UNIT - I

SEXUAL REPRODUCTION IN FLOWERING PLANTS

Group - A

I. Select the correct answer from the choices given under each bit :

1. The end product(s) of sexual reproduction in flowering plants is / are :

(a) gametes (b) spores

(c) zygote (d) sporocarps

2. Which are the two essential whorls of a flower that bear sexual reproductive units ?

(a) calyx and Corolla

(b) corolla and androecium

(c) corolla and gynoecium

(d) androecium and gynoecium

3. The innermost wall layer of a microsporangium is :

(a) endothecium

(b) tapetum

(c) epidermis

(d) endodermis

4. Which one is responsible for the nutrition of developing pollens ?

(a) Tapetum

(b) Endodermis

(c) Epidermis

(d) Columella

5. Which one is the last cell of male sporophytic generation ?

(a) Megaspore mother cell

(b) Megaspore

(c) Microspore mother cell

(d) Microspore

6. Which one is not the characteristic feature of sporopollenin ?

(a) dominant component of pollen wall.

(b) can be easily degraded by enzymes

(c) can not be degraded by enzymes

(d) helps pollen grains to be preserved as fossils

7. Which one is different from other three ?

(a) microspore (b) pollen grain

(c) sperm (d) anther

8. Which is not the characteristic of vegetative cell of the pollen grains ?

(a) Spindle shaped

(b) Abundant reserve food materials

(c) Large irregular shaped nucleus

(d) Bigger than the generative cell

9. The part of the carpel that receives pollen grains is called :

(a) Ovary (b) Ovule

(c) Stigma (d) Style

10. Which are also called ovules ?

(a) Microsporangia

(b) Megasporangia

(c) Nucellus

(d) Anthers

11. Which of the following possess one seeded ovules ?

(a) Wheat, Rice, Mango

(b) Wheat, Rice, Papaya

(c) Wheat, Mango, Orchids

(d) Rice, Mango, Watermelon

12. Which is the correct sequence ?

(a) Thalamus, ovary, stigma and style

(b) Thalamus, ovary, style and stigma

(c) Stigma, ovary, thalamus and style

(d) Style, ovary, thalamus and stigma

13. Which one is the female gametophyte of angiosperms ?

(a) Nucellus (b) Ovary

(c) Ovule (d) Embryo sac

14. Synergids one part of :

(a) Antipodals

(b) Central Cell

(c) Egg apparatus

(d) Polar nuclei

15. Filiform apparatus are prolongation of :

(a) Antipodal cells

(b) Synergids

(c) Polar nuclei

(d) Egg cell

16. A typical embryo sac in angiosperms is 8 nucleate and :

(a) 8 Celled (b) 7 Celled

(c) 6 Celled (d) 4 Celled

17. Which pair shows autogamous pollination ?

(a) Cleistogamous & geitonogamous

(b) Cleistogamous & chasmogamous

(c) Cleistogamous & Xenogamous

(d) Chasmogamous & Xenogamous

18. Which is not a characteristic of Cleistogamous flower ?

(a) never open.

(b) anther and stigma on separate flowers.

(c) anthers and stigma in close contact.

(d) borne in same flower.

19. Indicate the characteristics of wind pollinated flowers ?

(a) Large, coloured, fragrant and have nectar.

(b) Small coloured flowers with light pollen grains carried in water.

(c) Small flowers, light and non-sticky pollen grains produced in large numbers.

(d) Large, Coloured, nectary, pollen grains sticky.

20. Which part of the flower provides nutrition to the insects in the process of pollination ?

(a) Nectar (b) Colour

(c) Scent (d) Size

21. Which is not an outbreeding device ?

(a) Pollen release and stigma receptivity not synchronised.

(b) Anther and stigma placed at different positions.

(c) Bisexual flowers and reproductive organs mature simultaneously.

(d) Flowers are unisexual.

