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Topic Covered

NCERT-II
Sexual Reproduction in Flowering Plants
+ Previous Topic

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TOPIC : [NCERT-II] Sexual Reproduction in Flowering

1. Which of the following is an advantage of sexual reproduction:
 - (1) It produces offspring faster than asexual reproduction.
 - (2) It creates new variants that enhance survival advantage.
 - (3) It ensures identical genetic makeup in progeny.
 - (4) It prevents all anthropogenic extinction.
2. Which of the following statements are correct:
 - I. A typical stamen consists of a filament and a terminal bilobed anther.
 - II. In most angiosperms, the anther is bilobed, with each lobe having two theca.
 - III. The proximal end of the anther is attached to the thalamus.
 - IV. A typical angiosperm anther contains four microsporangia, two in each lobe.
 - (1) I, II, III and IV
 - (2) I, III and IV only
 - (3) II and III only
 - (4) I, II and IV only
3. Panchanan Maheshwari developed a strong interest in Botany and morphology due to the influence of:
 - (1) His father
 - (2) Dr W. Dudgeon
 - (3) His classmates
 - (4) NCERT textbooks
4. A megaspore mother cell (MMC) in an angiosperm ovule is diploid ($2n = 16$). It undergoes meiosis to produce four megaspores. What is the chromosome number of each megaspore:
 - (1) 16
 - (2) 4
 - (3) 32
 - (4) 8

5. Consider the following statements about the significance of apomixis in agriculture:
 - (a) Hybrid seeds produced by apomictic plants do not segregate in the next generation.
 - (b) Farmers can reuse apomictic hybrid seeds year after year without loss of hybrid traits.
 - (c) Apomixis reduces the cost of hybrid seeds for farmers.
 - (d) Apomixis makes hybrid seeds genetically unstable.

Which of the statements are correct:

 - (1) a, b, d
 - (2) a, c, d
 - (3) b, c, d
 - (4) a, b, c
6. The diverse colours, structures, and fragrances of flowers primarily exist to:
 - (1) Attract humans for decoration and aesthetic purposes
 - (2) Aid in the process of sexual reproduction in plants
 - (3) Help plants perform photosynthesis more efficiently
 - (4) Protect plants from herbivores
7. Statement I: True fruits develop only from the ovary.
Statement II: In most species, fruits are formed only after fertilisation.
 - (1) Both Statement I and Statement II are true
 - (2) Both Statement I and Statement II are false
 - (3) Statement I is true, but Statement II is false
 - (4) Statement I is false, but Statement II is true
8. Assertion (A): In flowering plants, floral primordia develop only after hormonal and structural changes are initiated in the plant.
Reason (R): These changes lead to the formation of inflorescences, which bear floral buds that later differentiate into androecium and gynoecium.
 - (1) Both A and R are true, and R is the correct explanation of A.
 - (2) Both A and R are true, but R is not the correct explanation of A.
 - (3) A is true, but R is false.
 - (4) A is false, but R is true.

9. Which of the following statements are correct:
- (i) The filament attaches the anther to the thalamus or petal.
 - (ii) All flowers of different species show identical stamen size.
 - (iii) A longitudinal groove separates the theca in a typical anther.
 - (iv) Each anther lobe always contains only one microsporangium.
- (1) Only (i) and (iii) are correct
 - (2) Only (ii) and (iv) are correct
 - (3) Only (i) is correct
 - (4) (i), (iii) and (iv) are correct
10. Which of the following scientific contributions of Panchanan Maheshwari gained worldwide recognition:
- (1) Discovery of double fertilisation
 - (2) Work on test tube fertilisation and intra-ovarian pollination
 - (3) Development of electron microscope
 - (4) Discovery of plant hormones
11. The two parts of a flower where the male and female gametophytes develop, respectively, are:
- (1) Petals and sepals
 - (2) Anther and ovary
 - (3) Filament and style
 - (4) Thalamus and stigma
12. Which of the following statements are correct:
- (i) The outer three layers of the microsporangium help in protection and anther dehiscence.
 - (ii) Tapetal cells nourish developing pollen grains.
 - (iii) Tapetal cells usually contain dense cytoplasm and may become binucleate.
 - (iv) Endothecium is the innermost nutritive layer of the microsporangium.
- (1) (i), (ii), (iii) and (iv) are correct
 - (2) (ii) and (iv) are correct
 - (3) (i), (iii) and (iv) are correct
 - (4) (i), (ii) and (iii) are correct

