Chapter 2

Sexual Reproduction in Flowering Plants

Solutions

SECTION - A

Objective Type Questions

(Flower - A Fascinating Organ of Angiosperms, Pre-fertilisation : Structures and Events)

1. Pollen grains are generally _____ in outline measuring _____ micrometers in diameter.

   (1) Spherical, 25-50 (2) Oblong, 25-50 (3) Oval, 10-25 (4) Spherical, 75-100

Sol. Answer (1)

Spherical 25 – 50 μm

2. The vegetative cell is

   (1) Small, has large irregularly shaped nucleus (2) Large, has large irregularly shaped nucleus

   (3) Large with spindle shaped nucleus (4) Small, spindle shaped nucleus

Sol. Answer (2)

Due to asymmetrical spindle formation.

3. Cryopreservation means storing of products in

   (1) Liquid nitrogen (2) Liquid oxygen (3) Liquid hydrogen (4) Liquid helium

Sol. Answer (1)

Liquid $N_2 \rightarrow$ at–196 °C

4. Choose the odd one w.r.t. gynoecium.

   (1) Gynoecium represents the female reproductive part of flower

   (2) The gynoecium may be syncarpous or apocarpous

   (3) The number of ovules in papaya and mango is one

   (4) The ovules are attached to placenta

Sol. Answer (3)

Papaya contain large number of ovule

5. The number of mitotic generations required to form a mature embryo sac in most of the flowering plants is

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

Sol. Answer (3)

Megaspore contain single nucleus which undergo 3 mitotic division.

6. The types of flowers which always produce seeds even in the absence of pollinators

(1) Chasmogamous flowers (2) Cleistogamous flowers

(3) Bisexual flowers (4) Unisexual flowers

Sol. Answer (2)

Cleistogamy take place in those flower which always remain closed.

7. The type of pollination which brings genetically different types of pollen on the stigma is

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

Sol. Answer (2)

Xenogamy take place in genetically different plants.

8. Feathery stigma and versatile anthers are characteristic of

(1) Wind pollinated flowers (2) Insect pollinated flowers

(3) Water pollinated flowers (4) Bat pollinated flowers

Sol. Answer (1)

Feathery stigma to catch anther from air.

9. Hydrophily is limited to 30 genera which are mostly

(1) Gymnosperms (2) Monocots

(3) Dicots (4) More than one option is correct

Sol. Answer (2)

10. Common floral reward provided by plants to pollinator are

(1) Nectar and pollen (2) Pollen and enzymes (3) Hormones and nectar (4) All of these

Sol. Answer (1)

11. Pollen pistil interaction is

(1) Chemically mediated process (2) Dynamic process

(3) Genetically controlled process (4) More than one option is correct

Sol. Answer (4)

Chemically mediated process as well genetically controlled process.

12. Emasculation

(1) Prevent self-pollination in female parent (2) Prevent cross pollination in female parent

(3) Prevent self-pollination in male parent (4) Prevent cross pollination in male parent

Sol. Answer (1)

Emasculation is removal of anthers from the flower in bud condition.

13. Mark the incorrect statement

(1) Outer three layers of anther wall are protective in function

(2) Sporogenous tissue, occupies the centre of each microsporangium

(3) Cells of tapetum and endothecium show increase in DNA contents by endomitosis and polyteny

(4) Ploidy level of microspore tetrad is haploid

Sol. Answer (3)

Cells of endothecium will not show increase in DNA content.

14. Which of the following statement is applicable for all flowering plants?

(1) Monosiphonous pollen tube

(2) Non-motile and morphologically dissimilar gametes

(3) Presence of pollinium

(4) Division of generative cell after pollination

Sol. Answer (2)

Pollen tube will carry the gametes.

15. Which is **incorrect** statement?

I. Each cell of sporogenous tissue in anther is capable of giving rise to microspore tetrad.

II. The pollen grain represent male gametophyte.

III. Pollen grains are usually triangular and 10-15 μm in diameter.

IV. Sporopollenin is one of the most resistance organic material which can be destroyed only by strong acids and alkali.

(1) I, II are incorrect but III, IV are correct

(2) III, IV are incorrect but I, II are correct

(3) I, III are incorrect but II, IV are correct

(4) II, IV are correct but I, III are incorrect

Sol. Answer (2)

Pollens are spherical and average size is 25-50 μm.

Sporopollenin donot get destroyed by any known chemical.

16. Which statement is **incorrect**?

(1) Intine is the inner wall of pollen grain and exhibit fascinating array of patterns and designs

(2) The mature pollen grains has two cells, the bigger is vegetative cell and the smaller is generative cell which floats in cytoplasm of vegetative cell

(3) Carrot grass pollens cause pollen allergy

(4) Pollen grains of pea and rose maintain viability for months

Sol. Answer (1)

Intine is inner wall of pollen grain.

Exine exhibit fascinating pattern.

17. In papaya male and female flowers are present on different plants. It permits

(1) Autogamy

(2) Geitonogamy

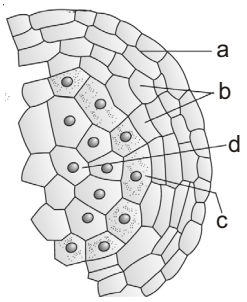
(3) Both autogamy and geitonogamy

(4) Xenogamy

Sol. Answer (4)

Papaya exhibit unisexuality.