22. Geitonogamy occurs in :

(a) Maize

(b) Oxalis

(c) Viola

(d) Commelina

23. When in a bisxual flower, pollen matures first and ovary matures later, it is called :

(a) Protogyny

(b) Protandry

(c) Unisexuality

(d) Heteromorphism

24. Which one does divide to form male gamete ?

(a) Tube cell

(b) Antipodal cell

(c) Generative cell

(d) Vegetative cell

25. Which part of the embryo sac does contain filiform apparatus ?

(a) Egg cells (b) Antipodal cell

(c) Central cell (d) Synergids

26. Which one can not be included under Pollen-Pistil interaction?

(a) Pollen recognition

(b) Pollen tube growth

(c) Pollen maturation

(d) Pollen inhibition

27. The process of removal of anthers from flower bud before anther dehisces in order to initiate hybridization is called :

(a) emasculation

(b) pollination

(c) geitonogamy

(d) bagging

28. In triple fusion, male gamete fuses with:

(a) Synergids

(b) Central Cell

(c) Antipodals

(d) Egg Cell

29. Which process does result in Zygote?

(a) Syngamy

(b) Triple fusion

(c) Pollen rejection

(d) Pollen incompatibility

30. Which one is a triploid structure ?

(a) egg cell

(b) embryo

(c) zygote

(d) primary endosperm nucleus

31. Which is unrelated pair ?

(a) Syngamy-Zygote

(b) Zygote-Embryo

(c) Primary endosperm nucleus-zygote

(d) Primary endosperm nucleus-endosperm

32. Which one is example of free nuclear endosperm ?

(a) Coconut Kernel

(b) Coconut water

(c) Rice grain

(d) Bean seeds

33. One of the following has no persistent seed coat.

(a) Rice (b) Wheat

(c) Maize (d) Groundnut

34. Which is unrelated pair ?

(a) Stamen - Pollens

(b) Carpel - Ovule

(c) Embryo sac - Egg cell

(d) Pollen grain - Megasporangium

35. Which is unrelated pair ?

(a) Calyx - Tepals

(b) Corolla - Petals

(c) Androecium - Stamens

(d) Gynoecium - Carpels

36. Which is the correct sequence in the formation of nuclear endosperm?

(a) Primary endosperm nucleus → Vacuolation → Free nuclear division → Cell organisation

(b) Cell organization → Primary endosperm nulceus → Vacuolation → Free nuclear division

(c) Primary endosperm nucleus → Free nuclear division → Vacuolation → Cell organisation

(d) Primary endosperm nucleus → Cell organisation → Vacuolation → Free nuclear division

37. Embryo develops from :

(a) Ovule

(b) Zygote

(c) Primary endosperm

(d) Ovary

38. Embryo consists of embryonal axis and :

(a) epicotyl (b) hypocotyl

(c) cotyledons (d) plume

39. Plumule can be called :

(a) roof tip (b) stem tip

(c) radicle (d) cotyledons

40. What is present as cotyledon of grass family ?

(a) scutellum

(b) embryonal axis

(c) hypocotyl

(d) epicotyl

41. Coleorhiza is the covering of :

(a) radicle and roof cap

(b) shoot apex and leaf primordia

(c) radicle and root hairs

(d) radicle and shoot apex

42. Coleoptile is the covering of :

(a) radicle and rof cap

(b) shoot apex and leaf primodia

(c) shoot apex and internodes

(d) shoot apex and nodes

43. Fertilized ovule is :

(a) fruit (b) endosperm

(c) embryo (d) seed

44. Which pair is incorrect ?

(a) Non-albuminous seeds - No endosperm

(b) Albuminous seeds - Endospermous

(c) Non-albuminous seeds - Endospermous

(d) Persistent nucellus - perisperm

45. Which pair is unrelated ?

(a) Pea - Nonalbuminous

(b) Maize - Albuminous

(c) Castor - Albuminous

(d) Ground nut - Albuminous

46. Which one has non-albuminous seeds?

(a) Barley (b) Wheat

(c) Beans (d) Rice

47. What are the requirements for a seed to germinate ?

(a) Moisture, Oxygen & Temperature

(b) Moisture & Oxygen

(c) Moisture & Temperature

(d) Moisture, Water and Light

48. Matured ovary is a :

(a) Seed (b) Fruit

(c) Gamete (d) Zygote

49. True fruits develop from :

(a) thalamus (b) integlements

(c) nucellus (d) ovary

50. Which is not a correct statement about seeds?

(a) have better adaptive startegies for dispersal to new habitats.

(b) have sufficient food reserves for young seedlings.

(c) Produce no new genetic combination which may lead to variation.

(d) Provides nourishment till photosynthesis starts in new plant.

51. Seeds formed without fertilization is called :

(a) Panthenocarpy

(b) Apomixis

(c) Syngamy

(d) Triple fusion

52. Which is not an apomictic process ?

(a) Seeds formed by sexual reproduction.

(b) Egg diploid but no sexual reproduction.

(c) Nucellar tissue produce embryo, no sexual reproduction.

(d) Seeds develop but no sexual reproduction.