13. Assertion (A): Tapetal cells often become binucleate during microsporangium development.
Reason (R): Tapetal cells may undergo mitosis without cytokinesis (nuclear division not followed by cell division), resulting in two nuclei within the same cell.
- (1) Both A and R are true, and R is the correct explanation of A.
 - (2) Both A and R are true, but R is not the correct explanation of A.
 - (3) A is true, but R is false.
 - (4) A is false, but R is true.
14. During microsporogenesis, meiotic division of a sporogenous cell produces a microspore tetrad. What is the ploidy of each microspore in the tetrad:
- (1) Diploid (2n)
 - (2) Triploid (3n)
 - (3) Haploid (n)
 - (4) Tetraploid (4n)
15. Which of the following best describes microsporogenesis:
- (1) Formation of pollen grains from the tapetum
 - (2) Formation of microspores from a pollen mother cell through meiosis
 - (3) Fusion of two microspores to form a pollen grain
 - (4) Release of pollen grains after anther dehiscence
16. Which of the following statements are correct:
- (i) Microsporangia later develop into pollen sacs that extend throughout the length of an anther.
 - (ii) A microsporangium in transverse section is nearly circular in outline.
 - (iii) The wall of a microsporangium consists of four layers: epidermis, endothecium, middle layers, and tapetum.
 - (iv) Tapetum is the outermost protective layer of the microsporangium.
- (1) (ii), (iii) and (iv) are correct
 - (2) (i) and (iv) are correct
 - (3) (i), (ii) and (iii) are correct
 - (4) (i), (ii), (iii) and (iv) are correct

17. What happens to the microspores in a microspore tetrad as the anther matures and dehydrates:

- (1) They fuse to form a single pollen grain
- (2) They dissociate and each develops into a pollen grain
- (3) They convert into sporogenous tissue
- (4) They become diploid again through mitosis

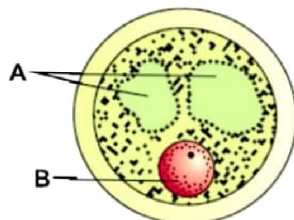
18. What do pollen grains represent in the life cycle of angiosperms:

- (1) The male sporophyte
- (2) The diploid embryo
- (3) The female gametophyte
- (4) The male gametophyte

19. Which of the following statements are correct:

- (i) Pollen grains are generally spherical and measure about 25-50 μm in diameter.
 - (ii) Exine is the inner thin wall made of cellulose and pectin.
 - (iii) Sporopollenin makes the exine highly resistant to heat and chemicals.
 - (iv) Germ pores are regions where sporopollenin is absent.
- (1) (i), (iii) and (iv) are correct
 - (2) (ii) and (iii) are correct
 - (3) (i), (ii) and (iv) are correct
 - (4) All statements are correct

20. Lable A, B and choose correct option



- (1) A - Vegetative cell, B - Generative cell
- (2) A - Vacuoles, B - Nucleus
- (3) A - Nucleus, B - Generative cell
- (4) A - Nucleus, B - Vacuole

21. If a plant has 100 ovules, and each MMC produces four megaspores but only one functional megaspore forms an embryo sac, how many functional female gametophytes will be produced:

- (1) 25
- (2) 50
- (3) 100
- (4) 400

22. Which of the following statements are correct:

- (i) Sporopollenin is one of the most resistant organic materials known.
- (ii) Because of sporopollenin, pollen grains are often well-preserved as fossils.
- (iii) Enzymes capable of degrading sporopollenin are widely found in nature.
- (iv) Germ pores allow emergence of the pollen tube.