18. Examine the figure given below and select the right option giving all the four parts a, b, c and d. **Correctly** identify



	a	b	c	d
(1)	Endothecium	Tapetum	Microspore mother cell	Middle layers
(2)	Tapetum	Endothecium	Microspore mother cell	Middle layers
(3)	Endothecium	Middle layer	Tapetum	Microspore mother cell
(4)	Endothecium	Microspore mother cell	Middle layer	Tapetum

Sol. Answer (3)

19. Select **incorrect** statement regarding microsporogenesis in an anther

(1) Large number of microspore mother cells differentiate in one pollen sac

(2) Each microsporogenesis involves one meiosis and two mitosis

(3) Microspore tetrads may be tetrahedral or isobilateral

(4) It consumes tapetum and middle layers

Sol. Answer (2)

Microsporogenesis involve only formation of microspores by meiosis.

20. In castor, proliferation of the outer integumentary cells at micropylar region

(1) Lacks hygroscopic ability

(2) Attract ants and helps in myrmecophily

(3) Is called epiblast

(4) Stores sugary substances

Sol. Answer (4)

21. An angiospermic plant is having 24 chromosomes in its leaf cells. The number of chromosomes present in synergid, pollen grain, nucellus & endosperm will be respectively

(1) 12, 12, 12, 72

(2) 8, 8, 12, 36

(3) 12, 12, 24, 36

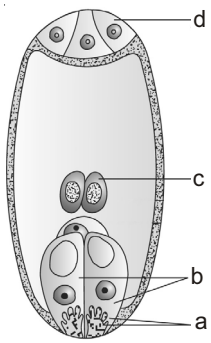
(4) 12, 12, 12, 36

Sol. Answer (3)

Synergid, Pollen $\rightarrow$ n

Nucellus $\rightarrow$ 2n, Endosperm $\rightarrow$ 3n

22. Examine the figure given below and select the right option giving all the four parts a, b, c and d. **Correctly** identify



	a	b	c	d
(1)	Synergids	Antipodal cells	Polar nuclei	Filiform apparatus
(2)	Filiform apparatus	Egg	Polar nuclei	Nucellus
(3)	Filiform apparatus	Synergids	Polar nuclei	Antipodal cell
(4)	Synergids	Polar nuclei	Filiform apparatus	Antipodal cell

Sol. Answer (3)

23. The devices to discourage self pollination are

(1) Pollen release and stigma receptivity is not synchronised

(2) Anther and stigma are placed at different position

(3) Rejection of pollen by stigma of the same flowers

(4) All of these

Sol. Answer (4)

24. In monoecious plant like castor and maize

(1) Autogamy and allogamy are not prevented

(2) Geitonogamy is prevented

(3) Autogamy is not prevented

(4) Geitonogamy is not prevented

Sol. Answer (4)

In castor and maize unisexual ♂ and ♀ flower are present on the same plant.

25. Select **incorrect** statement (w.r.t. artificial hybridisation)

(1) Emasculation is removal of anther in their mature condition from bisexual flower

(2) Emasculation is not required in male sterile plants

(3) Unisexual female flower is bagged in bud condition to prevent contamination

(4) Emasculated flowers are bagged in bud condition

Sol. Answer (1)

Removal of anther before maturation from bisexual flowers.

(Double Fertilisation, Post-fertilisation : Structures and Events, Apomixis and Polyembryony)

26. The cylindrical portion below the level of cotyledons on embryonal axis is

(1) Epicotyl (2) Hypocotyl (3) Radicle (4) Plumule

Sol. Answer (2)

27. Suitable environmental conditions for seed germination are

(1) Adequate moisture, light, anaerobic conditions

(2) Adequate moisture, low temperature, light

(3) Adequate moisture, suitable temperature and oxygen

(4) Light, water, absence of oxygen

Sol. Answer (3)

Adequatic moisture and temperature O_2 is needed for germination

28. Pericarp is dry in

(1) Guava, mango, mustard

(2) Mango, groundnut, orange

(3) Groundnut, mustard

(4) Orange, guava, mango

Sol. Answer (3)

They are simple and dry fruits.

29. Pick out **wrong** statement.

(1) Double fertilization is unique to angiosperms

(2) *Sequoia*, a gymnosperm, is one of the tallest tree

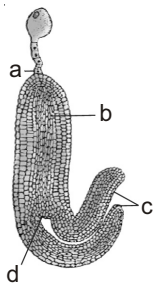
(3) Exine has apertures where sporopollenin is present

(4) Exine of pollen grains is made up of sporopollenin

Sol. Answer (3)

Exine is outer covering of pollen.

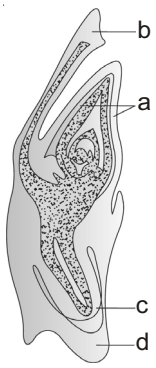
30. Examine the figure given below and select the right option giving all the four parts a, b, c and d. **Correctly** identify



	a	b	c	d
(1)	Suspensor	Radicle	Cotyledons	Plumule
(2)	Plumule	Cotyledons	Radicle	Suspensor
(3)	Suspensor	Plumule	Radicle	Cotyledon
(4)	Radicle	Plumule	Cotyledons	Suspensor

Sol. Answer (1)

31. Examine the figure given below and select the right option giving all the four parts a, b, c and d. **Correctly** identify.



	a	b	c	d
(1)	Coleoptile	Scutellum	Radicle	Coleorrhiza
(2)	Coleorrhiza	Radicle	Scutellum	Coleoptile
(3)	Scutellum	Coleorrhiza	Radicle	Coleoptile
(4)	Radicle	Scutellum	Coleoptile	Coleorrhiza

