mtG

CLASS 12

ScoreMore

CASE STUDY Questions

750+ CHAPTERWISE Practice Questions FOR CBSE BOARD 2021

- Case Study / Passage Based
- Assertion & Reason

BIOLOGY

Over 750 Questions & Solutions
Developed to familiarize you with the ***NEW CBSE PATTERN***

QUESTION PAPER DESIGN 2020-21#

S. No.		Chapter	VSA /Case based/ AR (1 mark)	SA-I (2 marks)	SA-II (3 marks)	LA (5 marks)	Total	
1.	Unit-VI	Sexual Reproduction in Flowering Plants	3(3)	–	–	–	**3(3)**	**14**
2.		Human Reproduction	1(1)	–	1(3)	1+1*(5)	**3(9)**	
3.		Reproductive Health	–	1(2)	–	–	**1(2)**	
4.	Unit-VII	Principles of Inheritance and Variation	3+1*(6)	1(2)	1(3)	–	**5(11)**	**18**
5.		Molecular Basis of Inheritance	2(2)	–	–	1 +1*(5)	**3(7)**	
6.	Unit-VIII	Human Health and Diseases	–	–	–	1+1*(5)	**1(5)**	**14**
7.		Microbes in Human Welfare	1(4)	1(2)	1(3)	–	**3(9)**	
8.	Unit-IX	Biotechnology : Principles and Processes	2(2)	3+1*(6)	–	–	**5(8)**	**12**
9.		Biotechnology and Its Applications	1(1)	1*	1(3)	–	**2(4)**	
10.	Unit-X	Organisms and Populations	1(1)	1(2)	1+1*(3)	–	**3(6)**	**12**
11.		Biodiversity and Conservation	2(2)	2(4)	–	–	**4(6)**	
		Total	**16(22)**	**9(18)**	**5(15)**	**3(15)**	**33(70)**	

*It is a choice based question.

★ *This chapter is not a part of the Board Examination 2020-21 syllabus*

For latest information please refer to www.cbse.nic.in

CHAPTER
2

Sexual Reproduction in Flowering Plants

CASE STUDY / PASSAGE BASED QUESTIONS

1

Read the following and answer any four questions from 1(i) to 1(v) given below:
The pollen grains or microspores are the male reproductive bodies of a flower and are contained in the pollen sac or microsporangia. Each pollen grain consists of a single microscopic cell, possessing two coats : the exine and the intine. The exine of a pollen grain is made of chemically stable material. Because of this, pollen grains are often very well preserved for thousands of years in soil and sediments.

(i) One of the most resistant biological material present in the exine of pollen grain is
(a) pectocellulose (b) sporopollenin
(c) suberin (d) cellulose.

(ii) The exine possesses one or more thin places known as
(a) raphe (b) germ pores
(c) hilum (d) endothecium.

(iii) What is the function of germ pore?
(a) Emergence of radicle
(b) Absorption of water for seed germination
(c) Initiation of pollen tube
(d) All of these

(iv) What is the key advantage to the plant for having such strong pollen grain walls?
(a) It protects the vital genetic material in the pollen grain.
(b) It allows pollen to serve as a valuable fossil record for the study of ancient plants.
(c) It prevents the pollen tube from growing out before the pollen grain reaches the stigma of a compatible species.
(d) It gives weight to the pollen grain, allowing it to cling better to the body surfaces of insect pollinators.

(v) The number of germ pores in dicots and monocots respectively are
(a) one and three
(b) three and two
(c) two and three
(d) three and one.

Syllabus
Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

(iii) Milk of tender coconut represents (i) and the surrounding white coconut meal represents (ii) .

	(i)	**(ii)**
(a)	cellular endosperm	free-nuclear endosperm
(b)	free-nuclear endosperm	cellular endosperm
(c)	helobial endosperm	cellular endosperm
(d)	free-nuclear endosperm	helobial endosperm

(iv) If an endosperm cell of a gymnosperm contains 12 chromosomes, the number of chromosomes in each cell of the root will be

(a) 4 (b) 24 (c) 16 (d) 6.

