

Sexual Reproduction in Flowering Plants — NEET Biology PYQ (2005-2021)

Class 12 Biology · 76 real NEET & AIPMT questions, year-tagged · answers checked by RankUp

NEET 2021

1. A typical angiosperm embryo sac at maturity is :

- (A) 8-nucleate and 7-celled
- (B) 7-nucleate and 8-celled
- (C) 7-nucleate and 7-celled
- (D) 8-nucleate and 8-celled

NEET 2021

2. The term used for transfer of pollen grains from anthers of one plant to stigma of a different plant which, during pollination, brings genetically different types of pollen grains to stigma, is :

- (A) Xenogamy
- (B) Geitonogamy
- (C) Chasmogamy
- (D) Cleistogamy

NEET 2021

3. In some members of which of the following pairs of families, pollen grains retain their viability for months after release ?

- (A) Poaceae ; Rosaceae
- (B) Poaceae ; Leguminosae
- (C) Poaceae ; Solanaceae
- (D) Rosaceae ; Leguminosae

NEET 2020 · Q63

4. In water hyacinth and water lily, pollination takes place by:

- (A) insects or wind
- (B) water currents only
- (C) wind and water
- (D) insects and water

NEET 2020 · Q88

5. The body of the ovule is fused within the funicle at:

- (A) Hilum
- (B) Micropyle
- (C) Nucellus
- (D) Chalaza

NEET 2019 · Q111

6. Which one of the following statements regarding post-fertilization development in flowering plants is incorrect ?

- (A) Ovary develops into fruit
- (B) Zygote develops into embryo
- (C) Central cell develops into endosperm
- (D) Ovules develop into embryo sac

NEET 2019 · Q127

7. In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as :

- (A) Autogamy
- (B) Parthenocarpy
- (C) Syngamy
- (D) Parthenogenesis

NEET 2019 · Q128

8. Persistent nucellus in the seed is known as :

- (A) Chalaza
- (B) Perisperm
- (C) Hilum
- (D) Tegmen

NEET 2019 · Q142

9. What is the fate of the male gametes discharged in the synergid ?

- (A) One fuses with the egg, other(s) degenerate(s) in the synergid.
- (B) All fuse with the egg.
- (C) One fuses with the egg, other(s) fuse(s) with synergid nucleus.
- (D) One fuses with the egg and other fuses with central cell nuclei.

NEET 2018 · Q92

10. Double fertilization is

- (A) Fusion of two male gametes with one egg
- (B) Fusion of one male gamete with two polar nuclei
- (C) Fusion of two male gametes of a pollen tube with two different eggs
- (D) Syngamy and triple fusion

NEET 2018 · Q93

11. Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other?

- (A) Banana
- (B) Yucca
- (C) Hydrilla
- (D) Viola

NEET 2018 · Q94

12. Pollen grains can be stored for several years in liquid nitrogen having a temperature of

- (A) -196°C
- (B) -80°C
- (C) -120°C
- (D) -160°C

NEET 2018 · Q110

13. Which of the following has proved helpful in preserving pollen as fossils?

- (A) Oil content
- (B) Cellulosic intine
- (C) Pollenkitt
- (D) Sporopollenin

NEET 2017 · Q67

14. A dioecious flowering plant prevents both:

- (A) Autogamy and xenogamy
- (B) Autogamy and geitonogamy
- (C) Geitonogamy and xenogamy
- (D) Cleistogamy and xenogamy

NEET 2017 · Q71

15. Functional megaspore in an angiosperm develops into:

- (A) Ovule
- (B) Endosperm
- (C) Embryo sac
- (D) Embryo

NEET 2017 · Q76

16. Attractants and rewards are required for:

- (A) Anemophily
- (B) Entomophily
- (C) Hydrophily
- (D) Cleistogamy

NEET 2017 · Q114

17. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by:

- (A) Water
- (B) Bee
- (C) Wind
- (D) Bat

NEET 2017 · Q124

18. Double fertilization is exhibited by:

- (A) Gymnosperms
- (B) Algae
- (C) Fungi
- (D) Angiosperms

NEET 2017 (Gujarati paper) · Q90

19. Choose the correct sequence representing the ploidy of Nucellus; Megaspore mother cell; Megaspore; Egg cell; Zygote; A polar nucleus of embryo sac; Secondary nucleus and Primary endosperm nucleus.