- (1) (i), (ii) and (iv) are correct
- (2) (ii) and (iii) are correct
- (3) (i), (iii) and (iv) are correct
- (4) All statements are correct

23. Statement I: Fruits that develop from the ovary along with other floral parts, such as thalamus, are called false fruits.

Statement II: Apple, strawberry, and cashew are examples of false fruits.

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true, but Statement II is false
- (4) Statement I is false, but Statement II is true

24. Assertion (A): Pollen grains of many plant species can cause severe allergies and bronchial disorders in some individuals.

Reason (R): Pollen grains act as allergens that trigger immune reactions leading to respiratory problems like asthma and bronchitis.

- (1) Both A and R are true, and R is the correct explanation of A.
- (2) Both A and R are true, but R is not the correct explanation of A.
- (3) A is true, but R is false.
- (4) A is false, but R is true.

32. Match the following Column I with Column II:

| Column A (Terms) | Column B (Descriptions / Options) |
|---------------------|--|
| A. Funicle | i. Stalk connecting ovule to placenta |
| B. Hilum | ii. Junction between ovule and funicle |
| C. Integuments | iii. Protective envelopes surrounding nucellus |
| D. Chalaza | iv. Basal part of ovule opposite micropyle |

(1) A-i, B-iii, C-iv, D-ii

(2) A-ii, B-iii, C-iv, D-i

(3) A-i, B-iv, C-iii, D-ii

(4) A-i, B-ii, C-iii, D-iv

33. Consider the following statements about apomixis and polyembryony:

(a) Apomixis is the production of seeds without fertilisation.

(b) Polyembryony refers to the occurrence of more than one embryo in a seed.

(c) In apomictic seeds, embryos can arise from nucellar cells or diploid egg cells.

(d) Apomictic embryos are genetically different from the parent plant.

Which of the statements are correct:

(1) a, c, d

(2) a, b, d

(3) b, c, d

(4) a, b, c

34. With respect to angiosperms, identify the incorrect pair from the following

(1) Antipodals - $2n$

(2) Vegetative cell of male gametophyte - n

(3) Primary endosperm nucleus - $3n$

(4) Cells of nucellus of ovule - $2n$.

35. A single megaspore mother cell (MMC) undergoes meiosis to produce four megaspores. If only one megaspore develops into a functional embryo sac, what fraction of the original MMC contributes genetically to the female gametophyte:

(1) 1

(2) $1/2$

(3) $3/4$

(4) $1/4$

36. Statement I: Pollen grains of rice and wheat lose viability within 30 minutes after release.

Statement II: Pollen viability depends on species, temperature, and humidity.

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true, but Statement II is false

(4) Statement I is false, but Statement II is true

37. If a plant has 50 ovules, each with an MMC ($2n = 16$), and only one megaspore per ovule develops into a functional female gametophyte, what is the total number of chromosomes in all egg cells of plant :

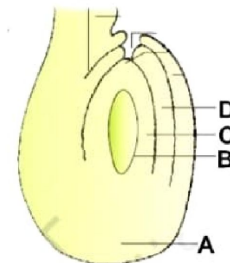
(1) 200

(2) 400

(3) 800

(4) 50

38. In given figures which represent female gametophyte



(1) A

(2) B

(3) C

(4) D

39. How many mitotic divisions does the functional megaspore undergo to form the 8-nucleate embryo sac:

- (1) One
- (2) Two
- (3) Three
- (4) Four

40. Assertion (A): The egg apparatus consists of two synergids and one egg cell at the micropylar end.

Reason (R): Synergids have filiform apparatus that guide the pollen tube into the egg apparatus.

- (1) Both A and R are true, and R is the correct explanation of A.
- (2) Both A and R are true, but R is not the correct explanation of A.
- (3) A is true, but R is false.
- (4) A is false, but R is true.

41. What is autogamy in flowering plants:

- (1) Transfer of pollen from one flower to another flower on a different plant
- (2) Transfer of pollen from the anther to the stigma of the same flower
- (3) Transfer of pollen by insects only
- (4) Transfer of pollen from the stigma to the anther

42. What is an advantage of cleistogamy for plants:

- (1) Ensures seed set even in the absence of pollinators
- (2) Promotes genetic variation through cross-pollination
- (3) Increases attraction of pollinators
- (4) Prevents self-pollination completely

43. Assertion (A): The central cell of the embryo sac contains two polar nuclei.

Reason (R): These polar nuclei fuse with one male gamete during double fertilization to form the endosperm.

