

QB365

Important Question - Sexual Reproduction in Flowering Plants

12th Standard CBSE

Biology

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

**Section - A**

- 1) Egg apparatus consists of 1  
(a) egg (b) egg and polar nuclei (c) Egg and synergids (d) Egg and antipodal cells
- 2) In angiosperms, pollen tubes liberate their male gametes into the 1  
(a) Central cell (b) Antipodal cell (c) Egg cell (d) Synergids
- 3) An ovule which becomes curved so that the nucellus and embryo sac lie at right angles to the funicle is 1  
(a) Campylotropous (b) Anatropous (c) Orthotropous (d) Hemitropous
- 4) The pollen tube usually enters the embryo sac 1  
(a) Through one of the synergids (b) By directly penetrating the egg  
(c) Between one synergid and central cell (d) By knocking off the antipodal cells
- 5) Milky water of tender coconut is 1  
(a) Liquid gametes (b) liquid nucellus (c) Liquid female gametophyte (d) Liquid embryo  
(e) Liquid endosperm
- 6) Chiropterophily means... 1  
(a) Pollination by insects (b) Pollination by the wind (c) Pollination by bats (d) Pollination by snails
- 7) In some plants anthers and stigma grow and mature at the same time. This phenomenon is called 1  
(a) Homogamy (b) Sanamy (c) Allogamy (d) Fusion
- 8) Which one of the following is surrounded by a callose wall? 1  
(a) Male gamete (b) Egg (c) Pollen grain (d) Microspore mother cell
- 9) Male gametes in angiosperms are formed by the division of 1  
(a) Generative cell (b) vegetative cell (c) Microspore mother cell (d) Microspore
- 10) Duple fertilization is the process in plants that includes 1  
(a) Syngamy and triple fusion (b) only triple fusion (c) Development of antipodal cells  
(d) Name of the above

**Section - B**

- 11) You must have seen corn cobs with tassels. What do these tassels represent? What is their significance/advantage? 2
- 12) Name two plants each, that have 2  
(i) one ovule in the ovary and  
(ii) more than one ovule in the ovary.

- 13) What is filiform apparatus? What is its function? 2
- 14) Name any four biotic agents of pollination. 2
- 15) Even though each pollen grain has two male gametes, why are at least 10 pollen grains and not 5 pollen grains required to fertilise 10 ovules present in a particular carpel? 2
- 16) Name two plants each with (i) fleshy pericarp and (ii) dry pericarp. 2
- 17) Name the oldest seed that has germinated. Where was it found? 2
- 18) Why do some plants have both chasmogamous and cleistogamous flowers? 2
- 19) Some plants have a mechanism of shedding of pollen before maturation of stigma. Why? 2
- 20) (a) Explain triple fusion in angiosperms. 2
- (b) Write the fate of the product of this fusion in the mature fruit of coconut.

### Section - C

- 21) Explain the process of artificial hybridisation to get improved crop variety in 5
- (i) plants bearing bisexual flowers and
- (ii) female parent producing unisexual flowers.
- 22) How does a pollen mother cell develop into a mature pollen grain? Illustrate the stages with labelled diagrams. 5
- 23) (a) Draw a diagrammatic sectional view of a mature anatropous ovule and label the following parts in it. 5
- (i) that develops into seed coat.
- (ii) that develops into embryo after fertilisation.
- (iii) that develop into endosperm in an albuminous seed.
- (iv) through which the pollen tube gains entry into the embryo sac.
- (v) that attaches the ovule to placenta.
- (b) Describe the characteristic features of wind-pollinated flowers.
- 24) (a) Draw a diagram of a mature embryo sac of an angiosperm and label the following parts in it: 5
- (i) Filiform apparatus
- (ii) Synergids
- (iii) Central cell
- (iv) Egg cell
- (v) Polar nuclei
- (vi) Antipodals
- (b) Write the fate of egg cell and polar nuclei after fertilisation.

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### Section - A

- 1) (c) Egg and synergids 1
- 2) (d) Synergids 1
- 3) (d) Hemitropous 1
- 4) (a) Through one of the synergids 1

- 5) (d) Liquid embryo 1
- 6) (c) Pollination by bats 1
- 7) (b) Sanamy 1
- 8) (d) Microspore mother cell 1
- 9) (a) Generative cell 1
- 10) (a) Syngamy and triple fusion 1