(v) In angiosperms, normally after fertilisation

(a) the zygote divides earlier than the primary endosperm nucleus

(b) the primary endosperm nucleus divides earlier than the zygote

(c) both the zygote and primary endosperm nucleus divide simultaneously

(d) both the zygote and primary endosperm nucleus undergo a resting period.

9

Read the following and answer any four questions from 9(i) to 9(v) given below:

Embryo develops at the micropylar end of the embryo sac where the zygote is situated. Most zygotes divided only after certain amount of endosperm is formed. The early stages of embryo development are similar in both monocotyledons and dicotyledons. The zygote gives rise to the proembryo and subsequently to the globular heart-shaped and mature embryo. A typical dicotyledonous embryo consists of an embryonal axis and two cotyledons. Embryo of monocotyledons possess only one cotyledon.

(i) True embryo develops as a result of fusion of

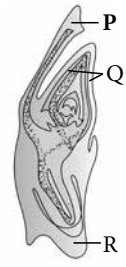
(a) two polar nuclei of embryo sac

(b) an egg cell and a male gamete

(c) synergid and male gamete

(d) a male gamete and antipodals.

(ii) Refer to the given diagram of the embryo of an angiospermous plant with parts labelled P, Q and R. Select the correct statement(s) regarding this.



(i) Part 'P' supplies nutrition to the developing embryo.

(ii) Part 'Q' is the protective sheath of radicle and root cap.

(iii) Part 'R' is the protective sheath of shoot apex and leaf primordia.

(iv) The embryo shown in the diagram is present in members of Family Poaceae.

(a) (iv) only (b) (ii) and (iii) only

(c) (i) and (iv) only (d) (i), (ii), (iii) and (iv)

(iii) Which of the given statements are true?

(i) During the development of a dicot embryo, heart-shaped embryo is followed by globular embryo.

(ii) The part of embryonal axis above the level of cotyledons is epicotyl, while the part below the level of cotyledons is hypocotyl.

(iii) Monocot seeds possess a single cotyledon represented by scutellum.

(a) (i) and (ii) (b) (ii) and (iii)

(c) (i) and (iii) (d) (i), (ii) and (iii)

(iv) Consider the following parts of an embryonal axis of a dicot seed.

(i) Hypocotyl (ii) Epicotyl (iii) Radicle (iv) Plumule

In which of the following the above parts are correctly arranged from top to base?

(a) (iii) → (i) → (ii) → (iv)

(b) (ii) → (i) → (iii) → (iv)

(c) (iv) → (ii) → (i) → (iii)

(d) (iii) → (iv) → (ii) → (i)

(v) In grass family, the cotyledon is called

(a) epiblast (b) plumule

(c) scutellum (d) perisperm.

10

Read the following and answer any four questions from 10(i) to 10(v) given below:

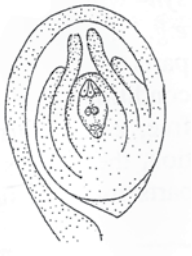
A typical angiospermic ovule is a small structure attached to the placenta by means of a stalk called funicle. The body of the ovule fuses with funicle in the region called hilum. Each ovule has one or two protective envelopes called integuments. Integuments encircle the nucellus except at the tip where a small opening called the micropyle is formed. Mature ovules are classified on the basis of funiculus. It can be orthotropous, anatropous, hemitropous, campylotropous, etc.

(i) The body of the ovule consists of a mass of parenchymatous cells called

(a) integuments (b) nucellus

(c) hilum (d) funiculus.

(ii) Refer to the given figure and select the correct statement regarding it.



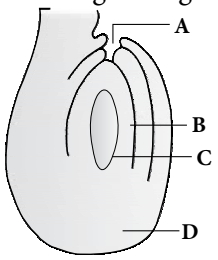
(a) This type of ovule is found in cactus.

(b) The micropyle comes to lie close to the funiculus due to unilateral growth of ovule.

