Solution

CET25B1 SEXUAL REPRODUCTION IN FLOWERING PLANTS

Class 12 - Biology

1.

(d) Germ pore
Explanation: Germ pore

2.

(c) Synergid, zygote, and primary endosperm nucleus
Explanation: During fertilization, egg fuses with male gamete to form a diploid zygote and two male polar nuclei fuse with another male gamete to form a triploid primary endosperm nucleus. Synergids and antipodals remain haploid and degenerate later.

3.

(b) Produce pure line
Explanation: Self-pollination involves the transfer of pollen grain from the anther to the stigma of the same flower. The two fusing gametes are genetically similar to each other as they are produced by the same plant. Continued self – pollination results in pure line and breeding depression.

4. **(a)** Pistil
Explanation: Pistil or carpel is located at the center followed by stamen, carpel, and sepals. Pistil contains stigma, style, and ovary.

5. **(a)** Generative cell
Explanation: Generative cell

6.

(d) 57
Explanation: 57

7.

(b) Syngamy + triple fusion
Explanation: Syngamy + triple fusion

8. **(a)** Sometimes monosporic, sometimes bisporic and sometimes tetrasporic.
Explanation: Sometimes monosporic, sometimes bisporic and sometimes tetrasporic.

9.

(c) Hypodermally in the micropylar region
Explanation: In ovule female gamete is formed at micropylar end and three antipodal cells at chalazal end. The two central nuclei are called polar bodies that fuse with one of the male gametes to form endosperm.

10.

(c) 16
Explanation: Each microspore mother cell produces four pollen grains by reduction division. Hence to produce 64 pollen grains 16 meiotic or reduction division is required.

11.

(b) Alternation of generation
Explanation: Alternation of generation is the cyclic change in organisms involving haploid and diploid stages. Meiotic division results in the haploid stage and the fusion of haploid gametes results in the diploid stage.

12.

(d) Geitonogamy
Explanation: Geitonogamy

13.

(d) Geitonogamy
Explanation: Geitonogamy

14.

(c) Cleistogamous

Explanation: Some flowers do not open at all. Self-pollination is the only means of pollination in these flowers. These flowers are called Cleistogamous flower. The other flowers that open for pollination are called Chasmogomous flowers.

15.

(c) Homogamy

Explanation: Homogamy – In this case, the anther and stigmas of a bisexual flower mature simultaneously. The pollen grains reach the mature stigma either by contact, wind, gravity, raindrop, or even insects. Self-pollination brought about by contact is called direct autogamy and remaining agencies perform indirect autogamy.

16. **(a)** Provide nourishment to the young microspore mother cell

Explanation: Tapetum is the cells surrounding the microspore mother cells. These cells provide nourishment to the young microspore mother cells.

17.

(c) Sexual reproduction

Explanation: Sexual reproduction

18.

(d) Emasculation

Explanation: Emasculation is a process in which we remove stamens from a bisexual flower to prevent self-pollination. In dioecious plants, we do not need to perform emasculation as stamens are not present with pistils.

19.

(d) Guiding the entry of pollen tube

Explanation: The filiform apparatus is a finger-like projection attached to the egg apparatus. This apparatus guide the pollen tube carrying male gametes for facilitating Syngamy.

20.

(b) Both male and female reproductive parts

Explanation: Monoecious flowers contain both male and female reproductive parts that are androecium and gynoecium. Androecium produces male gametes and gynoecium produces female gametes.

21.

(d) Epidermis and tapetum

Explanation: A microsporangium is surrounded by four wall layers - the epidermis, endothecium, middle layers, and tapetum. The innermost layer is tapetum and the outermost layer is the epidermis.

22. **(a)** Euphorbiaceae

Explanation: Euphorbiaceae

23.

(b) Sexual reproduction

Explanation: Sexual reproduction in flowering plants centres around the flower. Within a flower, there are usually structures that produce both male gametes and female gametes.

24.

(c) Autogamy

Explanation: Autogamy

25.

(c) Microspore mother cells

Explanation: During microsporogenesis, Microspore mother cells undergo meiosis to form microspore tetrad which later differentiate in pollen grains.

