 Q1. Which of the following statements regarding tapetum is incorrect?

A. It provides nourishment to developing pollen.
B. It is a single-layered nutritive tissue.
C. It helps in the formation of exine layer.
D. It arises from epidermal layer of the anther.

Answer: D
Explanation: Tapetum is derived from the innermost layer of the anther wall, not the epidermis. It provides nourishment and secretes sporopollenin precursors for the exine.

 Q2. The function of the filiform apparatus in synergids is to:

A. Provide nutrition to the embryo
B. Guide the pollen tube into the ovule
C. Help in fertilization
D. Act as a reserve food material

Answer: B
Explanation: The filiform apparatus guides the pollen tube towards the egg apparatus inside the ovule.

 Q3. Match the following (Match the Column):

Column I	Column II
A. Antipodals	1. Pollen-pistil interaction
B. Synergids	2. Triploid tissue
C. Central cell	3. Degenerate after fertilization
D. Stigma	4. Guides pollen tube

Options:
A. A-3, B-4, C-2, D-1
B. A-4, B-2, C-3, D-1
C. A-2, B-1, C-4, D-3
D. A-1, B-3, C-4, D-2

Answer: A
Explanation:

Antipodals degenerate after fertilization

Synergids guide the pollen tube (via filiform apparatus)

Central cell forms the triploid endosperm

Stigma is involved in pollen-pistil interaction

 Q4. Double fertilization is:

A. One male gamete fuses with egg, other degenerates
B. One male gamete fuses with synergids, other with egg
C. One male gamete fuses with egg, other with central cell
D. Fusion of egg and polar nuclei only

Answer: C
Explanation: In double fertilization, one male gamete fuses with the egg (syngamy) and the other with the diploid central cell (triple fusion).

 Q5. Identify the correct sequence of events in microsporogenesis:

A. Microspore mother cell → meiosis → pollen tetrads → pollen grains
B. Pollen grains → microspore mother cell → meiosis → tetrads
C. Microspore mother cell → mitosis → microspores → tetrads
D. Pollen sac → pollen grains → microspore mother cells → gametes

Answer: A
Explanation: MMC undergoes meiosis to produce 4 microspores (tetrads), which develop into pollen grains.

 Q6. Assertion (A): Exine of pollen grain is made of sporopollenin.

Reason (R): Sporopollenin is the most resistant organic material known.

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, but R is not the correct explanation of A.
C. A is true, R is false.
D. A is false, R is true.

Answer: A
Explanation: Sporopollenin provides chemical and biological stability to the exine; hence, both statements are true and R explains A.

 Q7. The correct ploidy of the following is:

A. Egg cell, B. Antipodals, C. Secondary nucleus, D. Zygote

A. A-haploid, B-haploid, C-diploid, D-diploid
B. A-diploid, B-haploid, C-triploid, D-diploid
C. A-haploid, B-diploid, C-triploid, D-triploid
D. A-haploid, B-haploid, C-diploid, D-diploid

Answer: A
Explanation:

Egg cell & antipodals are haploid

Secondary nucleus is diploid before fertilization

Zygote is diploid after syngamy

 Q8. Which one of the following is an example of xenogamy?

A. Pollen from same flower reaches stigma of the same flower
B. Pollen from another flower on the same plant reaches stigma
C. Pollen from different plant of same species reaches stigma
D. Pollen from different species reaches stigma

Answer: C
Explanation: Xenogamy is cross-pollination between flowers of different plants of the same species.

 Q9. Which is not a feature of insect-pollinated flowers?

A. Brightly coloured petals
B. Fragrance and nectar
C. Dry and light pollen

D. Sticky stigma

Answer: C
Explanation: Dry and light pollen is a feature of wind pollinated flowers (anemophily), not entomophily (insect pollination).

 Q10. Which of the following plant shows chasmogamous and cleistogamous flowers?

A. Hibiscus
B. Oxalis
C. Cotton
D. Salvia

Answer: B
Explanation: Oxalis produces both types of flowers: open (chasmogamous) and closed (cleistogamous), ensuring autogamy under all conditions.

