

Shivaji University, Kolhapur
Question Bank For Mar 2022 (Summer) Examination

B.Sc. Part-II, Semester-III

Subject Code: 73303

Subject Name: Botany

Paper V: DSC C13: EMBRYOLOGY OF ANGIOSPERMS

Q.1 MULTIPLE CHOICE QUESTIONS

1. In angiosperms ----- are the essential whorls of flowers.
 - i) Androecium and Gynoecium
 - ii) Sepals and Gynoecium
 - iii) Sepals and Petals
 - iv) Petals and Stamens
2. ----- may be pointed, flattened or knob like structure adapted for the reception of the pollen.
 - i) Hilum
 - ii) Stigma
 - iii) Style
 - iv) Micropyle
3. Androgynophore is present in -----.
 - i) Passiflora
 - ii) Capparis
 - iii) Gynandropsis
 - iv) Michelia
4. Germ pore is an area where exine is -----.
 - i) Thick
 - ii) Absent
 - iii) Thick and Uniform
 - iv) Uniform
5. Hydrophily occurs in -----.
 - i) Nymphaea
 - ii) Eicchornia
 - iii) Nelumbo
 - iv) Vallisneria
6. In ----- ovule funicle is very much long forming a complete circle around the orthotropous ovule.
 - i) Anatropous
 - ii) Amphitropous
 - iii) Circinotropous
 - iv) Hemianatropous
7. Embryo sac is -----.

- i) Microgametophyte ii) Microsporangium
iii) Megagametophyte iv) Megasporangium
8. Polygonum type of embryo sac is ----- nucleate.
i) 8 ii) 16
iii) 24 iv) 32
9. In Allium, Scilla and Trillium ----- type of embryo sac is present.
i) Monosporic ii) Bisporic
iii) Trisporic iv) Tetrasporic
10. Fertilization process in plants was first discovered by -----.
i) Hanstein (1870) ii) Johansen (1950)
iii) Strasburger (1884) iv) Maheshwari (1950)
11. The embryonal shoot (plumule) is developed from -----.
i) hypocotyl ii) epicotyl
iii) suspensor iv) haustorial cell
12. Anemophily is pollination by -----.
i) Bats ii) Birds
iii) Wind iv) Animals
13. In ----- pollens are enclosed in pollinia
i) Euphorbia ii) Calotropis
iii) Passiflora iv) Capparis
14. Tapetum occurs in -----.
i) Anther wall ii) Ovary wall
iii) Male Gametophyte iv) Female Gametophyte
15. Double fertilization means fusion of one sperm nucleus with egg nucleus and other sperm nucleus with -----.
i) antipodal cells ii) synergids
iii) secondary nucleus iv) tube nucleus
16. Double fertilization was first described by -----.
i) Nawaschin and Guignard (1898) ii) Johansen (1950)
iii) Strasburger (1884) iv) Maheshwari (1950)
17. The ----- type of embryo sac development is very common in angiosperms.
i) Cycas ii) Polygonum
iii) Pinus iv) Allium
18. In typical embryo sac ----- nuclei are present.