- (1) Both A and R are true, and R is the correct explanation of A.
- (2) Both A and R are true, but R is not the correct explanation of A.
- (3) A is true, but R is false.
- (4) A is false, but R is true.

44. Which of the following statements about cleistogamous flowers is correct:

- (1) They are chasmogamous and open to expose anthers and stigma
- (2) They remain closed and always perform self-pollination
- (3) They are pollinated only by wind
- (4) They never produce seeds

45. Which of the following plants produce cleistogamous flowers that remain closed and perform self-pollination:

- (1) Rose, Lily, Tulip
- (2) Hibiscus, Sunflower, Mustard
- (3) Viola, Oxalis, Commelina
- (4) Mango, Papaya, Guava

46. Assertion (A): The functional megaspore undergoes three free-nuclear mitotic divisions to form the 8-nucleate embryo sac.

Reason (R): Free-nuclear mitosis means nuclear division occurs without immediate formation of cell walls.

- (1) Both A and R are true, and R is the correct explanation of A.
- (2) Both A and R are true, but R is not the correct explanation of A.
- (3) A is true, but R is false.
- (4) A is false, but R is true.

47. Which type of pollination is functionally cross-pollination but genetically similar to self-pollination:

- (1) Autogamy
- (2) Geitonogamy
- (3) Xenogamy
- (4) Cleistogamy

48. Which type of pollination introduces genetically different pollen to the stigma, increasing genetic variation:

- (1) Autogamy
- (2) Geitonogamy
- (3) Xenogamy
- (4) Cleistogamy

49. **Statement I: Wind-pollinated flowers produce large amounts of light, non-sticky pollen.**

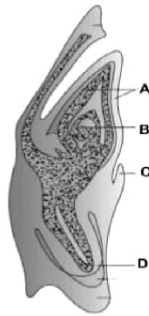
Statement II: Wind pollination ensures that pollen grains are easily transported by wind and increase chances of pollination.

- (1) Both Statement I and Statement II are true
 (2) Both Statement I and Statement II are false
 (3) Statement I is true, but Statement II is false
 (4) Statement I is false, but Statement II is true
50. **Consider the following statements regarding water- and wind-pollinated plants:**

- (i) **Water- and wind-pollinated flowers are generally not very colorful.**
 (ii) **These flowers do not produce nectar.**
 (iii) **The pollen grains in water-pollinated species are protected from wetting by a mucilaginous covering.**
 (iv) **All aquatic plants are pollinated by water currents.**

Choose the correct option:

- (1) i and ii only
 (2) i, ii, and iii only
 (3) i, iii, and iv only
 (4) All of the above
51. **Lable the A, B, C and D :**



- (1) A-Shoot apex, B-Coleoptile, C-Epiblast and D-Radicle
 (2) A-Coleoptile, B-Epiblast, C-Shoot apex and D-Radicle
 (3) A-Coleoptile, B-Shoot apex, C- Radicle and D-Epiblast
 (4) A-Coleoptile, B-Shoot apex, C-Epiblast and D-Radicle

52. **Given below are two statements :**

Statement I :

In wheat and maize endosperm completely consumed by developing embryo before seed maturation.

Statement II :

The wall of ovary develops into wall of fruit called perisperm.

Choose the correct answer from the options given below

- (1) Both Statement I and Statement II are incorrect
 (2) Statement I is correct but Statement II is incorrect
 (3) Statement I is incorrect but Statement II is correct
 (4) Both, Statement I and Statement II are correct

53. **Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R)**

Assertion (A)

Nectar and pollen grains are the usual floral rewards.