 Q11. In angiosperms, functional megaspore develops into:

A. Embryo sac
B. Nucellus
C. Integument
D. Ovule

Answer: A
Explanation: The functional megaspore (haploid) undergoes mitotic divisions to form the 7-celled, 8-nucleate embryo sac (female gametophyte).

 Q12. In an embryo sac, the cells that degenerate after fertilization are:

A. Central cell and egg cell
B. Synergids and antipodals
C. Egg cell and synergids
D. Synergids and central cell

Answer: B
Explanation: Synergids and antipodals degenerate after fertilization, while the zygote and primary endosperm nucleus form from fertilized egg and central cell.

 Q13. Choose the correct statement regarding endosperm formation in angiosperms:

A. It is always diploid.
B. It develops before fertilization.
C. It provides nourishment to the embryo.
D. It is formed from the fertilized egg cell.

Answer: C
Explanation: Endosperm provides nutrition to the developing embryo. It is usually triploid, formed by triple fusion.

 Q14. Identify the incorrect match:

Structure	Function
Pollen grain	Male gametophyte
Egg cell	Female gamete
Synergids	Zygote formation
Antipodals	Degenerate after fertilization

Answer: C
Explanation: Zygote is formed by fusion of egg cell with male gamete, not by synergids. Synergids only guide the pollen tube.

 Q15. Assertion (A): Cleistogamy ensures self-pollination.

Reason (R): In cleistogamous flowers, anthers and stigma are exposed to pollinating agents.

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, but R is not the correct explanation of A.
C. A is true, R is false.
D. A is false, R is true.

Answer: C
Explanation: Cleistogamy ensures self-pollination because the flowers never open; hence no exposure to pollinators.

 Q16. The event of fusion between one male gamete and the central cell is called:

A. Syngamy
B. Triple fusion
C. Fertilization
D. Autogamy

Answer: B
Explanation: Triple fusion involves fusion of male gamete with diploid central cell to form a triploid endosperm nucleus.

 Q17. Which part of pollen grain is made up of cellulose and pectin?

A. Exine
B. Intine
C. Sporopollenin
D. Aperture

Answer: B
Explanation: Intine is the inner layer of pollen wall, made up of cellulose and pectin.

 Q18. Which of the following is not a post-fertilization event?

A. Endosperm formation
B. Development of embryo
C. Pollination
D. Development of seed and fruit

Answer: C
Explanation: Pollination is a pre-fertilization event; the rest occur after fertilization.

 Q19. Which one of the following statements is true about double fertilization?

A. One male gamete fertilizes two eggs.
B. One male gamete fertilizes the egg and the other fertilizes the synergid.
C. One male gamete fertilizes the egg, another fuses with two polar nuclei.

D. Both male gametes fertilize the central cell.

Answer: C
Explanation: One gamete fuses with the egg (syngamy), the other fuses with two polar nuclei (triple fusion).

 Q20. In flowering plants, the zygote is:

A. Triploid, formed by double fertilization
B. Diploid, formed by fusion of male and egg cell
C. Haploid, formed by meiosis
D. Diploid, formed in the anther

Answer: B
Explanation: Zygote is diploid, formed by the fusion of haploid egg and haploid male gamete (syngamy).

 Q21. The characteristic feature of anemophilous flowers is:

A. Large, colorful petals
B. Fragrant and nectar-producing
C. Small, inconspicuous flowers and dry pollen
D. Sticky pollen and stigma

Answer: C
Explanation: Anemophilous (wind-pollinated) flowers are small, not showy, with light, dry pollen and large feathery stigma for catching pollen.

 Q22. Which of the following is correctly matched?

Column I	Column II
Geitonogamy	Same plant, different flowers
Autogamy	Same flower
Xenogamy	Different plants
All of these	Correct

Answer: D
Explanation: All matches are correct. These are types of pollination based on pollen source.