i) 6

ii) 8

iii) 12

iv) 24

19. In ----- pollen tube enters through funicle or integument of the ovule.

i) Progamy

ii) Chalazogamy

iii) Syngamy

iv) Mesogamy

20. In angiosperms triple fusion is required for the formation of -----.

i) Embryo

ii) Suspensor

iii) Fruit wall

iv) Endosperm

21. Coleoptile is covering of -----.

i) hypocotyl

ii) radicle

iii) plumule

iv) root cap

22. Coconut milk is an example of -----endosperm.

i) nuclear

ii) cellular

iii) helobial

iv) acellular

23. The terminal cell of the two celled proembryo divides by longitudinal wall in ----- type of embryo development.

i) crucifer

ii) solanad

iii) caryophyllod

iv) chenopodial

24. Jeffrey (1895) reported cleavage polyembryony in -----.

i) Empetrum nigrum

ii) Erythronium americanum

iii) Eulophia epidendrea

iv) Nymphaea advena

25. Formation of embryo from vegetative cells derived from zygote is called -----.

i) Apomixis

ii) Adventive Polyembryony

iii) Apospory

iv) Diploid Polyembryony

26. In angiosperms ----- are the non-essential whorls of flowers.

i) Androecium and Gynoecium

ii) Sepals and Gynoecium

iii) Sepals and Petals

iv) Petals and Stamens

27. The nutritive cells ----- nourishes the developing microspores.

i) Epidermis

ii) Tapetum

iii) Endothecium

iv) Intine

28. Androgynophore is present in -----.

i) Passiflora

ii) Capparis

iii) Gynandropsis

iv) Michelia

29. The exine of pollen is composed of -----.

- | | |
|--------------------|---------------|
| i) Pollen kit | ii) Cellulose |
| iii) Sporopollenin | iv) Lignin |
30. Hydrophily occurs in -----.
- | | |
|--------------|-----------------|
| i) Nymphaea | ii) Eichhornia |
| iii) Nelumbo | iv) Vallisneria |
31. In ----- ovule, funicle, chalaza and micropyle lie in one vertical line.
- | | |
|---------------------|------------------|
| i) Anatropous | ii) Amphitropous |
| iii) Circinotropous | iv) Orthotropous |
32. The male germ unit (MGU) in angiosperms comprises of -----.
- i) vegetative nucleus and the generative cell
 - ii) the two sperm cells
 - iii) vegetative nucleus and one sperm
 - iv) vegetative nucleus and the two sperms
33. Double fertilization is observed in -----.
- | | |
|------------|-----------------|
| i) Adoxa | ii) Fritillaria |
| iii) Drusa | iv) Endymion |
34. Campylotropous ovules are found in -----.
- | | |
|------------------|------------|
| i) Pisum | ii) Yucca |
| iii) Abelmoschus | iv) Dahlia |
35. Filiform apparatus is found in the -----.
- | | |
|----------------|---------------|
| i) egg | ii) suspensor |
| iii) endosperm | iv) synergids |
36. The lower end of the embryonal axis has a radical and root cap enclosed in an undifferentiated part of the embryo called -----.
- | | |
|-----------------|---------------|
| i) coleorhiza | ii) scutellum |
| iii) coleoptile | iv) epiblast |
37. Entomophily is pollination by -----.
- | | |
|------------|----------|
| i) Insect | ii) Wind |
| iii) Water | iv) Bird |
38. During microsporogenesis spore mother cell undergoes meiotic division and gives rise to ---- microspores.
- | | |
|--------|---------|
| i) one | ii) two |
|--------|---------|

- iii) three
iv) four
39. The Polygonum type of embryo sac is -----.
- i) Bisporic eight-nucleate
ii) Monosporic four-nucleate
iii) Tetrasporic sixteen-nucleate
iv) Monosporic eight-nucleate
40. The process in which one sperm nucleus fuses with egg nucleus and the other sperm nucleus fuses with secondary nucleus is called as -----.
- i) Polygamy
ii) Pollination and Fertilization
iii) Heterospermy
iv) Double fertilization and Triple Fusion
41. In ----- pollen tube enters through funicle or integument of the ovule.
- i) Progamy
ii) Chalazogamy
iii) Syngamy
iv) Mesogamy
42. The ----- type of embryo sac development is very common in angiosperms.
- i) Cycas
ii) Polygonum
iii) Pinus
iv) Allium
43. In typical embryo sac ----- nuclei are present.
- i) 6
ii) 8
iii) 12
iv) 24
44. In a typical dicotyledonous embryo the cylindrical portion below the level of cotyledons is -----.
- i) scutellum
ii) epicotyl
iii) hypocotyl
iv) radicle
45. The endosperm of Angiosperms develops from -----.
- i) antipodals
ii) zygote
iii) synergids
iv) secondary nucleus
46. The scutellum in a grass embryo is equivalent to ----- in the embryos of other monocots.
- i) hypocotyl
ii) radicle
iii) plumule
iv) cotyledon
47. Coconut copra (solid white endosperm) is an example of -----endosperm.
- i) nuclear
ii) cellular
iii) helobial
iv) acellular
48. Substitute for sexual reproduction is -----.
- i) fusion
ii) syngamy
iii) apomixis
iv) agamy