- (A) $2n$; $2n$; n ; $2n$; n ; $2n$; $3n$ and $2n$
- (B) $2n$; $2n$; n ; n ; $2n$; n ; $2n$; and $3n$
- (C) $2n$; n ; n ; $2n$; $3n$; $2n$; n and $3n$
- (D) n ; $2n$; $2n$; n ; $2n$; n ; $2n$ and $2n$

NEET 2017 (Gujarati paper) · Q95

20. The hollow foliar structure in a wheat embryo that encloses the shoot apex and a few leaf primordia is called:

- (A) Coleorrhiza
- (B) Epicotyl
- (C) Hypocotyl
- (D) Coleoptile

NEET 2017 (Gujarati paper) · Q112

21. Pollen grains can be stored for years in liquid nitrogen, maintained at temperature:

- (A) -20°C
- (B) -70°C
- (C) -196°C
- (D) -120°C

NEET 2017 (Gujarati paper) · Q119

22. Continued self-pollination results in:

- (A) Heterosis
- (B) Inbreeding depression
- (C) Polyembryony
- (D) Genetic drift

NEET 2017 (Gujarati paper) · Q126

23. What is not true for an angiospermic embryo sac?

- (A) It is present within an ovule.
- (B) It represents female gametophyte.
- (C) Its formation is preceded by meiosis.
- (D) One male gamete is discharged into it during fertilization.

NEET 2016 Phase 2 · Q117

24. In majority of angiosperms

- (A) egg has a filiform apparatus
- (B) there are numerous antipodal cells
- (C) reduction division occurs in the megaspore mother cells
- (D) a small central cell is present in the embryo sac

NEET 2016 Phase 2 · Q118

25. Pollination in water hyacinth and water lily is brought about by the agency of

- (A) water
- (B) insects or wind
- (C) birds
- (D) bats

NEET 2016 Phase 2 · Q119

26. The ovule of an angiosperm is technically equivalent to

- (A) megasporangium
- (B) megasporophyll
- (C) megaspore mother cell
- (D) megaspore

NEET 2016 Phase 1 · Q93

27. The coconut water from tender coconut represents:

- (A) Endocarp
- (B) Fleshy mesocarp
- (C) Free nuclear proembryo
- (D) Free nuclear endosperm

NEET 2016 Phase 1 · Q130

28. Proximal end of the filament of stamen is attached to the:

- (A) Anther
- (B) Connective
- (C) Placenta
- (D) Thalamus or petal

NEET 2016 Phase 1 · Q156

29. Which one of the following statements is not true?

- (A) Tapetum helps in the dehiscence of anther
- (B) Exine of pollen grains is made up of sporopollenin
- (C) Pollen grains of many species cause severe allergies
- (D) Stored pollen in liquid nitrogen can be used in the crop breeding programmes

NEET 2016 Phase 1 · Q162

30. Cotyledon of maize grain is called:

- (A) plumule
- (B) coleorhiza
- (C) coleoptile
- (D) scutellum

31. Seed formation without fertilization in flowering plants involves the process of:

- (A) Sporulation
- (B) Budding
- (C) Somatic hybridization
- (D) Apomixis

32. Which of the following statements is not correct?

- (A) Pollen grains of many species can germinate on the stigma of a flower, but only one pollen tube of the same species grows into the style.
- (B) Insects that consume pollen or nectar without bringing about pollination are called pollen/nectar robbers.
- (C) Pollen germination and pollen tube growth are regulated by chemical components of pollen interacting with those of the pistil.
- (D) Some reptiles have also been reported as pollinators in some plant species.

33. Which one of the following statements is not true?

- (A) Honey is made by bees by digesting pollen collected from flowers
- (B) Pollen grains are rich in nutrients, and they are used in the form of tablets and syrups
- (C) Pollen grains of some plants cause severe allergies and bronchial afflictions in some people
- (D) The flowers pollinated by flies and bats secrete foul odour to attract them

34. Which one of the following may require pollinators, but is genetically similar to autogamy?

- (A) Cleistogamy
- (B) Geitonogamy
- (C) Xenogamy
- (D) Apogamy

35. Which of the following are the important flora rewards to the animal pollinators?

- (A) Protein pellicle and stigmatic exudates
- (B) Colour and large size of flower
- (C) Nectar and pollen grains
- (D) Floral fragrance and calcium crystals

36. Transmission tissue is characteristic feature of

- (A) Wet stigma
- (B) Hollow style
- (C) Solid style
- (D) Dry stigma

37. Function of filiform apparatus is to:

- (A) Stimulate division of generative cell
- (B) Produce nectar
- (C) Guide the entry of pollen tube
- (D) Recognize the suitable pollen at stigma

38. Pollen tablets are available in the market for:

- (A) Breeding programmes
- (B) Supplementing food
- (C) Ex situ conservation
- (D) In vitro fertilization