 Q23. In some angiosperms, pollen grains remain viable for months. This is commonly observed in:

A. Rice and wheat
B. Legumes
C. Rosaceae and Solanaceae
D. Members of family Poaceae

Answer: C
Explanation: In some families like Rosaceae and Solanaceae, pollen grains remain viable for long periods due to protective sporopollenin.

 Q24. Match the following columns:

Column I (Structure) Column II (Function)

A. Generative cell i. Produces male gametes
B. Tube cell ii. Forms pollen tube
C. Exine iii. Resistant outer layer
D. Synergids iv. Guide pollen tube into egg sac

Options:
A. A-i, B-ii, C-iii, D-iv ✅
B. A-ii, B-i, C-iv, D-iii
C. A-iv, B-ii, C-i, D-iii
D. A-i, B-iii, C-ii, D-iv

Answer: A
Explanation:

Generative cell: produces two male gametes

Tube cell: produces pollen tube

Exine: made of sporopollenin, very resistant

Synergids: help guide the pollen tube into the embryo sac.

 Q25. Which plant shows cleistogamy?

A. Hibiscus
B. Oxalis
C. Brassica
D. Datura

Answer: B
Explanation: Oxalis produces both open (chasmogamous) and closed (cleistogamous) flowers. Closed flowers ensure autogamy.

 Q26. The function of the filiform apparatus is:

A. Attraction of pollinators
B. Entry of pollen tube into ovule
C. Guiding pollen tube into synergid
D. Protection of ovule

Answer: C
Explanation: The filiform apparatus is present in synergids and helps guide the pollen tube to release the male gametes.

 Q27. Which of the following represents double fertilization correctly?

A. Egg + sperm → zygote; Polar nuclei + sperm → endosperm
B. Egg + sperm → endosperm; Synergid + sperm → zygote
C. Synergid + sperm → embryo; Egg + sperm → endosperm
D. Central cell + sperm → embryo; Egg + sperm → endosperm

Answer: A
Explanation: One sperm fertilizes the egg (zygote), the other fuses with polar nuclei (triploid endosperm).

 Q28. The term "monocarpellary pistil" refers to:

A. Ovary with many ovules
B. Pistil with fused carpels
C. Pistil with single carpel

D. Ovary with superior position

Answer: C
Explanation: Monocarpellary pistil has only one carpel, as seen in plants like pea and wheat.

 Q29. In mature embryo sac, the number of nuclei and cells respectively are:

A. 8 nuclei, 7 cells
B. 7 nuclei, 7 cells
C. 6 nuclei, 7 cells
D. 7 nuclei, 6 cells

Answer: A
Explanation: The embryo sac has 8 nuclei arranged into 7 cells — 3 antipodals, 2 synergids, 1 egg, and 1 central cell (with 2 nuclei).

 Q30. Assertion (A): Pollen grains are rich in nutrients.

Reason (R): They are used in the preparation of syrup and tablets in western countries.

A. A and R both are true, and R is correct explanation of A.
B. A and R both are true, but R is not correct explanation of A.
C. A is true, R is false.
D. Both A and R are false.

Answer: A
Explanation: Pollen grains are rich in proteins, vitamins, and are used as dietary supplements, especially in Western countries.

Q31. Tapetum in anther performs which of the following functions?

A. Provides nutrition to developing pollen
B. Forms integuments of ovule
C. Helps in pollen-pistil interaction
D. Forms embryo sac

Answer: A

Explanation: Tapetum is the innermost layer of the anther wall. It provides nutrition and enzymes for pollen development.

Q32. Assertion (A): Sporopollenin is considered the most resistant organic substance.

Reason (R): It can withstand high temperatures and enzymatic degradation.

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, but R is not the correct explanation of A.
C. A is true, R is false.
D. Both A and R are false.

Answer: A
Explanation: Sporopollenin protects pollen grains due to its chemical stability and resistance to degradation.

Q33. In angiosperms, functional megaspore develops into:

A. Embryo
B. Nucellus
C. Embryo sac
D. Antipodal cells

Answer: C
Explanation: Only one megaspore becomes functional and develops into the embryo sac by mitotic divisions.