26. **(a)** Amphitropous ovule

Explanation: Amphitropous ovule

27.

(b) Cotyledons and scutellum

Explanation: The early stages of embryo development are similar in dicots and monocots. Dicots have two cotyledons while monocots(grasses) have one cotyledon which is known as scutellum.

28.

(b) Cleistogamy
Explanation: Cleistogamy

29.

(b) Embryoids
Explanation: Embryoids

30. **(a)** Chiropterophily
Explanation: Chiropterophily

31.

(b) Liquid nitrogen
Explanation: Pollen grain consists of hard covering of exine but their viability may be lost with time. For Hybridization, pollen grains are collected and stored in liquid nitrogen below -196^{0}Celsius temperature.

32.

(b) Embryo sac
Explanation: Embryo sac

33.

(b) Bat
Explanation: Bat is nocturnal mammals that also transfer pollen grain from anther to the stigma of another flower. Bat transfer pollen grain over a very long distance in comparison to other animals.

34.

(b) 400
Explanation: Each microspore mother produces 4 pollen grains by reduction division. Bilobed dioecious have four microsporangia. 50 microspore mother cells will produce 50x4=200 pollen grains and 200 pollen grains will give raise to 200x2=400 male gametes

35.

(c) Haploid
Explanation: Haploid

36. **(a)** Tapetum
Explanation: Microsporangium is covered by a number of layers. The outer layer or integuments surround the tapetum. The tapetum provides nutrients to growing microspores that leads to pollen grains.

37.

(d) Endomitosis as well as endopolyploidy
Explanation: Endomitosis as well as endopolyploidy

38.

(d) Nucellus
Explanation: The ovule is surrounded by parenchymatous tissues called nucellus. The nucellus is diploid cells as it does not undergo a reduction division.

39.

(d) Juicy aril
Explanation: Juicy aril

40.

(c) Fusion of 2 polar nuclei and second male gamete only.
Explanation: Fusion of 2 polar nuclei and second male gamete only.

41.

(b) Syncarpous
Explanation: The gynoecium is the female reproductive part of the flower. It consists of a single or more than two carpels (pistil). When these carpels are fused together, they are called syncarpous.

42. **(a)** Two polar nuclei
Explanation: Two polar nuclei

43. **(a)** Tapetum
Explanation: The microsporangium is covered by four-layered walled the outer three layers or integuments are protective in nature. The innermost layer has cells having more than one nucleus, called a tapetum. It provides nutrients to growing megaspores.

44. **(b)** Wind
Explanation: Wind pollinated plants bear light and non-sticky flowers and long and feathery stigma.

45. **(c)** Egg and antipodal cells
Explanation: Egg and antipodal cells are haploid structure as they are formed by meiosis cell divisions in which the number of chromosomes reduce to half. This kind of division occurs only during gamete formation.

46. **(c)** 1 and 2 are correct.
Explanation: 1 and 2 are correct.

47. **(c)** Parthenocarpy
Explanation: Parthenocarpy

48. **(d)** Parthenocarpy
Explanation: When fruits develop without fertilisation, the fruits are called parthenocarpic fruits, and the process is known as parthenocarpy.

49. **(a)** Cleistogamous flower
Explanation: Cleistogamy or automatic self-pollination describes the trait of certain plants to propagate by using non-opening, self-pollinating flowers. Especially well known in peanuts, peas, and beans, this behavior is most widespread in the grass family.

50. **(b)** Papaya
Explanation: The flower which contains either male or female reproductive part is called unisexual flower. Papaya plants produce either male or female flowers in separate plants.

51. **(c)** Perianth
Explanation: In some flowers, there is no distinction between sepals and petals. In these flowers, these non-essential organs are together called as perianth. The individual parts of the perianth are called tepals.

52. **(d)** Anther
Explanation: Pollen grains are formed inside the anther. Stamen contains filament and anther. Inside the anther, the microsporogenesis process takes place to produce haploid pollen grains that form male gametes.

53. **(a)** Calyx, corolla, androecium, and gynoecium
Explanation: In a typical bisexual flower, the arrangement of floral whorls on the thalamus from the outermost to the innermost is always as calyx, corolla, androecium, and gynoecium.