AIPMT 2014

39. Geitonogamy involves:

- (A) fertilization of a flower by the pollen from the same flower
- (B) fertilization of a flower by the pollen from a flower of another plant in the same population
- (C) fertilization of a flower by the pollen from a flower of another plant belonging to a distant population
- (D) fertilization of a flower by the pollen from another flower of the same plant

AIPMT 2014

40. Male gametophyte with least number of cells is present in:

- (A) Funaria
- (B) Lilium
- (C) Pinus
- (D) Pteris

NEET 2013

41. Which one of the following statements is correct?

- (A) Hard outer layer of pollen is called intine
- (B) Sporogenous tissue is haploid
- (C) Endothecium produces the microspores
- (D) Tapetum nourishes the developing pollen

NEET 2013

42. Product of sexual reproduction generally generates

- (A) Longer viability of seeds
- (B) Prolonged dormancy
- (C) New genetic combination leading to variation
- (D) Large biomass

NEET 2013

43. Advantage of cleistogamy is

- (A) Higher genetic variability
- (B) More vigorous offspring
- (C) No dependence on pollinators
- (D) Vivipary

NEET 2013

44. Perisperm differs from endosperm in

- (A) Being a haploid tissue
- (B) Having no reserve food
- (C) Being a diploid tissue
- (D) Its formation by fusion of secondary nucleus with several sperms

AIPMT 2012 Mains

45. What is the function of germ pore ?

- (A) Emergence of radicle
- (B) Absorption of water for seed germination
- (C) Initiation of pollen tube
- (D) Release of male gametes

AIPMT 2012 Mains

46. Which one of the following statements is wrong ?

- (A) When pollen is shed at two-celled stage, double fertilization does not take place
- (B) Vegetative cell is larger than generative cell
- (C) Pollen grains in some plants remain viable for months
- (D) Intine is made up of cellulose and pectin

AIPMT 2012 Mains

47. Plants with ovaries having only one or a few ovules are generally pollinated by

- (A) Bees
- (B) Butterflies
- (C) Birds
- (D) Wind

AIPMT 2012 Prelims

48. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is

- (A) Cellulose
- (B) Cuticle
- (C) Sporopollenin
- (D) Lignin

AIPMT 2012 Prelims

49. Both, autogamy and geitonogamy are prevented in

- (A) Maize
- (B) Papaya
- (C) Cucumber
- (D) Castor

AIPMT 2012 Prelims

50. Even in absence of pollinating agents seed-setting is assured in

- (A) Fig
- (B) Commelina
- (C) Zostera
- (D) Salvia

AIPMT 2012 Prelims

51. The coconut water and the edible part of coconut are equivalent to

- (A) Embryo
- (B) Endosperm
- (C) Endocarp
- (D) Mesocarp

AIPMT 2011 Mains

52. What is common between vegetative reproduction and Apomixis ?

- (A) Both occur round the year
- (B) Both produce progeny identical to the parent
- (C) Both are applicable to only dicot plants
- (D) Both bypass the flowering phase

AIPMT 2011 Mains

53. In angiosperms, functional megaspore develops into

- (A) Endosperm
- (B) Pollen sac
- (C) Embryo sac
- (D) Ovule

AIPMT 2011 Prelims

54. Nucellar polyembryony is reported in species of

- (A) Brassica
- (B) Citrus
- (C) Gossypium
- (D) Triticum

AIPMT 2011 Prelims

55. Filiform apparatus is a characteristic feature of

- (A) Zygote
- (B) Suspensor
- (C) Egg
- (D) Synergid

AIPMT 2011 Prelims

56. What would be the number of chromosomes of the aleurone cells of a plant with 42 chromosomes in its root tip cells?

- (A) 21
- (B) 42
- (C) 63
- (D) 84

AIPMT 2011 Prelims

57. Wind pollination is common in

- (A) Orchids
- (B) Legumes
- (C) Lilies
- (D) Grasses

AIPMT 2011 Prelims

58. In which one of the following pollination is autogamous?

- (A) Cleistogamy
- (B) Geitonogamy
- (C) Xenogamy
- (D) Chasmogamy

AIPMT 2010 Prelims · Q160

59. Apomictic embryos in citrus arise from

- (A) Diploid egg
- (B) Synergids
- (C) Maternal sporophytic tissue in ovule
- (D) Antipodal cells

AIPMT 2010 Prelims · Q161

60. Wind pollinated flowers are

- (A) Small, producing nectar and dry pollen
- (B) Small, brightly coloured, producing large number of pollen grains
- (C) Small, producing large number of dry pollen grains
- (D) Large, producing abundant nectar and pollen