(c) It is most common type of ovule found in the members of Chenopodiaceae.

(d) It is half inverted ovule.

(iii) Identify the parts labelled as A, B, C and D in the given figure and select the correct option.



	A	B	C	D
(a)	Chalaza	Female gametophyte	Embryo sac	Micropyle
(b)	Chalaza	Nucellus	Embryo sac	Micropyle
(c)	Micropyle	Egg	Embryo sac	Chalaza
(d)	Micropyle	Nucellus	Embryo sac	Chalaza

(iv) Mature ovules are classified on the basis of funiculus. If micropyle lie close to the funiculus, the ovule is termed as

(a) orthotropous (b) anatropous (c) hemitropous (d) campylotropous.

(v) In *Asphodelus*, ovule is

(a) unitegmic (b) tritegmic (c) bitegmic (d) ategmic.

ASSERTION & REASON

For question numbers 11-30, two statements are given-one labelled Assertion and the other labelled Reason. Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Both assertion and reason are false

11. Assertion : Perisperm is protective covering of seed and helps in dispersal and nutrition.
Reason : Pericarp is covering of fruit which is non-functional.

12. Assertion : Ubisch bodies are produced by glandular tapetum.
Reason : Ubisch bodies participated in the thickening of exine.

13. Assertion : Anemophily is non-directional.
Reason : Entomophily is highly specific and directional.

14. Assertion : One pollen mother cell forms four microspores.
Reason : Microspores are formed due to reduction division.

15. Assertion : Mostly in a tetrad, all microspores are free.
Reason : Compound pollen grain and pollinium are formed by grouping of microspores.

16. Assertion : Pollen wall is made up of two walls the intine and the exine.
Reason : Both the walls have depositions of sporopollenin.

17. Assertion : Pollen grains of many insect pollinated species are sticky.
Reason : In the anemophilous flower, the pollen grains are powdery and non-sticky.

18. Assertion : Nucellus functions as a nutritive tissue.
Reason : Nucellus is always exhausted completely during development of embryo sac.

(iii) (b) : In coconut (*Cocos nucifera*), the surrounding white kernel called coconut meal is cellular endosperm and the coconut water (also called coconut milk) in the centre is free nuclear endosperm made up of thousands of nuclei.
(iv) (b) : The endosperm of a gymnosperm is haploid (n), while the cells of the root are diploid (2n). So, the number of chromosomes in the root will be 24.
(v) (b)

9. (i) (b) : In double fertilisation, out of the two male gametes one fuses with egg or oosphere to perform generative fertilisation. Generative fertilisation is also called syngamy or true fertilisation. It gives rise to a diploid zygote or oospore.
(ii) (c)
(iii) (b) : During the development of dicot embryo, initially the dicot embryo is globular and undifferentiated. Early embryo with radial symmetry is called proembryo. It is transformed into embryo with the development of radicle, plumule and cotyledons. Two cotyledons differentiate from the sides with a faint plumule in the centre. At this time the embryo becomes heart-shaped.
(iv) (c)
(v) (c) : In the grass family, the cotyledon is called scutellum that is situated towards one side (lateral) of the embryonal axis.

10. (i) (b)
(ii) (a) : The given figure is of circinotropous ovule where funiculus coiled around the ovule. It is found in the Family Cactaceae.
(iii) (d) : Given figure represents an anatropous ovule where A, B, C and D represent micropyle, nucellus, embryo sac and chalaza respectively.
(iv) (b) : Depending upon the configuration and orientation of the body of ovule in relation to funiculus, there are six types of ovule – orthotropous (atropous, erect), anatropous (inverted), hemitropous (half inverted), campylotropous (body curved), amphitropous (both body and embryo sac curved) and circinotropous (funiculus coiled around the ovule).
Anatropous or inverted ovule is the most common type of ovule found in angiosperms (in 80% of angiosperm families). Here, body of the ovule gets inverted and micropyle is on lower side. Further micropyle and funiculus lie side by side and micropyle is close to hilum.
(v) (b)

11. (d): Perisperm is unused nucellus in the seed. It is often non functional for seed. Pericarp is the covering of fruit that develops from ovary wall. It is protective covering and also helps in dispersal and nutrition.
12. (b): The Ubisch bodies are produced only by the glandular tapetum. Ubisch bodies get covered with sporopollenin and thus increase thickening of exine. The Ubisch bodies are involved in the external thickening of the exine, whose pattern is laid down by the spore cytoplasm in the tetrad stage.

