2. The primary endosperm nucleus is formed by fusion of which of the following?

(*a*) A male gamete and a female gamete (*b*) A male gamete and two polar nuclei

(*c*) A female gamete and two synergids (*d*) Two male gametes and an egg cell

Sol. (*b*) A male gamete and two polar nuclei **(*1 M*)**

3. During the menstrual cycle of a human female, formation of graafian follicle is stimulated by secretion of which of the following gonadotropin hormones?

(*a*) Estrogen and progesterone (*b*) FSH and Estrogen

(*c*) FSH and LH (*d*) Progesterone and LH

Sol. (*c*) FSH and LH **(*1 M*)**

4. The experimental proof on the thermal stability of genetic material was first provided by experiments of

(*a*) Hershey and Chase (*b*) Meselson and Stahl

(*c*) Frederick Griffith (*d*) Jacob and Monod

Sol. (*c*) Frederick Griffith **(*1 M*)**

5. Short stretches of DNA used to identify complementary sequences in a sample are called

(*a*) Probes (*b*) Markers (*c*) Primers (*d*) Minisatellites

Sol. (*a*) Probes **(*1 M*)**

6. Select the **incorrect statement** among the following.

(*a*) $p^2 + 2p\,q + q^2 = 1$. This is binomial expansion of $(p + q)^2$.

(*b*) When frequency measured differs from expected values, the difference (direction) indicates the extent of evolutionary change.

(*c*) Hardy-Weinberg principle says that phenotype frequencies in a population are stable and are constant from generation to generation.

(*d*) The gene pool (total genes and their alleles in a population) remains constant. This is called genetic equilibrium. Sum total of all the allelic frequencies is 1.

Sol. (*c*) Hardy-Weinberg principle says that phenotype frequencies in a population are stable and are constant from generation to generation. ***(1 M)***

7. Albinism is known to be due to an autosomal recessive mutation. The first child of a couple with normal skin pigmentation was an albino. What is the probability that their second child will also be an albino?

(*a*) 100% (*b*) 25% (*c*) 50% (*d*) 75%

Sol. (*b*) 25% ***(1 M)***

8. "In Cricket species, the sound produced by rubbing the wings or legs together play a crucial role in attracting mates, any change in the morphology of Cricket legs could potentially affect their ability to produce sound".

A mutant Cricket had thicker hind legs. What would you expect for this cricket species?

(*a*) The leg mutation will not lead to speciation if they diversify into new habitats.

(*b*) The leg mutation will have little effect on other external features, and therefore have little effect on speciation.

(*c*) The leg mutation will have no effect on behavior, and thus have little effect on speciation.

(*d*) The leg mutation might lead to reproductive isolation and speciation due to an effect on the mating call.

Sol. (*d*) The leg mutation might lead to reproductive isolation and speciation due to an effect on the mating call. ***(1 M)***

9. *Plasmodium* is a pathogen that causes malaria. Identify the correct sequence of transmission of the pathogen.

	I **Stage of pathogen as it is transferred by vector bite**	**II** **First site in the host body where the pathogens infect and proliferates**	**III** **Second site in the host body where the pathogen infects and manifests clinical symptoms**	**IV** **Stage of pathogen as it is transferred to a new vector**
A	Sporozoites	Erythrocyte infection	Liver infection	Gametocytes
B	Gametocytes	Erythrocyte infection	Liver infection	Sporozoites
C	Gametocytes	Liver infection	Erythrocyte infection	Sporozoites
D	Sporozoites	Liver infection	Erythrocyte infection	Gametocytes

Sol. (*d*) Sporozoites, Liver infection, Erythrocyte infection, Gametocytes ***(1 M)***

10. Which mRNA will be translated to a polypeptide chain containing 8 amino acids?

(*a*) AUGUUAAUAGACGAGUAGCGACGAUGU (*b*) AUGAGACGGACUGCAUUCCCAACCUGA

(*c*) AUGCCCAACCGUUAUUCAUGCUAG (*d*) AUGUCGACAGUCUAAAACAGCGGG

Sol. (*b*) AUGAGACGGACUGCAUUCCCAACCUGA ***(1 M)***

11. In order to isolate genetic material of a bacterium, the cell must be treated with

(*a*) Lysozyme, ribonuclease, protease, chilled ethanol (*b*) Cellulase, ribonuclease, protease, chilled ethanol

(*c*) Chitinase, ribonuclease, chilled ethanol, water (*d*) Ribonuclease, protease, chilled ethanol, water

Sol. (*a*) Lysozyme, ribonuclease, protease, chilled ethanol ***(1 M)***

12. Integrated Pest Management involves

I. Using pesticides/insecticides judiciously

II. Using biocontrol agents

III. Engaging in organic farming

(*a*) Only I (*b*) Only II (*c*) Both I and II (*d*) Only III

Sol. (*c*) Both I and II ***(1 M)***

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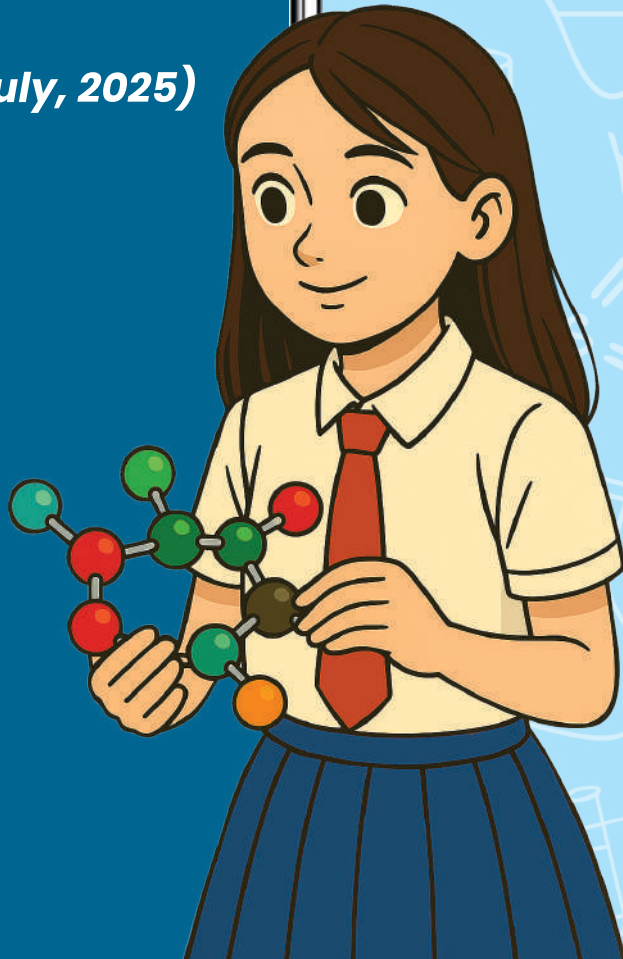

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