Sol. Answer (1)

32. Choose the **correct** option from the following

I. Dehydration and dormancy of mature seed are crucial for seed storage.

II. Seed of *Lupinus arcticus* is the oldest one which germinated after 2000 year.

III. Orchid seed is one of largest seed in plant Kingdom.

IV. Seeds of parasitic plants *Orobanche* and *Striga* are tiny seeds.

(1) I, II are correct but III, IV are incorrect

(2) I, IV are correct but II, III are incorrect

(3) III, IV are correct but I, II are incorrect

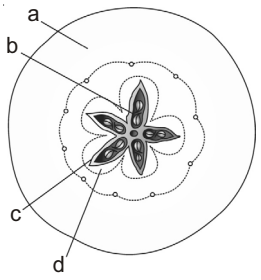
(4) II, III are correct but I, IV are incorrect

Sol. Answer (2)

Orchids are smallest seed.

Date palm have seed with highest utability.

33. Examine the figure given below and select the right option giving all the four parts a, b, c and d. **Correctly** identify.



	a	b	c	d
(1)	Thalamus	Seed	Endocarp	Mesocarp
(2)	Thalamus	Seed	Mesocarp	Endocarp
(3)	Mesocarp	Seed	Endocarp	Thalamus
(4)	Endocarp	Seed	Thalamus	Mesocarp

Sol. Answer (1)

34. Select the **correct** statement from the following :

(1) Hanging drop method as *in-vivo* germination of pollen grain

(2) Obturator directs the growth of pollen tube towards micropyle of seed

(3) There are many embryos of different sizes and shapes in the seeds of orange

(4) Embryo arises parthenogenetically from the diploid egg in adventive embryony

Sol. Answer (3)

35. Choose the **correct** option from the following statements.

I. Apomixis is form of asexual reproduction which mimics sexual reproduction.

II. In Apomixis seeds develop either from diploid egg cell or from cells of nucellus.

III. Seeds collected from hybrids plant maintain hybrid character for a longer times.

IV. In Apomixis, there is segregation of characters.

(1) All are correct

(2) All are incorrect

(3) Only I and II are correct

(4) Only II and IV are correct

Sol. Answer (3)

In hybrid seed, inbreeding depression take place. There is no segregation of characters.

SECTION - B

Previous Years Questions

1. Double fertilization is **[NEET-2018]**

(1) Fusion of two male gametes of a pollen tube with two different eggs

(2) Fusion of one male gamete with two polar nuclei

(3) Syngamy and triple fusion

(4) Fusion of two male gametes with one egg

Sol. Answer (3)

Double fertilization is a unique phenomenon that occur in angiosperms only.

Syngamy + Triple fusion = Double fertilization

2. Pollen grains can be stored for several years in liquid nitrogen having a temperature of **[NEET-2018]**

(1) –120°C (2) –80°C (3) –160°C (4) –196°C

Sol. Answer (4)

Pollen grains can be stored for several years in liquid nitrogen at –196°C (Cryopreservation)

3. Which of the following has proved helpful in preserving pollen as fossils? **[NEET-2018]**

(1) Pollenkitt

(2) Cellulosic intine

(3) Sporopollenin

(4) Oil content

Sol. Answer (3)

Sporopollenin cannot be degraded by enzyme; strong acids and alkali, therefore it is helpful in preserving pollen as fossil.

Pollenkitt – Help in insect pollination.

Cellulosic Intine – Inner sporoderm layer of pollen grain known as intine made up cellulose & pectin.

Oil content – No role is pollen preservation.

4. A dioecious flowering plant prevents both **[NEET-2017]**

(1) Autogamy and xenogamy (2) Autogamy and geitonogamy

(3) Geitonogamy and xenogamy (4) Cleistogamy and xenogamy

Sol. Answer (2)

When unisexual male and female flowers are present on different plants the condition is called dioecious and it prevents both autogamy and geitonogamy.

5. Functional megaspore in an angiosperm develops into **[NEET-2017]**

(1) Ovule (2) Endosperm (3) Embryo sac (4) Embryo

Sol. Answer (3)

Megaspore is the first cell of female gametophytic generation in angiosperm. It undergoes three successive generations of free nuclear mitosis to form 8-nucleated and 7-celled embryo sac.

6. Attractants and rewards are required for **[NEET-2017]**

(1) Anemophily (2) Entomophily (3) Hydrophily (4) Cleistogamy

Sol. Answer (2)

Insect pollinated plants provide rewards as edible pollen grain and nectar as usual rewards. While some plants also provide safe place for deposition of eggs.

7. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by **[NEET-2017]**

(1) Water (2) Bee (3) Wind (4) Bat

Sol. Answer (3)

Wind pollination or anemophily is favoured by flowers having a single ovule in each ovary, and numerous flowers packed in an inflorescence. Wind pollination is a non-directional pollination.

8. Double fertilization is exhibited by **[NEET-2017]**

(1) Gymnosperms (2) Algae (3) Fungi (4) Angiosperms

Sol. Answer (4)

Double fertilization is a characteristic feature exhibited by angiosperms. It involves syngamy and triple fusion.

9. In majority of angiosperms **[NEET(Phase-2)-2016]**

(1) Egg has a filiform apparatus

(2) There are numerous antipodal cells

(3) Reduction division occurs in the megaspore mother cells

(4) A small central cell is present in the embryo sac

Sol. Answer (3)

Megaspore Mother Cell (MMC) undergoes meiosis to form megaspore.