49. In Citrus, adventive embryos are derived from -----.
- | | |
|----------------|--------------------|
| i) Integuments | ii) Nucellus |
| iii) Synergids | iv) Zygotic embryo |
50. Polyembryony is a predominant feature in the species of -----.
- | | |
|--------------|-------------|
| i) Mangifera | ii) Opuntia |
| iii) Eugenia | iv) Citrus |
51. Accessory whorls of flower are -----.
- | | |
|-----------------------------|--------------------------|
| i) Androecium and Gynoecium | ii) Sepals and Gynoecium |
| iii) Sepals and Petals | iv) Petals and Stamens |
52. According to ----- flower is a modified shoot.
- | | |
|---------------|------------------|
| i) Aristotle | ii) Theophrastus |
| iii) Goebbles | iv) Goethe |
53. Internodes between stamen and petal is -----.
- | | |
|--------------------|-------------------|
| i) gynophore | ii) androphore |
| iii) gynandrophore | iv) None of these |
54. Pollen tube emerges through -----.
- | | |
|-----------|---------------|
| i) intine | ii) exine |
| iii) germ | iv) germ pore |
55. Vallisneria is -----.
- | | |
|-----------------|-----------------|
| i) Polygamous | ii) Intersexual |
| iii) Monoecious | iv) Dioecious |
56. In ----- ovule funicle is very much long forming a complete circle around the orthotropous ovule.
- | | |
|---------------------|--------------------|
| i) Anatropous | ii) Amphitropous |
| iii) Circinotropous | iv) Hemianatropous |
57. Egg apparatus has one egg and -----.
- | | |
|--------------------|----------------------|
| i) two antipodals | ii) two polar nuclei |
| iii) two synergids | iv) None of these |
58. The tissue which attaches ovule to the ovary is -----.
- | | |
|------------|--------------|
| i) hilum | ii) placenta |
| iii) raphe | iv) funicle |
59. Actual union of the male gamete with the female gamete is called -----.
- | | |
|-----------------------|-----------------------|
| i) Fertilization | ii) Pollination |
| iii) Megasporogenesis | iv) Microsporogenesis |

60. Fertilization in which male gametes are carried through pollen tube is known as-----.

- i) Chalazogamy
- ii) Siphonogamy
- iii) Syngamy
- iv) Progamy

61. In anatropous ovules, the micropyle lies -----.

- i) in straight line with funicle
- ii) at right angles with the funicle
- iii) at 45° with funicle
- iv) Side by side with the funicle

