Chapter 2

SEXUAL REPRODUCTION IN FLOWERING PLANTS

ONE MARK QUESTIONS:

1. Name the male reproductive structure of the flower. (K)
2. Name the female reproductive structure of the flower. (K)
3. How many thecae are present in a typical mature anther of angiosperms? (A)
4. What is a dithecous anther? (K)
5. How many microsporangia are present in a typical anther of angiosperms? (K)
6. How many microsporangia are present in each lobe of an anther? (K)
7. How many wall layers are present in a microsporangium? (K)
8. Name the innermost wall layer of microsporangium? (K)
9. What is the function of tapetum? (K)
10. What is a sporogenous tissue? (K)
11. Define microsporogenesis (K)
12. Name the tissue in the microsporangium which produces microspores. (K)
13. Which type of cell division occurs in pollen mother cell during microsporogenesis? (K)
14. If a microsporangium has 450 pollen mother cells, how many microspores are produced? (A)
15. What is the ploidy of functional microspore in flowering plants? (K)
16. What does pollen grain represent? (K)
17. Name the outer layer of pollen grain. (K)
18. Name the layer of pollen grain which is generally made of sporopollenin. (K)
19. Name the organic chemical present in exine of pollen grain. (K)
20. What is the biological significance of sporopollenin? (K)
21. What are germ pores? (K)
22. Name the region on the exine of pollen grains where sporopollenin is absent. (K)
23. Name the organic chemical present in intine of pollen grains. (K)
24. Name the large cell of a mature pollen grain. (K)
25. Name the small cell of a mature pollen grain. (K)
26. Why pollen grains are very well preserved as fossils? (K)
27. How many cells do a mature male gametophyte has in majority of angiosperms just before it germinates on the stigma? (K)
28. Name the cell in the male gametophyte of angiosperms which produces the male gametes (K)
29. Name the cell in the male gametophyte of angiosperms which produces the pollen tube. (K)
30. Name the solution used to promote pollen germination and formation of pollen tube. (K)
31. Arrange the following terms in the correct developmental sequence: (U)
32. Pollen grain, Sporogenous tissue, Microspore tetrad, Pollen mother cell, Male gametes
33. Give an example for a plant that causes pollen allergy. (K)
34. How are pollen grains preserved? (K)
35. What is a monocarpellary pistil? (K)
36. What is a multicarpellary pistil? (K)
37. What is a syncarpous pistil? (K)
38. What is an apocarpous pistil? (K)
39. What is megasporogenesis? (K)

40. Name the type of cell division that the megaspore mother cell undergoes? (K)
41. What is monosporic development of embryo sac? (K)
42. What is the ploidy of functional megaspore in flowering plants. (K)
43. What is chalaza? (K)
44. Name the basal part of an angiosperm ovule. (K)
45. Name the region of the ovule present opposite to the micropylar end. (K)
46. What is micropyle? (K)
47. Name the opening of the angiosperm ovule where the integument is absent. (K)
48. Name the opening of the ovule through which pollen tube enters. (K)
49. Name the stalk of the angiosperm ovule. (K)
50. What is funicle? (K)
51. Name the region on the body of the ovule to which the funicle is attached. (K)
52. What is hilum? (K)
53. What are the protective envelopes of the ovule called? (K)
54. What are integuments? (K)
55. What is nucellus? (K)
56. Name the nutritive tissue with reserve food present in an angiosperm ovule. (K)
57. Name the mass of cells enclosed within the integuments in an ovule. (K)
58. What is free-nuclear division of functional megaspore? (K)
59. Name the cells present at the micropylar end in the embryo sac. (K)
60. What is 'filiform apparatus'? (K)
61. Name the special cellular thickenings of the synergids. (K)
62. What is the function of filiform apparatus? (K)
63. Mention the number of nuclei found in a typical mature angiosperm embryo sac. (K)
64. Mention the number of cells found in a typical mature angiosperm embryo sac. (K)
65. Name the structure found inside the megasporangium which is 7-celled and 8-nucleated. (K)
66. Define pollination? (K)
67. The distribution of bryophytes and pteridophytes is limited with respect to sexual reproduction. Why? (A)
68. Define autogamy. (K)
69. What are chasmoganous flowers? (K)
70. Give one example for a chasmogamous flower. (K)
71. What are cleistogamous flowers? (K)
72. Give one example for a cleistogamous flower. (K)
73. Why cleistogamous flowers are invariably autogamous? (A)
74. Cleistogamy is advantageous to the plant. Why? (A)
75. Define geitonogamy. (K)
76. Even though geitonogamy is functionally cross pollination involving pollinating agents, it is genetically similar to autogamy. Why? (A)
77. Define xenogamy. (K)
78. Papaya plants exhibit xenogamy only. Why? (A)
79. Name the type of pollination that brings genetically different types of pollen to the stigma. (K)
80. Mention one abiotic agent used by plants to achieve pollination. (K)
81. Mention one biotic agent used by plants to achieve pollination. (K)
82. Give one example for wind pollinated plant. (K)