10. Pollination in water hyacinth and water lily is brought about by the agency of **[NEET(Phase-2)-2016]**

(1) Water (2) Insects or wind

(3) Birds (4) Bats

Sol. Answer (2)

Water hyacinth and water lily are aquatic plants pollinated by insect or wind.

11. The ovule of an angiosperm is technically equivalent to **[NEET(Phase-2)-2016]**

(1) Megasporangium (2) Megasporophyll

(3) Megaspore mother cell (4) Megaspore

Sol. Answer (1)

Integumented and stalked megasporangium is called ovule.

12. Which one of the following statements is **not** true? **[NEET-2016]**

(1) Stored pollen in liquid nitrogen can be used in the crop breeding programmes

(2) Tapetum helps in the dehiscence of anther

(3) Exine of pollen grains is made up of sporopollenin

(4) Pollen grains of many species cause severe allergies

Sol. Answer (2)

Tapetum provides nourishment to developing pollen grain.

13. Proximal end of the filament of stamen is attached to the **[NEET-2016]**

(1) Thalamus or petal (2) Anther (3) Connective (4) Placenta

Sol. Answer (1)

A typical stamen consist of anther and filament.

The proximal end of filament is attached to thalamus or petal of the flower where as distal and bears anther.

14. The coconut water from tender coconut represents **[NEET-2016]**

(1) Free nuclear endosperm (2) Endocarp

(3) Fleshy mesocarp (4) Free nuclear proembryo

Sol. Answer (1)

Coconut milk represents free nuclear endosperm where the division of PEN is not followed by cytokinesis.

15. Which of the following statements is **not correct**? **[NEET-2016]**

(1) Some reptiles have also been reported as pollinators in some plant species

(2) 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

(3) Insects that consume pollen or nectar without bringing about pollination are called pollen/nectar robbers

(4) Pollen germination and pollen tube growth are regulated by chemical components of pollen interacting with those of the pistil

Sol. Answer (2)

Pollen grains of different species are incompatible, so they fail to germinate.

16. Seed formation without fertilization in flowering plants involves the process of **(NEET-2016)**

(1) Apomixis (2) Sporulation

(3) Budding (4) Somatic hybridization

Sol. Answer (1)

Apomixis is a special mechanism to produce seeds without fertilisation.

17. Male gametophyte in angiosperms produces **[Re-AIPMT-2015]**

(1) Three sperms (2) Two sperms and a vegetative cell

(3) Single sperm and a vegetative cell (4) Single sperm and two vegetative cells

Sol. Answer (2)

In angiosperms, pollen grain is first male gametophyte. Pollen grain divides into generative cell and vegetative cell. Generative cell further divides into two sperms.

18. Coconut water from a tender coconut is: **[Re-AIPMT-2015]**

(1) Degenerated nucellus (2) Immature embryo

(3) Free nuclear endosperm (4) Innermost layers of the seed coat

Sol. Answer (3)

Coconut water is free nuclear endosperm.

19. Filiform apparatus is characteristic feature of : **[Re-AIPMT-2015]**

(1) Synergids (2) Generative cell (3) Nucellar embryo (4) Aleurone cell

Sol. Answer (1)

Filiform apparatus is finger like projections in each synergid.

20. The wheat grain has an embryo with one large shield-shaped cotyledon known as: **[Re-AIPMT-2015]**

(1) Coleoptile (2) Epiblast (3) Coleorrhiza (4) Scutellum

Sol. Answer (4)

Scutellum is the large persistent cotyledon in embryo of wheat grain.

21. Which one of the following fruits is parthenocarpic? **[Re-AIPMT-2015]**

(1) Banana (2) Brinjal (3) Apple (4) Jackfruit

Sol. Answer (1)

Formation of fruit without fertilisation is called parthenocarpy.

Banana is a parthenocarpic fruit therefore seedless.

22. In angiosperms, microsporogenesis and megasporogenesis **[Re-AIPMT-2015]**

(1) Occur in ovule (2) Occur in anther

(3) Form gametes without further divisions (4) Involve meiosis

Sol. Answer (4)

In angiosperms, microsporogenesis and megasporogenesis involve meiosis.

23. Which one of the following statements is **not** true? **[AIPMT-2015]**

(1) Honey is made by bees by digesting pollen collected from flowers

(2) Pollen grains are rich in nutrients, and they are used in the form of tablets and syrups

(3) Pollen grains of some plants cause severe allergies and bronchial afflictions in some people

(4) The flowers pollinated by flies and bats secrete foul odour to attract them

Sol. Answer (1)

Honey is made by using nectar of flowering plants.

24. The hilum is a scar on the **[AIPMT-2015]**

(1) Seed, where micropyle was present (2) Seed, where funicle was attached

(3) Fruit, where it was attached to pedicel (4) Fruit, where style was present

Sol. Answer (2)

The hilum is a scar on the seed coat through which the developing seeds were attached to the fruit.

25. Which one of the following may require pollinators, but is genetically similar to autogamy? **[AIPMT-2015]**

(1) Cleistogamy (2) Geitonogamy (3) Xenogamy (4) Apogamy

Sol. Answer (2)

Geitonogamy is genetically similar to autogamy since the pollen grains comes from the same plant.