AIPMT 2010 Prelims · Q163

61. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called

- (A) Autogamy
- (B) Xenogamy
- (C) Geitonogamy
- (D) Karyogamy

AIPMT 2008 Prelims · Q138

62. Endosperm is consumed by developing embryo in the seed of

- (A) Maize
- (B) Coconut
- (C) Castor
- (D) Pea

AIPMT 2008 Prelims · Q159

63. Which one of the following is resistant to enzyme action?

- (A) Leaf cuticle
- (B) Cork
- (C) Wood fibre
- (D) Pollen exine

AIPMT 2008 Prelims · Q161

64. Which one of the following pairs of plant structures has haploid number of chromosomes?

- (A) Egg nucleus and secondary nucleus
- (B) Megaspore mother cell and antipodal cells
- (C) Egg cell and antipodal cells
- (D) Nucellus and antipodal cells

AIPMT 2008 Prelims · Q162

65. What does the filiform apparatus do at the entrance into ovule?

- (A) It guides pollen tube from a synergid to egg
- (B) It helps in the entry of pollen tube into a synergid
- (C) It prevents entry of more than one pollen tube into the embryo sac
- (D) It brings about opening of the pollen tube

AIPMT 2008 Prelims · Q163

66. Unisexuality of flowers prevents

- (A) Autogamy and geitonogamy
- (B) Autogamy, but not geitonogamy
- (C) Both geitonogamy and xenogamy
- (D) Geitonogamy, but not xenogamy

AIPMT 2007 Prelims · Q111

67. Which one of the following is surrounded by a callose wall?

- (A) male gamete
- (B) egg
- (C) pollen grain
- (D) microspore mother cell

AIPMT 2007 Prelims · Q177

68. Male gametes in angiosperms are formed by the division of

- (A) generative cell
- (B) vegetative cell
- (C) microspore mother cell
- (D) microspore

AIPMT 2006 Prelims · Q101

69. What would be the number of chromosomes in the cells of the aleurone layer in a plant species with 8 chromosomes in its synergids ?

- (A) 16
- (B) 24
- (C) 32
- (D) 8

AIPMT 2006 Prelims · Q130

70. Long filamentous threads protruding at the end of a young cob of maize are :

- (A) anthers
- (B) styles
- (C) ovaries
- (D) hairs

71. The arrangement of the nuclei in a normal embryo sac in the dicot plants is :

- (A) 2 + 4 + 2
- (B) 3 + 2 + 3
- (C) 2 + 3 + 3
- (D) 3 + 3 + 2

72. In a cereal grain the single cotyledon of embryo is represented by :

- (A) coleorhiza
- (B) scutellum
- (C) prophyll
- (D) coleoptile

73. In a type of apomixis known as adventive embryony, embryos develop directly from the :

- (A) nucellus or integuments
- (B) synergids or antipodals in an embryo sac
- (C) accessory embryo sacs in the ovule
- (D) zygote

74. Through which cell of the embryo sac, does the pollen tube enter the embryo sac ?

- (A) Egg cell
- (B) Central cell
- (C) Persistent synergid
- (D) Degenerated synergid

75. Which one of the following represents an ovule, where the embryo sac becomes horse-shoe shaped and the funiculus and micropyle are close to each other ?

- (A) Circinotropous
- (B) Anatropous
- (C) Amphitropous
- (D) Atropous

76. Why is vivipary an undesirable character for annual crop plants ?

- (A) It reduces the vigour of plant
- (B) The seeds cannot be stored under normal conditions for the next season
- (C) The seeds exhibit long dormancy
- (D) It adversely affects the fertility of the plant

Answer key and explanations

1. Answer: (A) 8-nucleate and 7-celled

The mature embryo sac has 8 nuclei but only 7 cells: three antipodals, two synergids, one egg cell and one large central cell holding two polar nuclei. The two polar nuclei sharing one cell is why the cell count is one less than the nuclear count.

2. Answer: (A) Xenogamy

Xenogamy is transfer of pollen from the anther of one plant to the stigma of a different plant, so it brings genetically different pollen. Geitonogamy is transfer between flowers of the same plant and is genetically like self-pollination.

3. Answer: (D) Rosaceae ; Leguminosae

Pollen of some members of Rosaceae, Leguminosae and Solanaceae stays viable for months. In Poaceae such as rice and wheat pollen loses viability within about 30 minutes, so any pair containing Poaceae is wrong.

4. Answer: (A) insects or wind

In water hyacinth and water lily the flowers rise above the water surface and are pollinated by insects or wind, as in most land plants. Water pollination is limited to a few submerged genera such as Vallisneria, Hydrilla and Zostera.

5. Answer: (A) Hilum

The hilum is the point where the body of the ovule is fused with the funicle (stalk). The micropyle is the opening at the tip of the integuments, the chalaza is the base opposite the micropyle, and the nucellus is the tissue inside the integuments.