Reason (R)

***Amorhophallus* the flower itself is about 16 feet in height**

In the light of the above statements, choose the correct answer from the options given below :

- (1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 (2) (A) is correct but (R) is not correct
 (3) (A) is not correct but (R) is correct
 (4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

54. **Consider the following aquatic plants:**

Vallisneria, Hydrilla, Water lily, Water hyacinth

Statements:

- a. **Vallisneria and Hydrilla are pollinated by water.**
 b. **Water lily and Water hyacinth are pollinated by insects or wind.**
 c. **All given aquatic plants are pollinated by water currents.**

Choose the correct option

- (1) only a and b correct
 (2) only a and c correct
 (3) only b and c correct
 (4) All statements are correct

55. Which concentration of sugar solution is suggested for observing pollen germination:

- (1) 1%
- (2) 5%
- (3) 20%
- (4) 10%

56. Assertion (A): Both wind- and water-pollinated flowers are not very colorful and do not produce nectar.

Reason (R): These flowers do not need to attract insects or other animals for pollination, as their pollen is dispersed by abiotic agents (wind or water).

- (1) Both A and R are true, and R is the correct explanation of A.
- (2) Both A and R are true, but R is not the correct explanation of A.
- (3) A is true, but R is false.
- (4) A is false, but R is true.

57. In some species of monoecious flowers, pollen is released either before the stigma becomes receptive or stigma becomes receptive before pollen release. This device prevents:

- (1) Geitonogamy
- (2) Autogamy
- (3) Cross-pollination
- (4) Fertilization

58. Which of the following statements about animal pollinators is correct:

- i. Bees, butterflies, and moths are common insect pollinators of flowering plants.
 - ii. Only insects act as pollinators; larger animals never play a role.
 - iii. Even reptiles and some mammals can serve as pollinators in certain species.
- (1) i only
 - (2) i and ii only
 - (3) i and iii only
 - (4) All statements are correct

59. Self-incompatibility is a mechanism that prevents self-pollination by:

- (1) Altering flower color
- (2) Inhibiting pollen germination or pollen tube growth
- (3) Producing unisexual flowers
- (4) Changing anther position

60. In dioecious plants, male and female flowers are present on different plants. This condition prevents:

- (1) Autogamy only
- (2) Geitonogamy only
- (3) Both autogamy and geitonogamy
- (4) Cross-pollination

61. Embryo sac of angiosperms contains

- (1) 3 - celled egg apparatus, 3 antipodal cells and 2 polar nuclei
- (2) 2 - celled egg apparatus, 3 antipodal cells and 2 polar nuclei
- (3) 3 - celled egg apparatus, 2 antipodal cells and 1 polar nucleus
- (4) 3 - celled egg apparatus, 1 antipodal cell and 2 polar nuclei.

62. Statement I: In some species, flowers provide rewards by offering safe places for insects to lay their eggs.

Statement II: In the Yucca-moth relationship, the plant relies on the moth for pollination, and the moth relies on the plant for completing its life cycle.

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true, but Statement II is false
- (4) Statement I is false, but Statement II is true

63. Most flowering plants produce hermaphrodite flowers. Continued self-pollination in such plants may lead to:

- (1) Increased fertility
- (2) Inbreeding depression
- (3) Cross-pollination
- (4) Faster growth

64. The ability of the pistil to recognise and accept or reject pollen is due to:

- (1) Mechanical barriers only
- (2) A chemical dialogue between pollen and pistil
- (3) Wind pollination
- (4) Nectar production

65. After how much time can pollen tubes be observed under the microscope:

- (1) Immediately
- (2) 5 minutes
- (3) 15-30 minutes
- (4) 2 hours

66. A breeder emasculates flowers of the female parent and bags them. Later, the pollen of a different species is applied to the stigma Which of the following best explains why emasculation is essential in this process:

- (1) To make the flower more attractive to insects
- (2) To prevent the flower from producing seeds naturally
- (3) To ensure that self-pollen does not fertilize ovules, allowing controlled hybridization
- (4) To enhance fruit size

67. Consider the following statements about embryogeny in flowering plants:

- (i) Most zygotes divide only after a certain amount of endosperm is formed to ensure nutrition for the embryo.
- (ii) The early stages of embryo development are similar in both monocotyledons and dicotyledons.
- (iii) In dicot embryos, the portion of the embryonal axis above cotyledons is called the hypocotyl.
- (iv) In monocot embryos, the single cotyledon is called the scutellum and is lateral in position.