26. Which of the following are the important floral rewards to the animal pollinators? **[AIPMT-2015]**

(1) Protein pellicle and stigmatic exudates (2) Colour and large size of flower

(3) Nectar and pollen grains (4) Floral fragrance and calcium crystals

Sol. Answer (3)

Nectar and pollen grains are the usual floral rewards.

27. Transmission tissue is characteristic feature of **[AIPMT-2015]**

(1) Wet stigma (2) Hollow style (3) Solid style (4) Dry stigma

Sol. Answer (3)

A solid style has transmission tissue with large intercellular spaces which allows growth of pollen tube.

28. Geitonogamy involves **[AIPMT-2014]**

(1) Fertilization of a flower by the pollen from another flower of the same plant

(2) Fertilization of a flower by the pollen from the same flower

(3) Fertilization of a flower by the pollen from a flower of another plant in the same population

(4) Fertilization of a flower by the pollen from a flower of another plant belonging to a distant population

Sol. Answer (1)

Geitonogamy is transfer of pollen grains from the anther to the stigma of another flower of the same plant.

29. Pollen tablets are available in the market for **[AIPMT-2014]**

(1) In vitro fertilization (2) Breeding Equisetum (3) Supplementing food (4) Ex situ conservation

Sol. Answer (3)

Pollen grains are rich in nutrients and it has become a fashion in recent years to use pollen tablets as food supplements.

30. Function of filiform apparatus is to **[AIPMT-2014]**

(1) Recognize the suitable pollen at stigma (2) Stimulate division of generative cell

(3) Produce nectar (4) Guide the entry of pollen tube

Sol. Answer (4)

Filiform apparatus, present in synergids, play an important role in guiding the pollen tube into the synergid.

31. Perisperm differs from endosperm in **[NEET-2013]**

(1) Having no reserve food

(2) Being a diploid tissue

(3) Its formation by fusion of secondary nucleus with several sperms

(4) Being a haploid tissue

Sol. Answer (2)

Nucellus remnant is called – Perisperm (2n)

32. Megasporangium is equivalent to **[NEET-2013]**

(1) Fruit (2) Nucellus (3) Ovule (4) Embryo sac

Sol. Answer (3)

33. Advantage of cleistogamy is **[NEET-2013]**

(1) More vigorous offspring (2) No dependence on pollinators

(3) Vivipary (4) Higher genetic variability

Sol. Answer (2)

Cleistogamy take place in closed flowers.

34. Which one of the following statements is **correct** ? **[NEET-2013]**

(1) Sporogenous tissue is haploid
(2) Endothecium produces the microspores
(3) Tapetum nourishes the developing pollen
(4) Hard outer layer of pollen is called intine

Sol. Answer (3)

Tapetum secrete ubish bodies, IAA for MMC.

35. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is **[AIPMT (Prelims)-2012]**

(1) Lignin (2) Cellulose (3) Cuticle (4) Sporopollenin

Sol. Answer (4)

36. The coconut water and the edible part of coconut are equivalent to **[AIPMT (Prelims)-2012]**

(1) Mesocarp (2) Embryo (3) Endosperm (4) Endocarp

Sol. Answer (3)

Coconut liquid endosperm.

37. The gynoecium consists of many free pistils in flowers of **[AIPMT (Prelims)-2012]**

(1) *Papaver* (2) *Michelia* (3) *Aloe* (4) Tomato

Sol. Answer (2)

Michelia – Apocarpous condition

38. Both, autogamy and geitonogamy are prevented in **[AIPMT (Prelims)-2012]**

(1) Castor (2) Maize (3) Papaya (4) Cucumber

Sol. Answer (3)

Papaya is unisexual plant so no autogamy and geitonogamy. Only xenogamy take place.

39. Even in absence of pollination agents seed-setting is assured in **[AIPMT (Prelims)-2012]**

(1) *Salvia* (2) Fig (3) *Commellina* (4) *Zostera*

Sol. Answer (3)

Cleistogamy take place.

40. What is the function of germ pore? **[AIPMT (Mains)-2012]**

(1) Emergence of radicle
(2) Absorption of water for seed germination
(3) Initiation of pollen tube
(4) Release of male gametes

Sol. Answer (3)

Pollen tube will come out.

41. Which one of the following statements is **wrong**? **[AIPMT (Mains)-2012]**

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

Sol. Answer (1)

60% of Angiosperm pollen is liberated at 2 celled stage and after this double fertilization will take place.

42. Plants with ovaries having only one or a few ovules, are generally pollinated by **[AIPMT (Mains)-2012]**

(1) Bees (2) Butterflies (3) Birds (4) Wind

Sol. Answer (4)

43. Nucellar polyembryony is reported in species of **[AIPMT (Prelims)-2011]**

(1) *Brassica* (2) *Citrus* (3) *Gossypium* (4) *Triticum*

Sol. Answer (2)

44. Filiform apparatus is a characteristic feature of : **[AIPMT (Prelims)-2011]**

(1) Zygote (2) Suspensor (3) Egg (4) Synergid

Sol. Answer (4)

It will absorb nutrition from outer nucellus.

45. Wind pollination is common in : **[AIPMT (Prelims)-2011]**

(1) Orchids (2) Legumes (3) Lilies (4) Grasses

Sol. Answer (4)

46. In which one of the following pollination is autogamous? **[AIPMT (Prelims)-2011]**

(1) Cleistogamy (2) Geitonogamy (3) Xenogamy (4) Chasmogamy

Sol. Answer (1)

No pollinating agent is required.