Q34. Match the following:

Column I (Structure)	Column II (Chromosome number)
A. Antipodal cell	i. n
B. Zygote	ii. 2n
C. Endosperm cell	iii. 3n

Options:
A. A-i, B-ii, C-iii
B. A-iii, B-i, C-ii
C. A-i, B-iii, C-ii
D. A-ii, B-i, C-iii

Answer: A
Explanation: Antipodals are haploid (n), zygote is diploid (2n), endosperm is triploid (3n).

Q35. Statement-I: Synergids are essential for pollen tube guidance.

Statement-II: Synergids disintegrate after fertilization.

A. Both statements are true
B. Only Statement-I is true
C. Only Statement-II is true
D. Both statements are false

Answer: A
Explanation: Synergids secrete attractants for pollen tube guidance and degenerate after male gametes are released.

Q36. Which of the following best defines polyembryony?

A. Formation of multiple flowers from a single bud
B. Formation of many ovules in one ovary
C. Development of more than one embryo in a seed
D. Formation of multiple endosperms

Answer: C
Explanation: Polyembryony is seen in Citrus and onion where multiple embryos form within one seed.

Q37. Which of the following tissues produces the exine of pollen?

A. Endothecium
B. Middle layer
C. Tapetum
D. Epidermis

Answer: C
Explanation: Tapetum secretes precursors of sporopollenin which forms the exine layer of pollen.

Q38. Pollen-pistil interaction is best described as:

A. Random fusion of gametes
B. Physical blockage of pollen tube
C. Chemical signaling between pollen and pistil
D. Movement of ovules to pollen grains

Answer: C
Explanation: The stigma and style release chemical signals to recognize compatible pollen and guide the tube.

Q39. Assertion (A): Double fertilization is unique to angiosperms.

Reason (R): It leads to the formation of diploid zygote and diploid endosperm.

A. A is true, R is false
B. Both A and R are true, and R explains A
C. Both A and R are true, but R does not explain A
D. Both A and R are false

Answer: A
Explanation: Double fertilization results in diploid zygote and triploid endosperm, not diploid.

Q40. Which plant structure prevents inbreeding by promoting cross-pollination?

A. Embryo sac
B. Anther
C. Self-incompatibility genes
D. Ovary wall

Answer: C
Explanation: Self-incompatibility genes prevent self-pollen from fertilizing the ovule, ensuring genetic diversity.

Q41. Which among the following is incorrectly matched?

A. Ovule – Female gametophyte
B. Anther – Microspore production
C. Polar nuclei – Fertilize to form embryo
D. Synergid – Guides pollen tube

Answer: C
Explanation: Polar nuclei fuse with one male gamete to form endosperm, not the embryo.

Q42. Which of the following is a common example of apomixis?

A. Mustard
B. Citrus
C. Banana
D. Cotton

Answer: B
Explanation: Citrus shows nucellar polyembryony, a form of apomixis where embryos form without fertilization.

Q43. The function of antipodal cells is:

A. Participate in fertilization
B. Guide pollen tube
C. Nutritional role during embryo sac development
D. Form egg cell

Answer: C
Explanation: Though short-lived, antipodals are believed to support embryo sac with nutrients.

Q44. The ploidy of the central cell of embryo sac before and after fertilization is:

A. 2n → 3n
B. n → 2n
C. 2n → 2n
D. 3n → 2n

Answer: A
Explanation: Central cell contains two haploid polar nuclei (2n), and fertilization with sperm nucleus (n) forms 3n endosperm.

Q45. Match the following types of pollination with their correct examples:

Type of Pollination Example Plant

A. Autogamy i. Pea
B. Geitonogamyii. Maize
C. Xenogamy iii. Papaya

Options:
A. A-i, B-ii, C-iii
B. A-iii, B-i, C-ii
C. A-ii, B-iii, C-i
D. A-i, B-iii, C-ii

Answer: A
Explanation:

Autogamy → Pea (self-pollination within same flower)

Geitonogamy → Maize (same plant, different flowers)

Xenogamy → Papaya (cross-pollination between plants)