Which of the statements are correct:

- (1) i, ii, and iii only
- (2) i, ii, and iv only
- (3) ii, iii, and iv only
- (4) All of the above

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68. If a breeder skips the bagging step after emasculation, what is the most likely outcome:

- (1) Only the desired pollen will fertilize the ovules
- (2) The stigma may receive unwanted pollen
- (3) The flower will fail to produce any fruit
- (4) The male parent pollen will not germinate

69. Consider the following statements about seed longevity:

- (i) Seeds of some species remain viable for only a few months.
- (ii) All seeds remain viable for hundreds of years.
- (iii) *Lupinus arcticus* seed germinated after ~10,000 years.
- (iv) *Phoenix dactylifera* seed germinated after ~2,000 years.

Which of the statements are correct:

- (1) i, ii, iv
- (2) i, ii, iii
- (3) ii, iii, iv
- (4) i, iii, iv

70. In artificial hybridisation, the timing of pollen application is crucial. Which of the following explains the reason:

- (1) Pollen grains can germinate on any flower at any time
- (2) Stigma receptivity must coincide with pollen application to ensure successful fertilization
- (3) Pollen tubes grow instantly, so timing is irrelevant
- (4) Bagging will prevent fertilization regardless of timing

71. Consider the following statements regarding endosperm and seeds:

- (i) Free-nuclear endosperm is characterized by thousands of nuclei without cell walls.
- (ii) Cellularisation occurs after the free-nuclear stage to form cellular endosperm.
- (iii) In pea and groundnut, endosperm persists in the mature seed.
- (iv) Coconut kernel represents cellular endosperm, while coconut water is free-nuclear endosperm.

Which of the statements are correct:

- (1) i, ii, and iii only
- (2) i, ii, and iv only
- (3) ii, iii, and iv only
- (4) All of the above

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72. Regarding dicotyledonous embryos:

- (i) The embryonal axis has an epicotyl above cotyledons and a hypocotyl below cotyledons.
- (ii) The epicotyl terminates in the plumule (stem tip), while the hypocotyl terminates in the radicle (root tip).
- (iii) The radicle is covered with a root cap.
- (iv) Cotyledons are always single in dicots.

Which of the statements are correct:

- (1) All of the above
- (2) i, iii, and iv only
- (3) ii and iv only
- (4) i, ii, and iii only

73. Regarding monocotyledonous embryos (grasses):

- (i) They possess only one cotyledon, called the scutellum.
- (ii) The scutellum is situated laterally on the embryonal axis.
- (iii) The embryonal axis in monocots has epicotyl, hypocotyl, and radicle similar to dicots.
- (iv) Monocot embryos always have two cotyledons.

Which of the statements are correct:

- (1) i, ii, and iii only
- (2) i and ii only
- (3) ii and iv only
- (4) All of the above

74. Non-albuminous seeds are characterised by:

- (1) Retention of endosperm in mature seed
- (2) Complete consumption of endosperm during embryo development
- (3) Presence of perisperm
- (4) Lack of cotyledons

75. As ovules mature into seeds:

- (1) The ovary degenerates completely
- (2) The ovary develops into fruit and its wall forms the pericarp
- (3) The seed coat becomes fleshy
- (4) The perisperm is always absent

76. Regarding seed structure and germination, consider the following statements:

- (i) The integuments of ovules harden to form a protective seed coat.
- (ii) The micropyle facilitates entry of oxygen and water during germination.
- (iii) Seeds always remain metabolically active and never enter dormancy.
- (iv) Mature seeds have reduced water content (10-15%) to slow metabolic activity.

Which of the above statements are correct:

- (1) All of the above
- (2) i and iii only
- (3) ii, iii, and iv only
- (4) i, ii, and iv only

77. Statement I: Parthenocarpic fruits develop without fertilisation.

Statement II: Banana is an example of a parthenocarpic fruit, and parthenocarpy can be induced by applying growth hormones.