62. Anemophily is pollination by -----.

- i) Bats
- ii) Birds
- iii) Wind
- iv) Animals

63. Normal type of embryo sac is found in -----.

- i) Cycas
- ii) Pinus
- iii) Polygonum
- iv) Allium

64. Campylotropous ovules are found in -----.

- i) Pisum
- ii) Yucca
- iii) Abelmoschus
- iv) Dahlia

65. In angiosperms the female gametophyte is the -----.

- i) Egg apparatus
- ii) Embryo
- iii) Synergids
- iv) Embryo sac

66. Double fertilization and triple fusion is the character of -----.

- i) Gymnosperms
- ii) Angiosperms
- iii) Pteridophytes
- iv) Algae

67. The ----- type of embryo sac development is very common in angiosperms.

- i) Cycas
- ii) Polygonum
- iii) Pinus
- iv) Allium

68. In ----- pollen tube enters through micropyle of the ovule.

- i) Progamy
- ii) Chalazogamy
- iii) Mesogamy
- iv) Syngamy

69. In angiosperms, ----- is the nutritive tissue in the embryo saiii)

- i) antipodal cells
- ii) secondary nucleus
- iii) zygote
- iv) endosperm

70. The endospermic nucleus is -----.

- i) haploid
- ii) diploid
- iii) triploid
- iv) tetraploid

71. Coleoptile is covering of -----.
- | | |
|--------------|--------------|
| i) hypocotyl | ii) radicle |
| iii) plumule | iv) root cap |
72. Coconut copra is an example of -----endosperm.
- | | |
|---------------|---------------|
| i) nuclear | ii) cellular |
| iii) helobial | iv) acellular |
73. Apomixis in plants means development of a plant -----.
- | | |
|-------------------------------|-------------------------------|
| i) from fusion of two gametes | ii) without fusion of gametes |
| iii) from stem cuttings | iv) from root cuttings |
74. Adventive embryo leads to the formation of -----.
- | | |
|-------------------|-------------------|
| i) one embryo | ii) half embryo |
| iii) many embryos | iv) None of these |
75. When vegetative cells of zygote give rise to embryo, it is called as -----.
- | | |
|-------------------------|----------------------------|
| i) Diploid Polyembryony | ii) Adventive Polyembryony |
| iii) Apomixis | iv) Apospory |
76. The region of elongated internode between androecium and gynoecium is called as -----
- | | |
|---------------------|---------------|
| i) Androphore | ii) Gynophore |
| iii) Androgynophore | iv) Style |
77. The ----- nourishes the developing microspores.
- | | |
|-------------------|-----------------|
| i) Epidermis | ii) Endothecium |
| iii) Middle layer | iv) Tapetum |
78. The typical embryo sac contain ----- structures.
- | | |
|-------------------------|------------------------|
| i) 7 celled, 8 nuclei | ii) 8 celled, 7 nuclei |
| iii) 8 celled, 8 nuclei | iv) 7 celled, 7 nuclei |
79. In Orchids, the pollen grains forming pollen masses are called -----.
- | | |
|------------------|-------------|
| i) Pollinia | ii) Tapetum |
| iii) Endothecium | iv) Anther |
80. During megasporogenesis, megaspore mother cell undergoes meiosis to produce ----- haploid megaspores.
- | | |
|-----------|-----------|
| i) Two | ii) Three |
| iii) Four | iv) Five |
81. ----- is the first cell of male gametophyte.
- | | |
|--------------|----------------|
| i) Megaspore | ii) Microspore |
|--------------|----------------|

iii) Androecium

iv) Anther

82. In ----- pollen grains are transferred from an anther of one flower to the stigma of another flower.

i) Self-Pollination

ii) Cross-Pollination

iii) Pollination

iv) Fertilization

83. In ----- type of pollination, small flowers usually remain underground and never open.

i) Homogamy

ii) Autogamy

iii) Cleistogamy

iv) Allogamy

84. In ----- both the male gametes take part in the fertilization i.e. the fertilization takes place twice.

i) Syngamy

ii) Double fertilization

iii) Triple fusion

iv) Microsporogenesis.

85. When pollination takes place with the help of insects, it is called as -----.

i) Anemophily

ii) Hydrophily

iii) Entomophily

iv) Chiropterophily

86. The unit member of the androecium is called as -----.

i) Sepal

ii) Petal

iii) Anther

iv) Stamen

87. In orchids, the pollen grains forming pollen masses are called -----.

i) Pollinium

ii) Tapetum

iii) Endothecium

iv) Anther

88. The typical embryo sac contains ----- Structures.

i) 7 celled,8 nuclei

ii) 8 celled,7 nuclei

iii) 8 celled,8 nuclei

iv) 7 celled,7 nuclei

89. In ----- ovule funicle is very long forming circle around the ovule.

i) Orthotropous

ii) Anatropous

iii) Circinotropous

iv) Amphitropous

90. Actual union of the male gamete with the female gamete is called -----.

i) Fertilization

ii) Pollination

- iii) Megasporogenesis iv) Microsporogenesis
91. The process of development of embryo from zygote is called -----.
- i) Microsporogenesis ii) Megasporogenesis
iii) Embryogenesis iv) Polyembryony.
92. *Cocos nucifera* is the classical example of ----- endosperm
- i) Helobial ii) Cellular
iii) Nucellar iv) Apomixis
93. Polyembryony is commonly occurs in -----.
- i) Mango ii) Citrus
iii) Coconut iv) Custard apple
94. In angiosperms seeds and fruit are formed without pollination and fertilization is known as -----.
- i) Parthenocarpy ii) Polyembryony
iii) Pseudogamy iv) Apomixis
95. When the embryo sac is developed from nucellar cells is referred as -----.
- i) Apospory ii) Agamospory
iii) Diplospory iv) Syngamy
96. The nutritive cells ----- nourishes the developing microspores.
- i) Epidermis ii) Tapetum
iii) Endothecium iv) Intine
97. The body of ovule is completely inverted in ----- ovule.
- i) Orthotropous ii) Anatropous
iii) Circinotropous iv) Amphitropous
98. The process of transfer of pollen grains from an anther to the stigma of a flower is known as -----.
- i) Pollination ii) Fertilization
iii) Megasporogenesis iv) Microsporogenesis
99. ----- is the first cell of female gametophyte.
- i) Microspore ii) Megaspore
iii) Tetraspore iv) Anther
100. In ----- type of pollination, a small flower usually remain underground and never open.
- i) Homogamy ii) Autogamy
iii) Cleistogamy iv) Allogamy
101. The multinucleate liquid endosperm of coconut is called as -----.