54. **(a)** Better progeny
Explanation: Transfer of pollen grain from the anther of one flower to the stigma of another flower is called cross-pollination. It produces better progeny.

55. **(d)** Dioecious plant bearing only male or female flowers.
Explanation: Autogamy is a fusion of male and female gamete from the same flower and geitonogamy is the fusion of male and female gamete from the same plant but different flowers. Thus if a plant produces only male or female types of flowers then it will prevent both autogamy and geitonogamy.

56. **(a)** Triple fusion
Explanation: Triple fusion

57. **(a)** Lotus
Explanation: Lotus is an aquatic plant and has a bisexual flower. The cross-pollination occurs in Lotus by means of insects i.e. beetles.

58. **(d)** Flower develop in the axils of bracts like axillary shoots
Explanation: The flower is a modified shoot because it develops in the axils of bracts like axillary shoots. New buds also develop at node inside the axils of bracts of leaves.

59. **(b)** Xenogamy
Explanation: Xenogamy

60. **(a)** Stigma, ovule, embryo sac, placenta
Explanation: Each pistil has three parts, the stigma, style, and ovary. The stigma serves as a landing platform for pollen grains. The style is the elongated slender part beneath the stigma. The basal bulged part of the pistil is the ovary. Inside the ovary is the ovarian cavity (locule). The placenta is located inside the ovarian cavity. are The megasporangia arising from the placenta, commonly called ovules.

61. **(a)** Synergids and antipodals
Explanation: After entering one of the synergids, the pollen tube releases the two male gametes into the cytoplasm of the synergid. One of the male gametes moves towards the egg cell and fuses with its nucleus thus completing the syngamy. This results in the formation of a diploid cell, the zygote. The other male gamete moves towards the two polar nuclei located in the central cell and fuses with them to produce a triploid primary endosperm nucleus (PEN). As this involves the fusion of three haploid nuclei it is termed triple fusion. Since two types of fusions, syngamy and triple fusion take place in an embryo sac the phenomenon is termed double fertilization, an event unique to flowering plants. The central cell after triple fusion becomes the primary endosperm cell (PEC) and develops into the endosperm while the zygote develops into an embryo. Synergids and antipodals get degenerate after double fertilization.

62. **(d)** Anemophily
Explanation: Anemophily

63. **(b)** Microsporangium, sporogenous tissue, microspore tetrad, microspore
Explanation: Microspores are male gametes. The formation of microspore takes place inside microsporangium which contains sporogenous tissue. Sporogenous tissue undergoes a reduction division to form tetrad that separates from each other and becomes microspore.

64. **(d)** Insects
Explanation: The transfer of pollen grain from the anther to stigma is called pollination. Pollination is caused by winds, insects, water, and some other means. Insect pollinated flowers are called Entomophilous flowers.

65. **(a)** the flower is cleistogamous.
Explanation: the flower is cleistogamous.

66. **(b)** Megasporogenesis
Explanation: The process of formation of female gametophyte inside the ovary by meiotic and mitotic division is called megasporogenesis.

67. **(a)** seven celled
Explanation: seven celled

68. **(b)** Microspore mother cell
Explanation: Microspore mother cell

69. **(b)** egg, embryo sac, nucellus, integument
Explanation: 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 organized. Cells of the nucellus have abundant reserve food materials. Located in the nucellus is the embryo sac or female gametophyte. Egg is present inside the embryo sac.

70.

(b) Ovule
Explanation: Ovule

71.

(b) they produce both male and female flowers on the same plant.
Explanation: they produce both male and female flowers on the same plant.

72.

(c) 8 nucleate -7 celled
Explanation: 8 nucleate -7 celled

73.

(b) An egg cell and two synergids.
Explanation: An egg cell and two synergids.

74.

(d) Diploid
Explanation: Generally, megaspore mother cell undergoes meiosis to form haploid megaspore which later develops into an embryo sac with haploid nuclei. If megaspore mother cell will not undergo meiosis then nuclei of embryo sac will be diploid.

75.

(d) Exine
Explanation: Exine