

# DPP

DAILY PRACTICE PROBLEMS

Class : XII<sup>th</sup>  
Date :

## Solutions

Subject : BIOLOGY  
DPP No. : 4

### Topic :- Sexual Reproduction in Flowering Plants

- 1 **(c)**  
Endosperm =  $3n = 5 \times 3 = 15$  chromosome  
Egg cell =  $1n = 1 \times 5 = 5$  chromosome  
Polar cell =  $2n = 2 \times 5 = 10$  chromosome
- 2 **(c)**  
(i) Antipodal cell – Haploid  
(ii) Egg cell – Haploid  
(iii) Synergid cell – Haploid  
(iv) Polar nuclei – Diploid  
(v) Male gamete – Haploid  
(vi) Nuceller cell – diploid  
(vii) Chalazal cell - diploid
- 3 **(d)**  
*Crotalaria* is a member of Papilionaceae (Fabaceae), in which 10 stamens are present in a flower. Each stamen has four microsporangia, in which microspore mother cells are found. Each microspore mother cell gives rise to a pollen tetrad.  
Thus, 10 flowers (with 10 stamens in each) having 30 microsporangia in each microsporangium will form **48,000** pollen grains.
- 4 **(b)**  
In *citrus*, apomictic embryos arise from maternal sporophytic tissue in ovule.
- 5 **(a)**  
True Plants, in which the water or air pollination is prevalent, produces large number of pollens because of wastage of pollen during pollination by abiotic means
- 6 **(a)**  
Absence of integuments.  
Micropyle is found in both seed and ovule. In seed it is the pore through which water goes inside during germination. In ovule the absence of

- integuments form micropyle
- 7 **(d)**  
An ideal embryo sac contains 7-cells and 8-nuclei. 3-cells are present at the micropylar end and form **egg apparatus**, mid of which egg cell and rest two lateral form synergids. One cell present in the centre of embryo sac, known as central cell and contains two nuclei and rest three cells are present at chalazal end for **antipodal cells**.
- 8 **(d)**  
**Synergid cells** are characterized by the presence of finger like projections called filiform apparatus attached to their upper wall at micropylar end. This filiform apparatus is known to attract and guide the pollen tube.
- 9 **(a)**  
Aleurone layer prepare amylase (an enzyme), which acts on the starch and frees the glucose unit for developing embryo
- 10 **(d)**  
Pollination by bats is called **cheiropterophily**.
- 11 **(a)**  
**Cleistogamy** is the condition when flowers remain closed and self-pollination is the rule. *Commelina benghalensis* produces underground cleistogamous and aerial chasmogamous flowers. Cleistogamy is also seen in *Impatiens*, *Viola*, *Subularia*, etc.
- 12 **(b)**  
**Pollen Grain** when pollen grain matures *it contains two cells*  
(i) **Vegetative cell** Vegetative cell is bigger and has abundant food reserve and a large irregular shaped nucleus  
(ii) **Generative cell** The generative cell is small and floats in the cytoplasm of vegetative cell. It is spindle-shaped with dense cytoplasm and a nucleus
- 13 **(a)**  
**Artificial Hybridisation** In such crossing experiments where it is important to make sure that only the desired pollen grains are used for pollination and stigma is protecting from contamination (from unwanted pollen), this

technique is used.

### Steps in Artificial Hybridisation

(i) **Emasculation** Removal of anthers from the flower bud before the anther dehiscence using forceps. This step referred to as emasculation

(ii) **Bagging** Emasculated flowers have to be covered with a bag of suitable size, generally made up of butter paper to prevent contamination of its stigma with unwanted pollen. This process is called bagging.

(iii) **Rebagging** When the stigma of bagged flower attains receptivity, mature pollen grains collected from the anthers of the male parent are dusted on the stigma and the flowers are rebagged, and the fruits allowed to developed

14 (a)

**Homogamy** is the condition, in which male and female parts of a flower mature simultaneously.

15 (d)

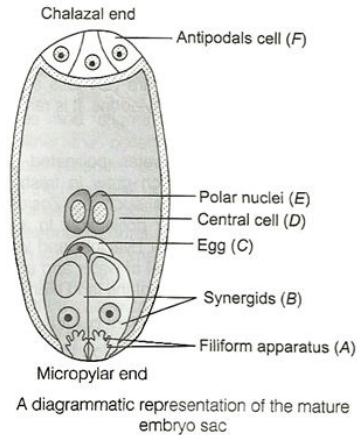
The double fertilization was discovered by **S G Nawaschin** (1898) and **Guignard** in *Lilium* and *Fritilaria*. Double fertilization is restricted only to angiosperms. When pollen tube enters ovule, it strikes one of the synergids and burst open to release the two male gametes, which fuse with two different structures in the same female gametophyte. Thus, **double fertilization** can be distinguished as :

**1. Generative Fertilization:** Fusion of one male gamete with the egg producing diploid zygote or oospore.

**2. Vegetative Fertilization:** Fusion of nucleus of second male gamete with the diploid secondary (fused) nucleus or the triple fusion, *i.e.*, fusion of one male polar nuclei forming endosperm ( $3n$ ).

16 (a)

Six out of the eight nuclei are surrounded by cell walls and organized into cells (egg cells and antipodal cells) and remaining two nuclei called polar nuclei are situated below the egg apparatus in large central cell. Thus, a typical angiospermic embryo sac at maturity is 8-nucleate and 7-celled. Mature embryo sac



- 17 **(c)**  
An ovule is an integumented megasporangium found in spermatophytes, which develops into seed after fertilization. An angiospermic ovule is typically an ovoid and whitish structure. It occurs inside the ovary, where it is attached to a parenchymatous tissue called placenta either singly or in a cluster
- 18 **(b)**  
During the development of nuclear endosperm, the primary endosperm nucleus divides repeatedly without wall formation, *i.e.*, produce large number of free nuclei. The multinucleate cytoplasm undergoes cleavage and gives rise to multicellular tissue, *e.g.*, maize, wheat, rice, sunflower, etc.
- 19 **(b)**  
*Polygonum* type of embryo sac is the most common in angiosperms. It is 7-celled and 8-nucleate. The nuclei are arranged in such a way that three organized at micropylar end and form egg apparatus (one egg and two synergids), two nuclei migrate to centre and form polar nuclei in a single central cell and three nuclei at chalazal pole organized into antipodal cells.
- 20 **(d)**  
Flowering plants have developed many devices to discourage self-pollination. In some species, pollen, releases and stigma receptibility is non-synchronised, *i.e.*, either the pollen is released before the stigma becomes receptive or stigma becomes receptive much before the release of

pollen.

In some other species the anther and stigma are placed at the different positions so that the pollen can not come in contact with the stigma of same flower. Both these devices prevent autogamy.

The third device to prevent inbreeding is self-incompatibility. This is genetic a mechanism and prevents self pollination (from same flower or other flower of same plant) from fertilizing the ovules by inhibiting pollen germination or pollen tube growth in pistil

<b>ANSWER-KEY</b>										
<b>Q.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>A.</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>D</b>	<b>D</b>	<b>A</b>	<b>D</b>
<b>Q.</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>A.</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>D</b>	<b>A</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>D</b>

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