47. In angiosperms, functional megaspore develops into **[AIPMT (Mains)-2011]**

(1) Endosperm (2) Pollen sac (3) Embryo sac (4) Ovule

Sol. Answer (3)

Megaspore $\longrightarrow$ Embryosac [7-Celled, 8 - Nucleated]

48. What is common between vegetative reproduction and Apomixis? **[AIPMT (Mains)-2011]**

(1) Both occur round the year

(2) Both produces progeny identical to the parent

(3) Both are applicable to only dicot plants

(4) Both bypass the flowering phase

Sol. Answer (2)

Both are uniparental.

49. What would be the number of chromosomes of the aleurone cells of a plant with 42 chromosomes in its root tip cells? **[AIPMT (Prelims)-2011]**

(1) 21 (2) 42 (3) 63 (4) 84

Sol. Answer (3)

$2n \rightarrow 42$

$3n \rightarrow 63$

50. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called **[AIPMT (Prelims)-2010]**

(1) Autogamy (2) Xenogamy (3) Geitonogamy (4) Karyogamy

Sol. Answer (3)

51. Wind pollinated flowers are **[AIPMT (Prelims)-2010]**

(1) Small, producing nectar and dry pollen

(2) Small, brightly coloured, producing large number of pollen grains

(3) Small, producing large number of dry pollen grains

(4) Large, producing abundant nectar and pollen

Sol. Answer (3)

Small and light in weight so that it can be easily carried by.

52. Apomictic embryos in *Citrus* arise from **[AIPMT (Prelims)-2010]**

(1) Diploid egg (2) Synergids

(3) Maternal sporophytic tissue in ovule (4) Antipodal cells

Sol. Answer (3)

Embryo produce without fertilization.

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

[AIPMT (Prelims)-2008]

(1) Egg nucleus and secondary nucleus (2) Megaspore mother cell and antipodal cells

(3) Egg cell and antipodal cells (4) Nucellus and antipodal cells

Sol. Answer (3)

54. What does the filiform apparatus do at the entrance into ovule? **[AIPMT (Prelims)-2008]**

(1) It guides pollen tube from a synergid to egg

(2) It helps in the entry of pollen tube into a synergid

(3) It prevents entry of more than one pollen tube into the embryosac

(4) It brings about opening of the pollen tube

Sol. Answer (2)

It help in entry of pollen tube in Oosphere.

55. Unisexuality of flowers prevents **[AIPMT (Prelims)-2008]**

(1) Autogamy and geitonogamy (2) Autogamy, but not geitonogamy

(3) Both geitonogamy and xenogamy (4) Geitonogamy, but not xenogamy

Sol. Answer (2)

Autogamy – Pollination between ♂ and ♀ of the same flower.

Geitonogamy – Pollination between ♂ and ♀ different of the flower of same plant.

56. Which one of the following is resistant to enzyme action? **[AIPMT (Prelims)-2008]**

(1) Leaf cuticle (2) Cork (3) Wood fibre (4) Pollen exine

Sol. Answer (4)

Contain sporopolenin

57. Male gametes in angiosperms are formed by the division of **[AIPMT (Prelims)-2007]**

(1) Microspore mother cell (2) Microspore

(3) Generative cell (4) Vegetative cell

Sol. Answer (3)

Generative cell undergo mitosis make ♂ gamete.

58. Which one of the following is surrounded by a callose wall? **[AIPMT (Prelims)-2007]**

(1) Pollen grain (2) Microspore mother cell (3) Male gamete (4) Egg

Sol. Answer (2)

Generative cell undergo ergo mitosis to make ♂ gamete.

59. What would be the number of chromosomes in the cells of the aleurone layer in a plant species with 8 chromosomes in its synergids? **[AIPMT (Prelims)-2006]**

(1) 16 (2) 24 (3) 32 (4) 8

Sol. Answer (2)

n = 8 $\rightarrow$ Synergids so Alurone layer 3n = 24

60. Long filamentous threads protruding at the end of a young cob of maize are **[AIPMT (Prelims)-2006]**

(1) Anthers (2) Styles (3) Ovaries (4) Hairs

Sol. Answer (2)

61. The arrangement of the nuclei in a normal embryo sac in the dicot plants is **[AIPMT (Prelims)-2006]**

(1) 2 + 4 + 2 (2) 3 + 2 + 3 (3) 2 + 3 + 3 (4) 3 + 3 + 2

Sol. Answer (2)

3 + 2 + 3 $\rightarrow$ Nucleus of antipodals

↓ ↘

Egg Apparatus Polar nuclei

62. In a cereal grain the single cotyledon of embryo is represented by **[AIPMT (Prelims)-2006]**

(1) Coleorhiza (2) Scutellum (3) Prophyll (4) Coleoptile

Sol. Answer (2)

63. In a type of apomixis known as adventive embryony, embryos develop directly from the **[AIPMT (Prelims)-2005]**

(1) Nucellus or integuments (2) Synergids or antipodals in an embryo sac

(3) Accessory embryo sacs in the ovule (4) Zygote

Sol. Answer (1)

64. Through which cell of the embryo sac, does the pollen tube enter the embryo sac? **[AIPMT (Prelims)-2005]**

(1) Egg cell (2) Central cell

(3) Persistant synergid (4) Degenerated synergid

Sol. Answer (4)

65. 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? **[AIPMT (Prelims)-2005]**

(1) Circinotropous (2) Anatropous (3) Amphitropous (4) Atropous

Sol. Answer (3)

Embryosac is horse shoe-shape and ovule body bend.