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true, but Statement II is false
- (4) Statement I is false, but Statement II is true

78. Consider the following statements about advantages of seeds in angiosperms:

- (i) Seed formation is more dependable.
- (ii) Seeds contain food reserves that support the young seedling.
- (iii) Seeds are always produced asexually in angiosperms.
- (iv) The hard seed coat protects the embryo.

Which of the above statements are correct:

- (1) i, ii, iii
- (2) i, ii, iv
- (3) ii, iii, iv
- (4) i, ii, iv

79. **Assertion (A):** A mature embryo sac is 8-nucleate but only 7-celled.

Reason (R): One of the cells in the embryo sac contains two nuclei (polar nuclei) and is not divided by a cell wall.

- (1) Both A and R are true, and R is the correct explanation of A
- (2) Both A and R are true, but R is not the correct explanation of A
- (3) A is true, but R is false.
- (4) A is false, but R is true.

80. **Assertion (A):** In artificial hybridisation, emasculation is done to prevent unwanted self-pollination.

Reason (R): Emasculation involves removing anthers from the flower bud before they release pollen.

- (1) Both A and R are true, and R is the correct explanation of A
- (2) Both A and R are true, but R is not the correct explanation of A
- (3) A is true, but R is false
- (4) A is false, but R is true

81. **Assertion (A):** Kingdom Protista includes both unicellular algae like *Chlamydomonas* and *Chlorella*, and unicellular organisms like *Paramecium* and *Amoeba*, which were earlier placed in different kingdoms.

Reason (R): The criteria for classification changed to consider body organisation, cell structure, nutrition, and evolutionary relationships rather than just morphology.

- (1) Both A and R are true, and R is the correct explanation of A
- (2) Both A and R are true, but R is not the correct explanation of A
- (3) A is true, but R is false
- (4) A is false, but R is true

82. In *Volvox* and *Fucus*, sexual reproduction is of which type:

- (1) Isogamous
- (2) Anisogamous
- (3) Oogamous
- (4) Fragmentation

83. Animals in which cells are arranged as loose cell aggregates without tissue organization belong to:

- (1) Coelenterata
- (2) Porifera
- (3) Annelida
- (4) Arthropoda

84. Which of the following books by Katherine Esau was referred to as the "Webster's of plant biology":

- (1) Plant Anatomy (1954)
- (2) The Anatomy of Seed Plants (1960)
- (3) Principles of Plant Physiology (1965)
- (4) Botany for Students (1952)

85. A molecule of haemoglobin carries oxygen molecules:

- (1) 1
- (2) 2
- (3) 3
- (4) 4

86. The body of *Periplaneta americana* is divided into how many distinct regions:

- (1) Two - head and abdomen
- (2) Three - head, thorax, and abdomen
- (3) Four - head, thorax, abdomen, and tail
- (4) Three - head, abdomen, and wings

87. Plants do not have specialised organs for gaseous exchange. Instead, they use:

- (1) Trachea and alveoli
- (2) Spiracles and tracheoles
- (3) Stomata and lenticels
- (4) Gills and lungs

88. In the elongation phase of growth, the main features of cells are:

- (1) Wall thickening and protoplasmic modifications
- (2) Cell division and plasmodesmatal connections
- (3) Increased vacuolation, cell enlargement, and new wall deposition
- (4) Loss of nuclei and programmed cell death

89. Which of the following respiratory organs is correctly matched with the animal group that uses it:

- (1) Sponges - Lungs
- (2) Earthworms - Moist cuticle
- (3) Adult Insects - Gills
- (4) Fishes - Tracheal tubes

90. Read the following and find the incorrect statement

- (1) GnRH is a hypothalamic hormone.
 - (2) The increased levels of GnRH then acts at the anterior pituitary gland and stimulates secretion of two gonadotropins
 - (3) Luteinising hormone (LH) and follicle stimulating hormone (FSH) are pituitary hormone
 - (4) LH acts at the Leydig cells and stimulates synthesis and secretion of estrogen
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