13. (b)

14. (a) : The sporogenous cells of anther may directly function as microspore mother cells (also called pollen mother cells or PMCs) or they may undergo a few mitosis to add up to their number before entering meiosis. Each PMC, by a meiotic division, gives rise to a group of four haploid microspores. The aggregates of four microspores are referred to as microspore tetrads.

15. (b): Mostly all the four spores within a tetrad are completely isolated from one another and from the spores in other tetrads of the locule. Usually the microspores separate from one another shortly after meiosis. However, in some plants the spores tend to remain together in tetrads for longer period and develop into compound pollen grains. In many members of Orchidaceae and Asclepiadaceae all the microspores in a sporangium remains together to form what is called a pollinium.

16 (c) : The pollen wall comprises two principal layers, the inner one is called intine and the outer exine. The intine is pecto-cellulosic in nature as is the primary wall of the somatic cells. The exine is composed chiefly of a class of material called sporopollenin.

17. (b)

18. (c) : The body of the ovule consists of a mass of parenchymatous cells named nucellus. The nucellus is mostly consumed by the developing embryo sac or endosperm. But in some plants it persists in the mature seed as a nutritive tissue. The persistent nucellus is called perisperm.

19. (b): Placenta is a ridge of tissue in the inner wall of the ovary bearing one or more ovules and the manner of distribution of the placenta within the ovary is called placentation.

20. (c) : One hypodermal nucellar cell of the micropylar region differentiates into sporogenous cell. It forms a diploid megaspore mother cell or megasporocyte. The megaspore mother cells undergo meiosis and forms a row of four haploid megaspores. Only the chalazal megaspore remains functional while the other three degenerate. The functional megaspore enlarges and gives rise to female gametophyte, also called embryo sac.

21. (b)

22. (b): The majority of angiosperms bear chasmogamous flowers, which means the flowers expose their mature anthers and stigma to the pollinating agents. There is another group of plants which set seeds without exposing their sex organs. Such flowers are called cleistogamous and the phenomenon is cleistogamy. Such flowers show self pollination.

23. (c) : In plants such as hemp and willow where the flowers are unisexual cross pollination becomes obligatory. However, in plants with bisexual flowers legitimate self-pollination is prevented through the various adaptations, such as self- sterility, dichogamy, herkogamy and heterostyly. All those plants in which pollen from a flower is incapable of bringing about fertilization in the same flower are said to be self sterile or self-incompatible.

24. (b): Cross pollination is the transfer of pollen grains from the anther of one flower to the stigma of another flower, *i.e.*, allogamy. Cross pollination is further classified depending on whether the pollination has occurred between two flowers on the same plant (geitonogamy) or between two flowers on different plants (xenogamy). Cross pollination (allogamy) is performed with the help of an external agency. The latter may be abiotic (*e.g.,* wind, water) or biotic (*e.g.,* insects, birds, bats, snails).

25. (b): Of the various insects, bees are the main flower visitors. Bees handle up to 80% of all pollination done by insects. All the bee pollinated flowers are brightly coloured, possess sweet fragrance, and / or produce nectar. Bees are colour blind for red and are fond of yellow, violet and purple. The bees visit flowers to collect their food (pollen and nectar) and in the process prove instrumental in bringing about pollination.