6. Answer: (D) Ovules develop into embryo sac

After fertilisation ovules develop into seeds; the embryo sac forms inside the ovule before fertilisation. The ovary becoming the fruit, the zygote the embryo and the central cell (primary endosperm nucleus) the endosperm are all correct.

7. Answer: (D) Parthenogenesis

Development of an embryo from the female gamete without fertilisation is parthenogenesis.

Parthenocarpy is development of a fruit without fertilisation, and syngamy is the fusion of gametes itself.

8. Answer: (B) Perisperm

Residual, persistent nucellus in seeds such as black pepper and beet is called perisperm. Tegmen is the inner seed coat and hilum is the scar where the seed was attached to the stalk.

9. Answer: (D) One fuses with the egg and other fuses with central cell nuclei.

In double fertilisation one male gamete fuses with the egg (syngamy) and the other fuses with the two polar nuclei of the central cell (triple fusion) to form the primary endosperm nucleus. Neither gamete fuses with a synergid nucleus.

10. Answer: (D) Syngamy and triple fusion

In angiosperms one male gamete fuses with the egg (syngamy) and the other fuses with the two polar nuclei (triple fusion); the two fusions together in one embryo sac are called double fertilization. Fusion of one male gamete with the polar nuclei is only triple fusion, one half of the process.

11. Answer: (B) Yucca

Yucca is pollinated only by the yucca moth, which lays its eggs in the ovary of the flower; the larvae feed on some developing seeds. The plant cannot set seed without the moth and the moth cannot complete its life cycle without the flower. Hydrilla is water-pollinated and Viola has cleistogamous flowers.

12. Answer: (A) -196°C

Liquid nitrogen boils at about -196°C , and pollen cryopreserved at this temperature stays viable for years, forming pollen banks used in crop breeding. The other temperatures are not the temperature of liquid nitrogen.

13. Answer: (D) Sporopollenin

The exine of pollen is made of sporopollenin, one of the most resistant organic materials, which withstands high temperature, strong acids and alkalis and is not degraded by enzymes, so pollen is well preserved as fossils. The intine is thin cellulose-pectin and pollenkit is a sticky oily coat; neither survives.

14. Answer: (B) Autogamy and geitonogamy

In a dioecious plant male and female flowers are on different plants, so pollen cannot reach a stigma of the same flower (autogamy) or of another flower on the same plant (geitonogamy). Xenogamy, pollination between different plants, is the only route left, so it is not prevented.

15. Answer: (C) Embryo sac

The single functional megaspore undergoes three free-nuclear mitotic divisions to form the 7-celled, 8-nucleate embryo sac (female gametophyte). The ovule is the structure that contains it, and endosperm and embryo form only after fertilisation.

16. Answer: (B) Entomophily

Insect-pollinated (entomophilous) flowers attract pollinators with colour, scent and nectar, and reward them with nectar and pollen. Wind and water pollination need no attractants, and cleistogamous flowers never open.

17. Answer: (C) Wind

Wind-pollinated flowers often have a single ovule in each ovary and many flowers packed into an inflorescence, as in corn cobs and grasses. Bee- and bat-pollinated flowers rely on showy flowers, scent and nectar instead.

18. Answer: (D) Angiosperms

Double fertilisation, syngamy plus triple fusion to form the triploid primary endosperm nucleus, is a unique feature of angiosperms. Gymnosperms have a haploid endosperm formed before fertilisation.

19. Answer: (B) $2n$; $2n$; n ; n ; $2n$; n ; $2n$; and $3n$

Nucellus and the megaspore mother cell are diploid; meiosis gives a haploid megaspore, whose products include the haploid egg and haploid polar nuclei; the zygote is $2n$, the fused secondary nucleus is $2n$, and its fusion with a male gamete gives the triploid primary endosperm nucleus.

Sequences that make the egg $2n$ or the PEN $2n$ are wrong.

20. Answer: (D) Coleoptile

In grass embryos the shoot apex and a few leaf primordia are enclosed in a hollow foliar sheath called the coleoptile. The coleorrhiza is the undifferentiated sheath around the radicle and root cap, while epicotyl and hypocotyl are portions of the embryonal axis.

21. Answer: (C) - 196°C

Liquid nitrogen boils at -196°C , and pollen grains are cryopreserved at this temperature in pollen banks for years. The other temperatures are not the temperature of liquid nitrogen.

22. Answer: (B) Inbreeding depression

Continued self-pollination increases homozygosity, exposing harmful recessive alleles and reducing fertility and vigour, which is inbreeding depression. Heterosis (hybrid vigour) is the opposite outcome produced by outcrossing.