- i) Ruminant endosperm ii) Liquid syncytium
 iii) Helobial endosperm iv) Meat
102. In angiosperms, after fusion of male nucleus with secondary nucleus, it produces -----.
- i) Primary endosperm ii) Zygote
 iii) Embryo iv) Cotyledons.
103. The helobial type of endosperm mostly reported in -----.
- i) Dicots ii) Monocots
 iii) Gymnosperms iv) Pteridophytes
104. The process of formation of embryo without fertilization is known as -----.
- i) Polyembryony ii) Apomixis
 iii) Amphimixis iv) Vivipary
105. In ----- embryony, the embryo develops from sporophytic tissue i.e. from nucellus or integuments.
- i) False ii) Adventive
 iii) Diplospory iv) Apospory.
106. The region of elongated internode between androecium and gynoecium is called -----.
- i) Androphore ii) Gynophore
 iii) Androgynophore iv) Style
107. In ----- ovule, funicle, chalaza and micropyle lie in one vertical line.
- i) Orthotropous ii) Anatropous
 iii) Circinotropous iv) Amphitropous
108. When pollination takes place with the help of insects, is called -----.
- i) Anemophily ii) Hydrophily
 iii) Entomophily iv) Chiropterophily
109. During megasporogenesis, megaspore mother cell undergoes meiosis to produce ----- haploid megaspores.
- i) Two ii) Three
 iii) Four iv) Five
110. In ----- both the male gametes take part in the fertilization I.e. the fertilization takes place twice.
- i) Triple fusion ii) Double fertilization
 iii) Syngamy iv) Microsporogenesis
111. In angiosperms, endosperm is generally -----.
- i) Haploid ii) Diploid

iii) Triploid

iv) Tetraploid

112. When a seed contains more than one embryo, it is referred as -----.

i) Monoembryony

ii) Polyembryony

iii) Apomictic

iv) Multiovulate

113. In angiosperms, after fusion of male nucleus with egg nucleus, it produces -----.

i) Primary endosperm

ii) Zygote

iii) Embryo

iv) Cotyledons.

114. When the embryo sac is developed from nucellar cells is referred as -----.

i) Apospory

ii) Agamospory

iii) Diplospory

iv) Syngamy

115. Polyembryony is commonly occurs in -----.

i) Mango

ii) Citrus

iii) Coconut

iv) Custard apple

116. Generally coloured part of flower is

i) Sepal

ii) Petal

iii) Stalk

iv) Epicayx

117.) Fertilization is the process of

i) Transfer the pollen from anther to stigma

b) Fusion of male gamete with the egg

c) Formation of seed from ovule

d) Fusion of male nucleus with polar nuclei

118. Wind pollinated plants called as.....

a) Anemophilous b) Ornithophilous c) Hydrophilous d) **Entomophilous**

119)) In term angiosperm , angeion stands for

i) seed ii) fruit iii) **vessels** iv) trachieds

120)) The unit member of the Corolla is called as -----.

i) Sepal

ii) Petal

iii) Anther

iv) Stamen

121)

i) Wind ii) water iii) insect iv) birds

122) In angiosperms after fertilization zygote is -----.