Questions asked Prior to Medical Ent. Exams. 2005

66. Which one of the following statements is **correct**?

(1) Geitonogamy involves the pollen and stigma of flowers of different plants

(2) Cleistogamous flowers are always autogamous

(3) Xenogamy occurs only by wind pollination

(4) Chasmogamous flowers do not open at all

Sol. Answer (2)

Because they are always closed flowers.

67. Megaspores are produced from the megaspore mother cells after

(1) Meiotic division (2) Mitotic division (3) Formation of a thick wall (4) Differentiation

Sol. Answer (1)

Megaspores are produced by Mega sporogenesis.

68. Animal vectors are required for pollination in

(1) Maize (2) *Vallisneria* (3) Mulbery (4) Cucumber

Sol. Answer (4)

Colourful flowers.

69. Which of the following statements is **correct?**

(1) Sporopollenin can withstand high temperatures but not strong acids

(2) Sporopollenin can be degraded by enzymes

(3) Sporopollenin is made up of inorganic materials

(4) Sporopollenin can withstand high temperatures as well as strong acids and alkalis

Sol. Answer (4)

70. Albuminous seeds store their reserve food mainly in

(1) Perisperm (2) Endosperm (3) Cotyledons (4) Hypocotyl

Sol. Answer (2)

71. Embryo in sunflower has

(1) Two cotyledons (2) Many cotyledons (3) No cotyledon (4) One cotyledon

Sol. Answer (1)

Sunflower is dicot

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

(1) Maize (2) Coconut (3) Castor (4) Pea

Sol. Answer (4)

Pea is non-endospermic.

73. In a flowering plant, the pollen tube first arrives in

(1) Egg (2) An antipodal cell (3) A synergid (4) Central cell

Sol. Answer (3)

74. Which of the following statements is wrong?

(1) Pollen grains remain viable for several months because their outer covering is made of sporopollenin

(2) No enzyme can degrade sporopollenin

(3) Pollen grains are well represented in fossil strata due to sporopollenin

(4) Pollen wall has cavities containing proteins

Sol. Answer (1)

Pollen viability depends upon temperature, humidity and genetical make up.

75. Long, ribbon-like pollen grains are seen in some

(1) Aquatic plants (2) Wind-pollinated grasses

(3) Gymnosperms (4) Bird-pollinated flowers

Sol. Answer (1)

Zostera

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

(1) Egg nucleus and secondary nucleus (2) Megaspore mother cell and antipodal cells

(3) Egg cell and antipodal cells (4) Nucellus and antipodal cells

Sol. Answer (3)

77. Embryo sac represents

(1) Megaspore (2) Megagametophyte

(3) Megasporophyll (4) Megagamete

Sol. Answer (2)

78. If an angiospermic male plant is diploid and female plant tetraploid, the ploidy level of endosperm will be

(1) Tetraploid (2) Pentaploid (3) Haploid (4) Triploid

Sol. Answer (2)

♂ - 2n, ♀ - 4n

Gamete ♂ = n, ♀ = 2n

So zygote will be 3n

79. The role of double fertilization in angiosperms is to produce

(1) Cotyledons (2) Endocarp (3) Endosperm (4) Integuments

Sol. Answer (3)

Triple fusion = 3n Endosperm

80. An interesting modification of flower shape for insect pollination occurs in some orchids in which a male insect mistakes the pattern on the orchid flower for the female species and tries to copulate with it, thereby pollinating the flower. This phenomenon is called

(1) Pseudo-pollination (2) Pseudo-parthenocarpy (3) Mimicry (4) Pseudo-copulation

Sol. Answer (4)

Oprys Orchid flower appear like ♀ insect of *Colpa.*

81. Endosperm is formed during the double fertilization by

(1) Two polar nuclei and one male gamete (2) One polar nuclei and one male gamete

(3) Ovum and male gamete (4) Two polar nuclei and two male gametes

Sol. Answer (1)

Triple fusion – 2 Polar nuclei of ♀ and 1 male nucleus.

82. Anemophily type of pollination is found in

(1) *Salvia* (2) Bottle brush (3) *Vallisneria* (4) Coconut

Sol. Answer (4)

Wind pollination

83. What is the direction of micropyle in anatropous ovule?

(1) Upward (2) Downward (3) Right (4) Left

Sol. Answer (2)

84. In angiosperm, all the four microspores of tetrad are covered by a layer which is formed by

(1) Pectocellulose (2) Callose (3) Cellulose (4) Sporopollenin

Sol. Answer (2)

Callose $\rightarrow$ b, 1, 3 Glucan

85. In angiosperms, pollen tube liberate their male gametes into the

(1) Central cell (2) Antipodal cells (3) Egg cell (4) Synergids

Sol. Answer (4)

86. An ovule which becomes curved so that the nucellus and embryo sac lie at right angle to the funicle, is

(1) Hemitropous (2) Campylotropous (3) Anatropous (4) Orthotropous

Sol. Answer (1)

87. When a diploid female plant is crossed with a tetraploid male, the ploidy of endosperm cells in the resulting seed is

(1) Tetraploidy (2) Pentaploidy (3) Diploidy (4) Triploidy

Sol. Answer (1)

$\female$ - 2n, $\male$ - 4n,

$$\text{Ploidy of endosperm} = \frac{1}{2} \text{ ploidy of } \male \text{ ploidy of } \female$$

$$= \quad 2n \quad + \quad 2n \quad = \quad 4n$$

88. The polyembryony commonly occurs in

(1) Tomato (2) Potato (3) *Citrus* (4) Turmeric

Sol. Answer (3)

89. Eight nucleated embryosac is

(1) Only monosporic (2) Only bisporic (3) Only tetrasporic (4) Any of these

Sol. Answer (4)

90. Adventive embryony in *Citrus* is due to

(1) Nucellus (2) Integuments (3) Zygotic embryo (4) Fertilized egg

Sol. Answer (1)

Development of embryo from nucellus or integument.