23. Answer: (D) One male gamete is discharged into it during fertilization.

The pollen tube releases two male gametes into the synergid of the embryo sac: one fuses with the egg and the other with the polar nuclei (double fertilisation). The embryo sac is the female gametophyte inside the ovule, and it develops from a megaspore formed by meiosis.

24. Answer: (C) reduction division occurs in the megaspore mother cells

The diploid megaspore mother cell undergoes meiosis to form four haploid megaspores, so reduction division happens there. The filiform apparatus belongs to the synergids, the typical embryo sac has only three antipodal cells, and the central cell is the largest cell of the embryo sac.

25. Answer: (B) insects or wind

In water hyacinth and water lily the flowers rise above the water surface and are pollinated by insects or wind, as in most land plants. Water pollination is limited to plants like Vallisneria, Hydrilla and Zostera.

26. Answer: (A) megasporangium

The ovule is the megasporangium: its nucellus produces the megaspore mother cell, which forms megaspores. The carpel is the megasporophyll that bears the ovules, and the megaspore mother cell and megaspore are cells inside the ovule.

27. Answer: (D) Free nuclear endosperm

In coconut the primary endosperm nucleus divides repeatedly without wall formation, so the watery liquid of a tender coconut is free-nuclear endosperm; the surrounding white kernel is the later cellular endosperm. The endocarp is the hard shell and the mesocarp is the fibrous husk.

28. Answer: (D) Thalamus or petal

The filament's proximal (basal) end is attached to the thalamus, or to the petal in epipetalous flowers, while its distal end bears the anther. The connective joins the two anther lobes and the placenta bears ovules.

29. Answer: (A) Tapetum helps in the dehiscence of anther

The tapetum is the innermost anther wall layer that nourishes developing pollen grains; dehiscence is brought about by the endothecium and stomium. The exine is made of sporopollenin, pollen causes allergies, and cryopreserved pollen is used in breeding.

30. Answer: (D) scutellum

In monocot grains like maize the single large shield-shaped cotyledon is the scutellum. Coleoptile and coleorrhiza are sheaths covering the plumule and radicle respectively.

31. Answer: (D) Apomixis

Apomixis is the formation of seeds without fertilisation, a form of asexual reproduction that mimics sexual reproduction (e.g. some grasses and Asteraceae). Somatic hybridisation is fusion of protoplasts, and budding and sporulation are other asexual methods that do not produce seeds.

32. Answer: (A) Pollen grains of many species can germinate on the stigma of a flower, but only one pollen tube of the same species grows into the style.

The pistil accepts only compatible pollen; pollen of other species is usually rejected, and many compatible pollen tubes of the same species can grow down the style, not just one. The other statements, about pollen/nectar robbers, pollen-pistil chemical interaction and reptile pollinators, are from NCERT and correct.

33. Answer: (A) Honey is made by bees by digesting pollen collected from flowers

Bees make honey from the nectar they collect, not by digesting pollen, so that statement is false. Pollen is used as a nutritional supplement, causes allergies in some people, and flowers pollinated by flies and bats often give out foul odours.

34. Answer: (B) Geitonogamy

In geitonogamy pollen goes to another flower of the same plant, so a pollinating agent is needed, but the pollen and ovule are genetically the same, as in self-pollination. Xenogamy brings genetically different pollen, and cleistogamy needs no pollinator at all.

35. Answer: (C) Nectar and pollen grains

Nectar and pollen are the usual food rewards that flowers offer to animal pollinators. Colour, size and fragrance attract pollinators but are signals, not rewards.

36. Answer: (C) Solid style

A solid style is filled with transmitting tissue through which the pollen tube grows to the ovary. In a hollow style the tube grows along the canal, and the type of stigma does not decide this.

37. Answer: (C) Guide the entry of pollen tube

The filiform apparatus consists of finger-like wall thickenings at the micropylar tip of the synergids, and it guides the pollen tube into the synergid. Recognition of compatible pollen happens on the stigma, and nectar is produced by nectaries, not by the embryo sac.

38. Answer: (B) Supplementing food

Pollen grains are rich in nutrients, and pollen tablets and syrups are sold as food supplements. They are not sold for breeding programmes, conservation or in vitro fertilisation.

39. Answer: (D) fertilization of a flower by the pollen from another flower of the same plant

Geitonogamy is the transfer of pollen from one flower to the stigma of another flower of the same plant; it is functionally cross pollination but genetically like selfing. Pollination within the same flower is autogamy, and pollen from a different plant is xenogamy.

40. Answer: (B) Lilium

In angiosperms such as *Lilium* the male gametophyte is extremely reduced: a mature pollen grain has only a vegetative cell and a generative cell (or two male gametes), at most three cells. The male gametophyte of *Pinus* has more cells (prothallial cells as well), and in *Pteris* and *Funaria* it is a multicellular free-living or gametophytic body.