### Section - B

- 11) The tassels of corn cob are the styles and stigma. 2  
They are meant to easily trap the air-borne pollen grains.
- 12) (i) Mango, Wheat, Maize 2  
(ii) Papaya, Orchids, Watermelon
- 13) The specialised cellular thickenings of the synergids at the micropylar tips, are called filiform apparatus. 2  
- They guide the pollen tube into the synergid and to liberate the gametes.
- 14) Biotic agents of pollination: 2  
(i) Insects like butterflies, bees, wasps, etc.  
(ii) Birds like humming bird.  
(iii) Bats  
(iv) Lemurs  
(v) Arboreal rodents.
- 15) 2  
The two male gametes produced by a pollen grain are used in the fertilisation of one ovule.  
One male gamete fuses with the female gamete to form the zygote, i.e. syngamy.  
The second male gametes fuses with the secondary nucleus, to form the triploid primary endosperm nucleus (PEN), i.e. triple fusion.  
As double fertilisation (two fusions) occurs in the ovules of angiosperms, ten pollen grains are necessary to fertilise ten ovules.
- 16) (i) Guava, tomato, mango. 2  
(ii) Groundnut, mustard, bean.
- 17) 2  
Lupinus arcticus germinated and flowered after about 10,000 years of dormancy. This happened in Arctic tundra.
- 18) 2  
Viola (common pansy) and Commelina can produce both chasmogamous and cleistogamous flowers on the plant. These flowers produce seeds by out-crossing and selfing respectively and the mixed breeding system is considered a successful reproductive strategy.
- 19) 2  
The strategy of shedding of pollen before maturation of stigma is to prevent self-fertilisation and reduce inbreeding depression. Such mechanisms facilitate cross-pollination and produce genetically better yielding crops.

20)

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- (a) - In the mature embryo sac of an angiosperm, two polar nuclei in the central cell fuse to form a diploid secondary nucleus.
- During fertilisation, one of the male gametes fuses with the secondary nucleus to form a triploid primary endosperm nucleus (PEN); the central cell is now called primary endosperm cell (PEC).
- Since, three nuclei triple fusion.
- (b) - The primary endosperm nucleus of the primary endosperm cell undergoes repeated mitotic divisions, to give rise to a number of free nuclei; at this stage, the endosperm is called free nuclear endosperm.
- subsequently, cell wall formation starts from the periphery and the endosperm becomes cellular.
- The water in the tender coconut represents the nuclear endosperm, while the white kernel represents the cellular endosperm.

### Section - C

21)

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- Emasculation refers to the practice of removal of anthers/stamens from a bisexual flower before the pollen grains mature.
  - It is necessary to prevent the self-pollen from contaminating the stigma.
  - Bagging refers to the covering of the emasculated flowers with a suitable bag made of butter paper; it is essential to prevent contamination of the stigma of the emasculated flower with unwanted pollen grains.
  - When the stigma becomes receptive, the pollen grains from the selected flowers are dusted on it and the flower is rebagged for the development of fruits and seeds.
- If female parent bears unisexual flowers, there is no need for emasculation.
- The female flower buds are bagged before they open.
  - When the stigma becomes receptive, pollination is carried out with the desired pollen the flowers are rebagged.

22)

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(a) Development of Pollen grain:

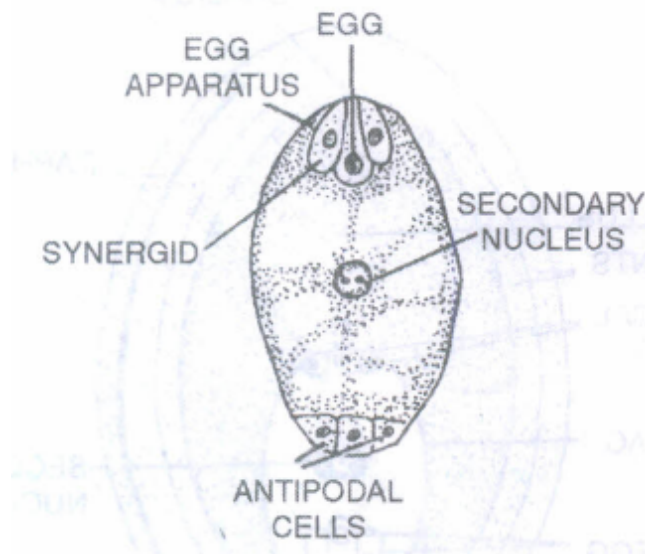
- Microsporocytes undergo mitotic divisions to increase the number of functional microspore mother cells.
- Each microspore mother cell undergoes meiosis to form a microspore tetrad.
- All the four microspores remain enclosed in a common wall.
- They start separating from each other.
- The nucleus undergoes a mitotic division resulting in the formation of a large vegetative cell and a small generative cell.
- The spore develops a wall of two layers the outer- exine and inner intine.
- At this stage, the pollen grains are liberated; but in some cereals the generative cell undergoes mitosis and the pollen grain is 3-celled, at the time of liberation.

(b) Mature Pollen Grain:

- A mature pollen grain has a protective covering of two layers.
- The outer is thick, sculptured variously and is made of sporopollenin; this layer is called exine.
- The inner layer, called intine is thin and is made of cellulose.
- A mature pollen grain is two celled with a large vegetative cell and a small generative cell floating in the cytoplasm of the vegetative cell.
- The pollen grains of dicot plants have three germ pores while those of monocots have one.

23)

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- part that develops into seed coat integuments
- part that develops into an embryo after fertilization-egg
- that develops into endosperm in a albuminous seed-polar nuclei
- through which pollen tube enters into embryo sac-micropyle
- that attaches the ovule to the placenta funiculus.

24)

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(b) - The egg cell on fertilisation becomes the zygote, which later forms the embryo

- The polar nuclei fuse to form a diploid secondary nucleus; on fertilisation by a male gamete, it forms the primary endosperm nucleus, which later forms the endosperm.