26. (a) : For its pollination the orchid *Ophrys speculum* has picked on the most selective attraction in the entire animal kingdom. It is pollinated by a hairy wasp, *Colpa aurea*. The wasp has a fixed habit whereby its males leave the burrows for above - ground existence about four weeks before the females emerge for the open air mating. The orchid opens its flowers about the same time the males appear and they possess an appearance and odour similar to those possessed by the female wasp. The inexperienced males mistake the *Ophrys* flowers for their female counterparts and land to perform the act of pseudo-copulation. The insect repeats the act with a number of orchid flowers and carries pollinia from one flower to another.

27. (c) : Self-sterility is the condition in which the pollen of a flower has no fertilizing effect on the stigma of the same flower. Cross-pollination is thus the only method in them for the production of seeds. In many bisexual flowers the anther and stigma often mature at different times. This condition is known as dichogamy. Dichogamy often stands as a barrier to self pollination. There are two conditions of dichogamy. (i) protogyny when the gynoecium matures earlier than the anthers of the same flowers (ii) protandry - when the anthers mature earlier than the stigma of the same flower. In both cases only cross pollination is possible.

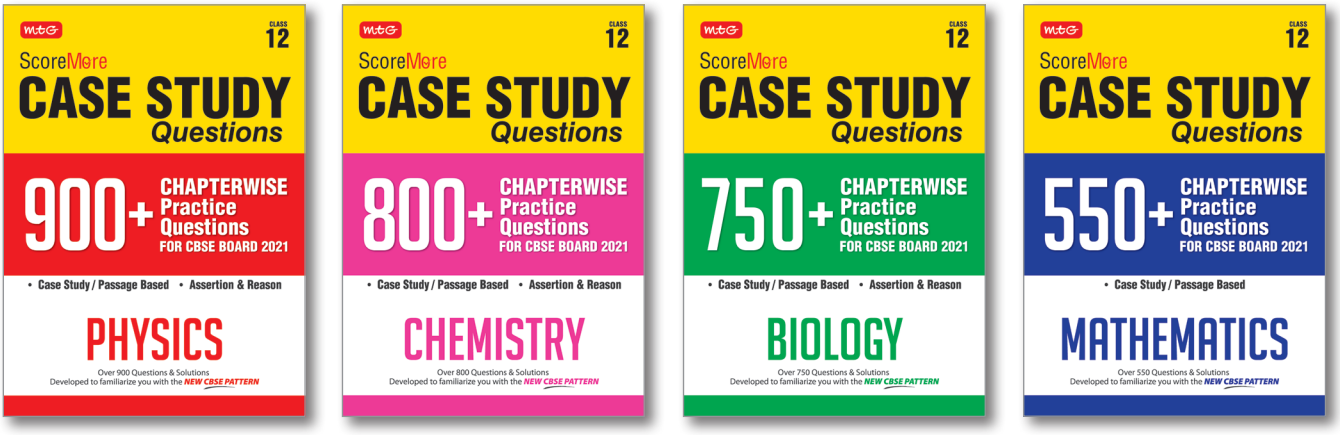
28. (c) : S.G. Nawaschin (1898) was the first to show that both the sperms released by a pollen tube are involved in fertilization. They fertilize two different elements of the embryo sac. The phenomenon is unique to angiosperms and is called double fertilization. The nucleus of one of the sperms fuses with the egg nucleus (syngamy) and that of the other migrates to the central cell where it fuses with two polar nuclei or their fusion product, the secondary nucleus. The second fertilization involves the fusion of three nuclei (sperm with two polar nuclei). This phenomenon is called triple fusion.

29. (b): Fusion of the egg nucleus with sperm nucleus is called syngamy. As, in this process fusion product is diploid zygote or oospore, it is called generative fertilization. It is also called first fertilization as the first sperm fuses with the egg. The second male gamete fuses with the diploid secondary nucleus of the central cell to form a triploid primary endosperm cell. It is known as vegetative fertilization.

30. (b): Helobial endosperm is restricted largely to the monocotyledons. The primary endosperm nucleus moves to the chalazal end of the embryo sac where it divides forming a large micropylar chamber and a small chalazal chamber.

☺☺☺

Get these QUESTIONS *in* CHAPTERWISE *format in*



BUY NOW