41. Answer: (D) Tapetum nourishes the developing pollen

The tapetum, the innermost wall layer of the microsporangium, nourishes the developing pollen grains. The hard outer pollen layer is the exine (intine is inner), sporogenous tissue is diploid, and microspores come from the sporogenous tissue, not the endothecium.

42. Answer: (C) New genetic combination leading to variation

Sexual reproduction involves meiosis and fusion of gametes from two parents, so the offspring carry new genetic combinations that produce variation. Seed viability, dormancy or biomass are not general outcomes of sexual reproduction.

43. Answer: (C) No dependence on pollinators

Cleistogamous flowers never open, so pollen falls directly on the stigma of the same flower and seed set is assured even without pollinators. Because this is self-pollination, it reduces rather than increases genetic variability.

44. Answer: (C) Being a diploid tissue

Perisperm is residual, persistent nucellus, a diploid maternal tissue, whereas endosperm is triploid, formed by fusion of a male gamete with the two polar nuclei. Perisperm does store food (e.g. black pepper), so it is not a tissue without reserves.

45. Answer: (C) Initiation of pollen tube

Germ pores are thin areas of the exine where sporopollenin is absent, and the pollen tube grows out through them. The male gametes leave only later, from the tip of the tube inside the synergid, and the radicle comes out of the seed, not the pollen.

46. Answer: (A) When pollen is shed at two-celled stage, double fertilization does not take place

Pollen shed at the two-celled stage still achieves double fertilisation, because the generative cell divides into two male gametes inside the pollen tube. The other statements are true: the vegetative cell is larger, some pollen (e.g. of Solanaceae) stays viable for months, and the intine is cellulose and pectin.

47. Answer: (D) Wind

Wind-pollinated flowers usually have a single ovule in each ovary and many flowers in an inflorescence. Insect- and bird-pollinated flowers often have many ovules, since one visit can deliver many pollen grains.

48. Answer: (C) Sporopollenin

Sporopollenin in the exine of pollen grains is one of the most resistant organic materials; it withstands high temperatures and strong acids and alkalis, and no known enzyme degrades it. Lignin and cellulose are both broken down by microbial enzymes.

49. Answer: (B) Papaya

Papaya is dioecious (male and female flowers on separate plants), so neither autogamy nor geitonogamy is possible. Maize, castor and cucumber are monoecious, which prevents autogamy but still allows geitonogamy.

50. Answer: (B) Commelina

Commelina produces cleistogamous flowers that never open and self-pollinate, so seed set is assured even without pollinators. Salvia needs insects, fig depends on fig wasps, and Zostera is water-pollinated.

51. Answer: (B) Endosperm

Coconut water is free-nuclear endosperm and the white edible kernel is cellular endosperm. The embryo is small, and the fibrous husk and hard shell are the mesocarp and endocarp.

52. Answer: (B) Both produce progeny identical to the parent

Neither vegetative reproduction nor apomixis involves meiosis and fusion of gametes, so both give progeny genetically identical to the parent. Apomixis forms seeds and so does not bypass flowering, and neither process is restricted to dicots.

53. Answer: (C) Embryo sac

In angiosperms the functional megaspore divides by three free-nuclear mitoses to form the embryo sac, the female gametophyte. The ovule is the structure that contains the megaspore, and endosperm forms only after fertilisation.

54. Answer: (B) Citrus

In many Citrus species, nucellar cells surrounding the embryo sac divide and grow into extra embryos, so seeds often contain several embryos. This is nucellar polyembryony, a form of apomixis.

55. Answer: (D) Synergid

The filiform apparatus is a set of finger-like wall thickenings at the micropylar tip of the synergids, which guides the pollen tube into the embryo sac. It is not found in the egg, zygote or suspensor.

56. Answer: (C) 63

Root tip cells are diploid, so $2n = 42$ and $n = 21$. The aleurone layer is the outer layer of the endosperm, which is triploid: $3n = 3 \times 21 = 63$. 42 is the diploid count and would be the trap.

57. Answer: (D) Grasses

Wind pollination is common in grasses, which have light non-sticky pollen, well-exposed stamens and large feathery stigmas. Orchids, legumes and lilies have showy flowers pollinated by insects.

58. Answer: (A) Cleistogamy

Cleistogamous flowers never open, so pollen from the anthers can only reach the stigma of the same flower: pollination is always autogamous. Geitonogamy and xenogamy involve transfer between flowers, and chasmogamous flowers are open and may be cross-pollinated.