- i) Haploid
- ii) Diploid
- iii) Triploid
- iv) Tetraploid

123)is fibrous tissue in anther

- i) Epidermis
- ii) Tapetum
- iii) Endothecium
- iv) Intine

Q.2 BROAD QUESTIONS

- 1) Define flower. Give the structure of a typical flower.
- 2) Explain the concept of flower as a modified shoot with reference to homology of a flower bud and axis nature of thalamus with suitable examples.
- 3) Explain the concept of flower as modified shoot with reference to leaf nature of floral members with suitable examples.
- 4) Describe the structure of a typical androecium.
- 5) Describe the structure of a typical gynoecium.
- 6) Describe the structure of a typical ovule.
- 7) Describe the structure of anatropous ovule.

- 8) Describe any five types of ovules in angiosperms.
- 9) Give the structure of typical androecium with tetrasporangiate anther.
- 10) Define pollination? Explain types of pollination in brief with suitable example.
- 11) Define pollination and explain contrivances of cross pollination with the help of any one example.
- 12) Describe anemophily with suitable example,
- 13) Describe hydrophily with suitable example,
- 14) Describe entomophily with suitable example.
- 15) What are methods of pollination? Describe contrivances of self-pollination.
- 16) Define pollination. Explain entomophily type of cross pollination in Calotropis.
- 17) Define pollination. Explain anemophily type of cross pollination in Zeamays.
- 18) Define pollination. Explain hydrophily type of cross pollination in Vallisnerii
- 19) Describe the process of microsporogenesis.
- 20) Describe the process of megasporogenesis.
- 21) What is fertilization? Discuss the process of fertilization in plants.
- 22) Describe double fertilization and triple fusion in angiosperms.
- 23) Explain different types of embryos in dicots.
- 24) Explain briefly development of embryo in dicots.
- 25) Describe the structure and development of dicotyledonous embryo with suitable diagram.
- 26) Explain briefly development of embryo in monocots.
- 27) Describe the structure and development of dicotyledonous embryo with suitable diagram.
- 28) What is polyembryony? Describe various types of polyembryony in angiosperms.
- 29) Explain briefly modifications of suspensors.

- 30) Describe the various types of endosperms found in angiosperms.
- 31) What is polyembryony? Give an account of several types of polyembryony in angiosperms.
- 32) What is polyembryony? Give a brief account with suitable examples.
- 33) Explain cleavage polyembryony with suitable examples
- 34) Explain adventive polyembryony with suitable examples.
- 35) Explain theories of causes of polyembryony.
- 36) What is apomixis? Describe various types of apomixis with suitable example.
- 37) Explain agamospermy reproduction in plant.
- 38) Explain in brief diplospory.

Q.3 SHORT NOTES

1. Homology of a flower
2. Axis nature of thalamus
3. Gynoecium
4. Androecium
5. T. S. of pollen wall
6. Pollen grain in angiosperm
7. Structure of pollen grain
8. Anatropous ovule
9. Orthotropous ovule
10. Pollination
11. Cross pollination

12. Cleistogamy
13. Pollination in Vallisneria
14. Pollination in Calotropis
15. Pollination in Maize
16. Adaptations in anemophily
17. Adaptations in hydrophily
18. Adaptations in entomophily
19. Pollen germination
20. Types of embryos in dicots
21. Suspensor and its modifications
22. Abnormal and reduced embryos
23. Embryo-endosperm relationship
24. Structure of typical monocot embryo
25. Structure of typical dicot embryo
26. Apomixis
27. Apospory
28. Adventive embryony
29. Parthenogenesis
30. Parthenocarpy
31. Causes and genetic basis of apomixis
32. Significance of apomixis.
33. Polyembryony
34. Embryoids

35. Cleavage polyembryony
36. Adventive polyembryony
37. False polyembryony
38. True polyembryony
39. Significance of polyembryony
40. Necrohormone theory
41. Cesca's hypothesis
- 42) Agamospory
- 43) Entomophily
- 44) Hydrophily.
- 45) Nuclear endosperm.
- 46) Structure of a typical flower
- 47) Types of ovules
- 48) Significance of double fertilization
- 49) Megasporogenesis
- 50) Flower as a modified shoot
- 51) Sketch and label typical flower
- 52) Monosporic embryo sac
- 53) Structure of typical gynoecium in angiosperms
- 54) Development of male gametophyte in angiosperms.