83. Give one example for water pollinated plant. (K)
84. How are pollen grains protected from wetting in water pollinated species? (U)
85. Which are the dominant pollinating agents among insects? (K)
86. Mention one important feature of insect pollinated flower. (K)
87. Mention one floral reward provided by the flower to a pollinating animal. (K)
88. Give an example for a plant that gives floral reward by providing safe place to lay insect eggs. (K)
89. Why wind and water pollinated flowers produce enormous amount of pollen when compared to the number of ovules available for pollination? (A)
90. What is the floral reward that the flower of *Amorphophallus* provides to pollinating agent? (K)
91. Name the plant which has the tallest flower. (K)
92. Some insects are called 'pollen robbers' or 'nectar robbers'. Why? (A)
93. Why many flowering plants have developed devices to discourage self pollination and encourage cross pollination? (A)
94. Mention one strategy evolved to prevent self-pollination in flowers. (K)
95. What is self incompatibility? (K)
96. What is pollen-pistil interaction? (K)
97. What is artificial hybridization? (K)
98. What is emasculation? (K)
99. Why bisexual flowers of a plant are emasculated in artificial hybridization? (A)
100. Why emasculated flowers are covered with bags of butter paper? (A)
101. What is bagging with reference to artificial hybridisation? (K)
102. What is triple fusion? (K)
103. What is double fertilization? (K)
104. What does the primary endosperm cell develop into? (K)
105. What is the ploidy of the primary endosperm cell? (K)
106. Expand PEN. (K)
107. What is embryogeny? (K)
108. Why do you think that the zygote is dormant for sometime immediately after fertilization in an ovule? (A)
109. What is epicotyl? (K)
110. What is hypocotyl? (K)
111. What is scutellum? (K)
112. What is coleorrhiza? (K)
113. What is coleoptile? (K)
114. What is seed? (K)
115. What are non-albuminous seeds? (K)
116. What are albuminous seeds? (K)
117. Give an example for a plant which produces albuminous seeds. (K)
118. Give an example for a plant which produces non–albuminous seeds. (K)
119. Seeds of pea, groundnut and beans are considered as non-albuminous seeds. Why? (A)
120. Seeds of wheat, maize, barley, castor, coconut and sunflower are considered as albuminous seeds. Why? (A)
121. Give one example for a seed in which the endosperm is completely consumed during the development of embryo. (K)
122. Give one example for a seed in which the endosperm may persist in a mature seed. (K)

123. What is perisperm? (K)
124. What is the residual persistent nucellus of a seed called? (K)
125. Give an example for a plant which produces seeds that has perisperm. (K)
126. What is pericarp? (K)
127. Name the protective wall of fruit. (K)
128. What is a false fruit? (K)
129. Why apple is called a false fruit? (A)
130. What is a true fruit? (K)
131. Give one example for a fleshy fruit. (K)
132. Give one example for a dry fruit. (K)
133. What are parthenocarpic fruits? (K)
134. Give an example for a plant which naturally produces parthenocarpic fruit. (K)
135. How can parthenocarpy be induced? (U)
136. What is apomixis? (K)
137. What is polyembryony? (K)

TWO MARK QUESTIONS:

1. Name the parts of an angiosperm flower in which development of male and female gametophytes takes place. (K)
2. Mention two differences between microsporogenesis and megasporogenesis. (U)
3. Name the male gametophyte of flowering plants. What is the ploidy of functional microspore in flowering plants? (K)
4. Mention four wall layers of microsporangium. (K)
5. What are the functions of tapetum of microsporangium and filiform apparatus of synergids? (K)
6. What is filiform apparatus? What is its significance? (K)
7. Differentiate syncarpous and apocarpous pistils. (U)
8. What are the functions of integument and nucellus of megasporangium. (K)
9. Define pollination. Mention three types of pollination. (K)
10. Differentiate autogamy and geitonogamy. (U)
11. Differentiate autogamy and xenogamy. (U)
12. Differentiate xenogamy and geitonogamy (U)
13. What is xenogamy? Mention its importance. (K)
14. Differentiate between chasmogamous and cleistogamous flowers. (A)
15. Mention two advantages of cleistogamy (K)
16. Mention one advantage and one disadvantage each of cleistogamy. (K)
17. Mention any two characteristic features of flowers that exhibit anemophily (K)
18. Mention any two characteristic features of flowers that are pollinated by animals (K)
19. Yucca plant and a species of moth cannot complete their life cycle without each other. Why? (U)
20. Mention any two outbreeding devices in angiosperms to prevent self pollination (K)
21. What is self incompatibility? Why self-pollination does not lead to seed formation in self incompatible species? (K)
22. What is artificial hybridisation ? Name the techniques that are employed to achieve this? (K)
23. What is meant by emasculation ? When does a plant breeder employ this technique? (U)
24. What is bagging technique? How is it useful in artificial hybridisation? (U)