59. Answer: (C) Maternal sporophytic tissue in ovule

In Citrus and mango, some nucellar cells around the embryo sac (maternal sporophytic tissue) divide and grow directly into embryos, a form of apomixis called adventive embryony. They do not come from a diploid egg, synergids or antipodals.

60. Answer: (C) Small, producing large number of dry pollen grains

Wind-pollinated flowers are small and inconspicuous and make large amounts of light, dry, non-sticky pollen, because most of it is lost in transit. They give no reward to animals, so they lack nectar and bright colours.

61. Answer: (C) Geitonogamy

Geitonogamy is pollination between different flowers of the same plant. It needs a pollinating agent, as cross-pollination does, but genetically it is the same as self-pollination. Autogamy is within the same flower, and xenogamy is between flowers of different plants.

62. Answer: (D) Pea

Pea seeds are non-albuminous: the endosperm is fully used up by the developing embryo, and food ends up stored in the cotyledons. Maize, coconut and castor seeds keep endosperm in the mature seed (albuminous seeds).

63. Answer: (D) Pollen exine

Pollen exine is made of sporopollenin, among the most resistant organic materials known, which no known enzyme can degrade; this is why pollen survives as fossils. Cuticle, cork and wood are eventually broken down by microbial enzymes.

64. Answer: (C) Egg cell and antipodal cells

The egg and the antipodal cells both belong to the haploid female gametophyte (embryo sac). The secondary nucleus is diploid (two polar nuclei fused), and the megaspore mother cell and nucellus are diploid sporophytic tissue.

65. Answer: (B) It helps in the entry of pollen tube into a synergid

The filiform apparatus, the finger-like wall ingrowths at the micropylar tip of the synergids, guides the pollen tube into a synergid. It does not lead the tube from the synergid to the egg; the male gametes are released inside the synergid.

66. Answer: (B) Autogamy, but not geitonogamy

A unisexual flower carries either anthers or stigma, so pollination within the same flower (autogamy) is impossible. In monoecious plants, pollen can still pass between male and female flowers of the same plant, so geitonogamy is not prevented; only dioecy blocks both.

67. Answer: (D) microspore mother cell

Before and during meiosis the microspore mother cell (and the tetrad it forms) lays down a temporary callose wall, which is later dissolved to release the microspores. A mature pollen grain is covered by sporopollenin exine and pectocellulosic intine, not callose.

68. Answer: (A) generative cell

The generative cell of the pollen grain divides mitotically to form the two male gametes. The vegetative cell forms the pollen tube, and the microspore mother cell divides by meiosis to form microspores.

69. Answer: (B) 24

Synergids are cells of the embryo sac and are haploid, so $n = 8$ here. The aleurone layer is the outermost layer of the endosperm, which is triploid ($3n$), giving 24 chromosomes. 16 would be the diploid ($2n$) count of somatic cells, not endosperm.

70. Answer: (B) styles

The silky threads (silk) of a maize cob are the long styles and stigmas of the female flowers, which catch wind-borne pollen. They are not hairs, and anthers are borne in the male tassel.

71. Answer: (B) 3 + 2 + 3

The mature embryo sac has 3 cells at the micropylar end (egg apparatus), 2 polar nuclei in the central cell and 3 antipodals at the chalazal end: 3 + 2 + 3. It is 7-celled and 8-nucleate.

72. Answer: (B) scutellum

In grass (cereal) embryos the single shield-shaped cotyledon is called the scutellum. The coleoptile and coleorhiza are sheaths covering the plumule and radicle.

73. Answer: (A) nucellus or integuments

In adventive embryony (seen in Citrus and mango), diploid nucellar or integument cells outside the embryo sac grow directly into embryos, with no gametophyte step. Embryos formed from synergids or antipodals are a different kind of apomixis, and an embryo from a zygote is normal sexual reproduction.

74. Answer: (D) Degenerated synergid

The pollen tube, guided by the filiform apparatus, enters one of the synergids, which degenerates and releases the male gametes. The other, persistent synergid is not entered, and the tube does not go directly into the egg or the central cell.

75. Answer: (C) Amphitropous

In an amphitropous ovule, both the body of the ovule and the embryo sac are curved into a horseshoe shape, which brings the micropyle close to the funiculus. An anatropous ovule is inverted but its embryo sac stays straight, and an atropous ovule is upright.

76. Answer: (B) The seeds cannot be stored under normal conditions for the next season

In vivipary, seeds germinate while still on the parent plant without any dormancy, so they cannot be dried and stored for sowing next season. That makes the trait undesirable for annual crops. Vivipary means no dormancy, the opposite of long dormancy.

Questions as set in the AIPMT/NEET papers conducted by CBSE and NTA. Answers checked and explanations written by the RankUp team. RankUp is not affiliated with CBSE or NTA.