1. The egg apparatus is made up of two _____ and one _____ at the _____ end of the embryo sac.
(1) antipodals, egg cell, micropylar
(2) synergids, egg cell, chalazal
(3) egg cells, synergids, chalazal
(4) synergids, egg cells, micropylar

2. The cells of which of the following layers of the anther wall are multinucleated due to endomitosis?
(1) Epidemis
(2) Endothecium
(3) Middle layer
(4) Tapetum

3. A typical angiosperm anther is dithecous which means that it is:
(1) One lobed and the lobe has two theca
(2) Two lobed and each lobe has two theca
(3) Two lobed and each lobe has one theca
(4) Four lobed and each lobe has two theca

4. The pistil of *Papaver* is:
1. Monocarpellary
2. Multicarpellary apocarpous
3. Multicarpellary syncarpous
4. Absent

5. How many of the nuclei in the female gametophyte in angiosperms are surrounded by cell wall?
(1) 5
(2) 6
(3) 7
(4) 8

6. In what percent of angiosperms are the pollen grains shed at three cell stage?
(1) 20
(2) 40
(3) 60
(4) 80

7. The intine of the pollen grain is a:
1. Thick and discontinuous layer made of sporopollenin
2. Thick and continuous layer made of sporopollenin
3. Thin and discontinuous layer made of cellulose and pectin
4. Thin and continuous layer made of cellulose and pectin

8. In the monosporic embryo sac of a flowering plant, the number of nuclei that get surrounded by cell walls and thus are organized into cells is:
1. 5
2. 6
3. 7
4. 8

9. The ovule of an angiosperm is technically equivalent to
(1) megasporangium
(2) megasporophyll
(3) megaspore mother cell
(4) megaspore

10. Functional megaspore in an angiosperm develops into
(1) ovule
(2) endosperm
(3) embryo sac
(4) embryo

11. In majority of angiosperms
(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

12. Which one of the following statements is not true?
(1) Exine of pollen grains is made up of sporopollenin
(2) Pollen grains of many species cause severe allergies
(3) Stored pollen in liquid nitrogen can be used in the crop breeding programmes
(4) Tapetum helps in the dehiscence of anther

13. Filiform apparatus is characteristic feature of
(1) generative cell
(2) nucellar embryo
(3) aleurone cell
(4) synergids

14. Pollen tablets are available in the market for
(1) *In vitro* fertilisation
(2) breeding programmes
(3) supplementing food
(4) *Ex situ* conservation

15. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is
(1) cuticle
(2) sporopollenin
(3) lignin
(4) cellulose

16. What does the filiform apparatus do at the entrance into ovule?
(1) It helps in the entry of pollen tube into a synergid
(2) It prevents entry of more than one pollen tube into the embryo sac
(3) It brings about opening of the pollen tube
(4) It guides pollen tube from a synergid to egg

17. Which one of the following is resistant to enzyme action?
(1) Cork
(2) Wood fibre
(3) Pollen exine
(4) Leaf cuticle

18. Male gametes in angiosperms are formed by the division of:
(1) microspore
(2) generative cell
(3) vegetative cell
(4) microspore mother cell

19. In angiosperms, microsporogenesis and megasporogenesis
(1) occur in anther
(2) form gametes without further divisions
(3) involve meiosis
(4) occur in ovule

20. Male gametophyte in angiosperms produces
1. two sperms and a vegetative cell
2. single sperm and a vegetative cell
3. single sperm and two vegetative cells
4. three sperms

21. Which one of the following statements is not true?
1. Pollen grains are rich in nutrients and they are used in the form of tablets and syrups
2. Pollen grains of some plants cause severe allergies and bronchial afflictions in some
people
3. The flowers pollinated by flies and beetles secrete foul odour to attract them
4. Honey is made by bees by digesting pollen collected from flowers

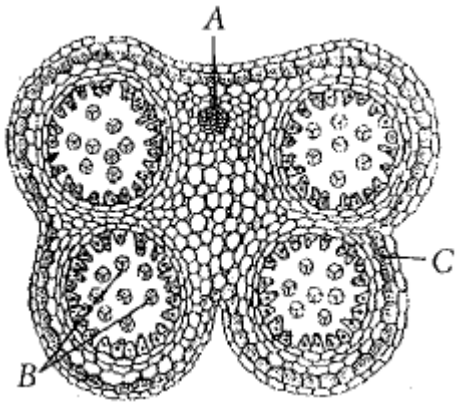
22. Pollen grains are able to withstand extremes of temperature and dessication because their exine is composed of
(1) cutin
(2) suberin
(3) sporopollenin
(4) callose

23. What is the charasteristic of tapetum ?
(1) It does not store food.
(2) It is multi-nucleated.
(3) It is multi-layered structure.
(4) It nourishes the megaspore.