91. In a flowering plant, archesporium gives rise to

(1) Only the wall of the sporangium
(2) Both wall and the sporogenous cells
(3) Wall and the tapetum
(4) Only tapetum and sporogenous cells

Sol. Answer (2)

Archesporial cells are initial cells.

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

(1) Nucellus or integuments
(2) Zygote
(3) Synergids or antipodals in an embryosac
(4) Accessory embryo sacs in the ovule

Sol. Answer (1)

93. Function of filiform apparatus is to

(1) Recognize the suitable pollen at stigma
(2) Stimulate division of generative cell
(3) Produce nectar
(4) Guide the entry of pollen tube

Sol. Answer (4)

SECTION - C

Assertion-Reason Type Questions

1. A : Each cell of the sporogenous tissue is capable of giving rise to a microspore tetrads.

R : Most abundant microspore tetrads is the product of simultaneous cytokinesis.

Sol. Answer (2)

2. A : In sporoderm, pectocellulosic layer is surrounded by sporopollenin.

R : Exine is differentiated into outer ektexine and inner endexine.

Sol. Answer (2)

3. A : The generative cell comes to lie freely in the cytoplasm of the tube cell.

R : Cellulosic wall around generative cell is dissolved.

Sol. Answer (3)

4. A : Restitutional nucleus can be observed in endothecium cells.

R : Endothecium cells are usually triploid.

Sol. Answer (4)

Restitutional nucleus formed in tapetum cells. At anaphase doubling of chromosome take place and it is surrounded by nuclear envelop.

5. A : Chalazal vacuole is present in the help cell of embryo sac.

R : Polarity of synergid cytoplasm is opposite to egg cell.

Sol. Answer (2)

Chalazal vacule is present in synergids.

6. A : Formation of mature male gametophyte requires one meiotic and one mitotic division in 60% of the angiosperms.

R : Pollination occurs in three celled condition in majority of angiosperms.

Sol. Answer (4)

Mature ♂ gametophyte need 1 Meiosis and two mitosis for all angiosperms.

7. A : Filiform apparatus guides the pollen tube into the synergids.

   R : It is special cellular thickening at micropylar tip to secrete chemotropic stimulus.

Sol. Answer (1)

8. A : Geitonogamy helps in maintaining homozygosity and superiority of the race indefinitely.

   R : It is functionally, ecologically and genetically cross pollination.

Sol. Answer (3)

Geitonogamy help in maintaining homozygosity because it is genetically self pollination. It is ecologically cross pollination because need pollinating agents. So functionally cross pollination.

9. A : Initial growth of pollen tube takes place on expenditure of food present in the stigma and style.

   R : Pollen tube travels intracellularly and chemotactically.

Sol. Answer (4)

Initial growth take place by using food in the pollen grain.

10. A : Eight cells of octant stage in dicot embryogeny are made by 2 vertical and one transverse divisions in embryonal cell.

    R : These cells are arranged in epibasal and hypobasal tier.

Sol. Answer (2)

11. A : Triple fusion is associated with the sexual reproduction in all spermatophytes.

    R : It is required to form definitive nucleus as nutritive tissue.

Sol. Answer (4)

Triple fusion is a feature of only angiosperm not gymnosperm so it is not applicable to all spermatophyte

12. A : Anatropous ovule is resupinate ovule.

    R : The body of ovule is completely bent with hilum close to micropylar end.

Sol. Answer (1)

13. A : More than one pollen tubes can enter an embryo sac.

    R : Double fertilization can occur by contribution of gametes from different pollens.

Sol. Answer (2)

14. A : Hybrid seeds have to be produced every year because seeds collected from hybrid plants, if sown subsequently, do not maintain hybrid characters.

    R : Hybrid seeds show segregation of traits.

Sol. Answer (1)

15. A : Growth of male gametophyte is completed over the female reproductive organ.

R : 2-celled stage of partial male gametophyte is developed *in-situ*.

Sol. Answer (2)

♂ gametophyte is liberated at 2 celled stage in 60% Angiosperm.

16. A : Certain proteins of pollen origin identifies the compatible stigma.

R : Compatibility proteins are found located in ektexine.

Sol. Answer (1)

Pollen grain carry independent proteins.

17. A : Tetraploid gametophyte can be produced from tetraploid sporophyte by means of apogamy.

R : Apogamy involves fertilisation, not meiosis.

Sol. Answer (4)

Apogamy is process of formation of spotophyte from the tissue of gametophyte.

18. A : Continued self-pollination checks inbreeding depression.

R : Pollen release and stigma receptivity are synchronised.

Sol. Answer (4)

Selfing cause inbreeding depressions.

19. A : Complete radicle is not produced by hypo-basal tier of octant embryo during Cruciferad development.

R : Hypophysis cell of suspensor contributes the tip of radicle in this type of development.

Sol. Answer (1)

20. A : Apomictic embryo is asexual mode of reproduction.

R : It prevents the segregation of traits.

Sol. Answer (2)

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