25. With regard to artificial hybridization, what do you understand by emasculation and bagging techniques? (U)
26. What do you understand by double fertilization and triple fusion? (U)
27. Mention the four stages of embryogeny in a dicotyledonous embryo (K)
28. Distinguish between albuminous and non – albuminous seeds (U)
29. Differentiate hypocotyl and epicotyl. (U)
30. Differentiate coleoptile and coleorrhiza. (U)
31. Differentiate integument and testa. (U)
32. Differentiate perisperm and pericarp. (U)
33. What is perisperm? Give an example for a plant that produces seeds with perisperm. (K)
34. Mention two favourable conditions which promote the germination of seeds (K)
35. Mention two advantages that the seeds offer to angiosperms (K)
36. What are true fruits? Give an example for a plant that produces false fruit. (K)
37. What are false fruits? Give an example (K)
38. Why apple is called a false fruit? Which part of the flower also forms a part of the fruit in apple plant? (U)
39. Distinguish between true fruits and false fruits.. (U)
40. What are parthenocarpic fruits? Give an example for a plant that produces false fruit. (K)
41. Name the phenomenon of formation of seed without fertilization in angiosperms. Give an example for a plant which exhibits this phenomenon. (K)
42. What is parthenocarpic fruit? Mention a plant which naturally produces parthenocarpic fruit. (K)
43. What is apomixis and what is its importance? (K)
44. Define polyembryony. Mention an angiosperm which exhibits polyembryony (K)

THREE MARK QUESTIONS:

1. Draw a diagrammatic representation of the L.S. of a flower. (S)
2. Mention three differences between microsporogenesis and megasporogenesis. (K)
3. Draw a labeled diagram of transverse section of a young anther. (S)
4. Draw a labeled diagram of an angiosperm ovule. (S)
5. Explain the structure of a mature female gametophyte in flowering plants (K)
6. Differentiate autogamy, geitonogmy and xenogamy. (U)
7. Differentiate chasmogamous and cleistogamous flowers. How is cliestogamy advantageous ? (K)
8. Mention any three characteristic features of flowers that are pollinated by animals. (K)
9. List three characters of insect pollinated flowers. (K)
10. List three characters of wind pollinated flowers. (K)
11. Explain briefly pollination in *Vallisneria*. (U)
12. Explain briefly pollination in *Zostera*. (U)
13. Briefly describe three outbreeding devices in flowering plants. (K)
14. What is meant by emasculation? When does a plant breeder employ this technique and why? (K)
15. Write a short note on pollen-pistil interacton (K)
16. What is triple fusion? Where does it take place in the megasporangium? Name the nuclei involved in triple fusion. (K)
17. Draw a labeled diagram of a typical dicot embryo. (S)
18. Draw a labeled diagram of the L.S. of an embryo of grass. (S)
19. Explain the structure of a typical dicot embryo (U)

20. Explain the structure of a typical monocot embryo. (U)
21. Differentiate albuminous and non – albuminous seeds with an example for each. (U)
22. Mention three advantages offered by the seeds to angiosperms. (K)
23. Draw a diagram of the section of fruit in apple. (S)

FIVE MARK QUESTIONS:

1. Explain the T.S. of a microsporangium with a labeled diagram. (U)
2. Describe the structure of a mature male gametophyte (U)
3. Describe the structure of an anatropous ovule with a labeled diagram. (U)
4. Explain the structure of a typical dicot embryo with a labeled diagram. (U)
5. Explain the structure of a typical monocot embryo with a labeled diagram. (U)
6. Mention five differences between microsporogenesis and megasporogenesis. (K)
7. Explain the development of female gametophyte in angiosperms. (U)
8. Explain how some plants are adapted for achieving pollination through wind. (U)
9. How *Vallisneria* and *Zostera* achieve pollination? (U)
10. What is autogamy ? Explain the devices that the plants have developed to prevent this (K) + (U)
11. With a neat diagram, explain the structure of a mature female gametophyte of angiosperms. (U)
12. Why plants have developed devices to discourage self pollination? Explain the the devices that flowering plants have developed to encourage cross pollination. (U)
13. Give the definitions of the following: (K)
    (a) Perisperm (b) Pericarp (c) Parthenocarpic fruits (d) Apomixis (e) Polyembryony

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