53. Anemophilous flowers are pollinated by :

(a) Wind (b) Water

(c) Animals (d) Man

54. Male gametes are formed from :

(a) tube cell

(b) generative cell

(c) stalk cell

(d) primordial cell

55. Which cell of embryo sac does form zygote ?

(a) Synergid

(b) Antipodals

(c) Central Cell

(d) Egg Cell

56. Which one does not represent a haploid stage ?

(a) Microspore

(b) Male gamete

(c) Microsporangium

(d) Pollen

57. Which is a diploid stage ?

(a) Megasporangium

(b) Megaspore

(c) Embryo sac

(d) Female gametophyte

58. What are archesporium or archesporial cells?

(a) Endothelium

(b) Epidemis

(c) Tapetum

(d) Middle layers

59. What is the main component of outer layer (exine) of microspore wall?

(a) Cellulose

(b) Chitin

(c) Lipoprotein

(d) Sporopollenin

60. Which layer of the microsporangial wall does help in dehiscence of spores ?

(a) Endothecium (b) Tapetum

(c) Epidermis (d) Hypodermis

61. How many nuclei form male gametophyte of angiosperms at the time of fertilization ?

(a) 1 (b) 2

(c) 3 (d) 4

62. Which is not a part of the carpels ?

(a) Ovary (b) Style

(c) Stigma (d) Anther

63. Which type of Ovules are called anatropous?

(a) Upright

(b) Inverted

(c) Horse-shoe shaped

(d) Horizontal

64. Egg apparatus consists of :

(a) Egg Cell + Synergids

(b) Antipodals + Synergids

(c) Antipodals + Egg Cell

(d) Polar nulcei + Synergids

65. Which one normally fuses with male gamete to form zygote ?

(a) Polar nuclei (b) Synergids

(c) Antipodals (d) Egg Cell

66. The bisexual flowers which never open so as to effect self pollination are called _____.

(a) Cleistogamous

(b) Homogamous

(c) Dichogamous

(d) Herkogamous

67. Which are the special characteristics of entomophilous flowers ?

(a) Inconspicuous, light and produced in large numbers

(b) Have colour, nectar and scent.

(c) Provide shelter to the agents of pollination and have nectar.

(d) Flowers never open and homogamous

68. When pollen tuble enters through micropyle to effect fertilization in angiosperms, it is called :

(a) Chalazogamy

(b) Mesogamy

(c) Porogamy

(d) Herkogamy

69. What type of endosperm is seen in coconut?

(a) Nuclear

(b) Cellular

(c) Holobial

(d) Cellular and Helobial

70. In which family are endosperms absent ?

(a) Gramineae

(b) Orchidaceae

(c) Cruciferae

(d) Papilionaceae

71. In which case does endosperm contain mainly cellulose?

(a) Coconut

(b) Castor

(c) Black Pepper

(d) Rice

72. What is the major component of aleurone layer ?

(a) Fat

(b) Proteins

(c) Carbohydrate

(d) Oil

II. Fill in the blanks :

1. In flowering plants, the haploid male and female gametes fuse to form the diploid plant body called _____.
2. Microsporangia are borne in _____ part of stamens.
3. Pollen grains are the first cells of _____ Gametophyte.
4. Megaspore _____ cells are the last cells of sporophytic generation.
5. In flowering plants ovules develop into _____.
6. Anther wall layer that helps in dehyscence of microspores is called _____.
7. The innermost layer of anther wall which helps in the nourishment of developing pollens is known as _____.
8. The main component of exine of microspore wall is _____.
9. In insect pollinated flowers, exine is covered by yellowish, viscous and sticky substance called _____.
10. Ovules can be known as _____.
11. Normally, embryosac is seven-celled and _____ nucleated structure.
12. Unicellular zygote of flowering plants develops into multicellular _____.
13. One male gamete fuses with the egg cell of embryosac in the process of fertilization is called _____.
14. As a result of triple fusion, primary _____ cell is formed.
15. In _____ flowers, anthers and stigma mature at the same time.
16. Self pollinating, closed, bisexual flowers are called _____ flowers.
17. When stamens and carpels of the same flower mature at different times to effect cross pollination, then the condition is called _____.
18. After pollination, pollen germinates on _____ of the carpels.
19. When pollen tube enters through he micropyle of the ovule, it is called _____.
20. When pollen tube does not enter through micropyle and chalaza, but by penetrating integuments, it is called _____.
21. Endosperm persists in _____ seeds.
22. Endosperm is totally absent in _____.
23. When fruit develops from unfertilized eggs, it is called _____.
24. Formation of more than one embryo inside the ovule is called _____.
25. When fruit development takes place from other than ovary, it is called a _____ fruit.
26. Parthenogenesis means development of fruit without _____.

27. In some mature seeds, the residual nucellus persists after being consumed by embryo and it is called _____.

28. In ornithophily the agents for cross pollination are _____.

29. The cells present in two sides of egg in the egg apparatus are called _____.

30. Bisexual flowers which never open are called _____ or closed flowers.

31. When calyx and corolla are alike, they are called _____.

32. Androecium and _____ form essential whorls of a flower.

33. A root parasite possessing the largest flowers is _____.

34. When exine is covered by an yellowish viscous and sticky substance, it is called _____.

35. In dichogamous bisexual flower, when gynoecium matures first and androecium later so that cross pollination can be effected, the condition is called _____.

36. Diclinous flowers are also called _____.

III. Answer in one word :

1. Study of pollen grains -

2. Female gamete developing into a new individual -

3. Product of fusion of male and female gamete -

4. Stalk of the flower -

5. Innermost layer of anther wall that provide nourishment -

6. Stalk of ovule -

7. Product of triple fusion -

8. Unfertilized eggs developing into fruits-

9. Recurrent agamospermy -

10. End product of triple fusion -

11. Seeds without endosperm -

12. Fertilized / mature ovule -

13. Fertilized / mature ovary -

14. Product of syngamy -

15. The phase of rest of seeds before germination -

16. Which plants have the smallest flowrers ?

17. What are the plants having male and female flowers borne separately on the same plant called ?

18. The main body of the ovule is called:

IV. Correct the statements, if required by changing the underlined word/ words only :

1. The innermost layer of microsporangium is endothecium.
2. The product of syngamy is endosperm.
3. Embryo is a triploid structure.
4. Entry of pollen tube through micropyle is called misogamy.
5. The ovary is also known as megasporangium.
6. Anemophilous flowers are pollinated by ants and termites.
7. The ovule is attached to the placenta of ovary by means of nucellus.
8. Animals acting as agents of pollination is called aemophily.

V. Answer in one sentence :

1. What is meant by zygote ?
2. What is archesporium or archesporial cell ?
3. What is syngamy ?
4. What is amphimixis ?
5. How does primary endosperm cell develop ?
6. What is pollination ?
7. What is autogamy ?
8. What is the meaning of homogamy ?
9. What is diclinous condition ?
10. What is the meaning of self incompatibility in the process of sexual reproduction?
11. Where is the pollen pistil interactions initiated ?
12. Why is it called double fertilization and triple fusion in angiosperms ?
13. How may cells and how many nuclei are present in the mature embryosac before fertilization ?
14. What is a fruit ?
15. What is a seed ?
16. How does post fertilization development take place in helobial endosperm.
17. What are exalbuminous seeds ?
18. What are endospermous seeds ?
19. What is embryogeny ?
20. What is apomixis ?

Group - B

I. Write notes on the following in 2 to 3 sentences.

1. Parthenogenesis
2. Allogany
3. Herkogamy
4. Geitonogamy
5. Xenogamy
6. Self sterility
7. Entomophily
8. Embryosac
9. Polyembryony
10. Incompatibility
11. Megasporogenesis
12. Pollination
13. Oubreeding devices
14. Enxosperm
15. Apomixis

II. Differentiate between the following with two to three valid points :

1. Pollination and Fertilization
2. Dichogamy and Herkogamy
3. Protogyny and Protandry
4. Self pollination and Cross pollination
5. Embryo and Endosperm
6. Gamete and Zygote
7. Mycropyle and Chalaza
8. Zoophily and Anemophily
9. Double Fertilization and Triple Fusion
10. Porogamy and Chalazogamy
11. Apospory and Apogamy
12. Monocot Embryo and Dicot Embryo
13. Nuclear and Cellular Endosperm
14. Microspore and Megaspore
15. Exine and Intine
16. Egg Apparatus and Synergids
17. Indothecium and Tapetum
18. Auogamy and Geitonogamy
19. Geitonogamy and Xenogamy
20. Parthenocarphy and Parthenogenesis

Group - C

Long Answer Types Questions

1. Describe the development of male gametophyte in angiosperms.
2. Describe the development of female gametophyte in angiosperms.
3. Give an account of double fertilization and triple fusion in angiosperms.