24. The pollen grains of rice and wheat lose their viability in ___ minutes of their release.
(1) 30
(2) 10
(3) 60
(4) 90

25. What is the correct sequence of the formation of female gametophyte in angiosperms?
(1) Nucellus, megapore tetrad, megaspore mother cell, megaspore, female gametophyte
(2) Megaspore tetrad, nucellus, megaspore mother cell, megaspore, female gametophyte
(3) Nucellus, megaspore mother cell, megaspore tetrad, megaspore, female gametophyte
(4) Megaspore mother cell, megaspore tetrad, megaspore, nucellus, female gametophyte

26. The following is the diagram of T.S. of anther. Identify the parts labelled A, B and C.



(1) A - Connective tissue, B - Pollen grains, C - Endothecium
(2) A - Endothecium, B -Connective tissue, C - Pollen grains
(3) A - Pollen grains, B - Connective tissue, C - Endothecium
(4) A - Endothecium, B - Pollen grains, C - Connective tissue

27. The normal type of embryo sac is 8-nucleated and
(1) 8-celled
(2) 7-celled
(3) 6-celled
(4) 5-celled

28. Embryo sac is
(1) megaspore
(2) microgametophyte
(3) female gametophyte
(4) megasporangium

29. What is the number of microsporangia in each lobe of an angiosperm anther?
(1) Four
(2) Two
(3) Eight
(4) One

30. Which among the following extend longitudinally to become pollen sac?
(1) Microsporangia
(2) Filament of anther
(3) Tapetum
(4) Endothecium

31. Which among the following is not a wall layer of microsporangium?
(1) Endothecium
(2) Nucellus
(3) Tapetum
(4) Middle layers

32. All of the following statements are correct except:
(1) The proximal end of the filament is attached to the thalamus or the petal of the flower.
(2) The anther is a four-sided structure consisting of four microsporangia, two in each lobe.
(3) The number and length of stamens are variable in flowers of different species.
(4) In a longitudinal section, a typical microsporangium appears near circular in outline.

33. Which among the following statement is incorrect with respect to tapetum?
(1) It nourishes developing pollen grains.
(2) It has dense cytoplasm.
(3) It is the innermost wall layer of microsporangia.
(4) Cells have single nucleus only.

34. Match the following:

1	Sporogenous tissue	I	Process of formation of microspores from PMC by meiosis
2	Microspore tetrad	II	Microspores arranged in cluster of four cells
3	Microsporogenesis	III	Formation of microspore tetrad by meiosis
4	Tapetum	IV	Nourishes pollen grains

(1) 1-III ; 2-I ; 3-II ; 4-IV
(2) 1-III ; 2-II ; 3-I ; 4-IV
(3) 1-II ; 2-III ; 3-I ; 4-IV
(4) 1-II ; 2-III ; 3-IV ; 4-I

35. Which among the following is incorrect with respect to microsporogenesis?
(1) The cells of the sporogenous tissue undergo mitotic divisions to form microspore tetrads.
(2) Each cell of the sporogenous tissue is capable of giving rise to a microspore tetrad. Each one is a potential pollen or microspore mother cell (PMC).
(3) The microspores are arranged in a cluster of four cells called as the microspore tetrad.
(4) Inside each microsporangium several thousands of microspores or pollen grains are formed that are released with the dehiscence of anther.

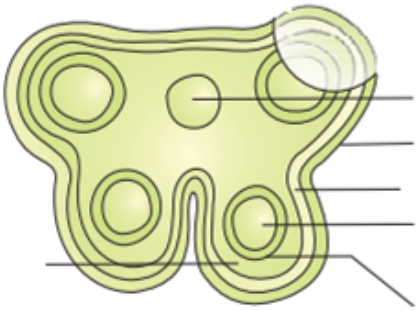
36. The pollen grains are shed at two-celled stage in
(1) 80% angiosperms
(2) 40% angiosperms
(3) 30% angiosperms
(4) 60% angiosperms

37. Match the following:

1	Male gametophyte	I	Embryo sac
2	Female gametophyte	II	Ovule
3	Megasporangium	III	Pollen grains
4	Microsporangium	IV	Pollen sacs

(1) 1-III ; 2-I ; 3-II ; 4-IV
(2) 1-I ; 2-II ; 3-III ; 4-IV
(3) 1-IV ; 2-III ; 3-II ; 4-I
(4) 1-III ; 2-II ; 3-I ; 4-IV

38. The following figure represents :



(1) Transverse section of young anther
(2) 3-D cut section of mature anther
(3) Cut section of filament
(4) Transverse section of mature filament

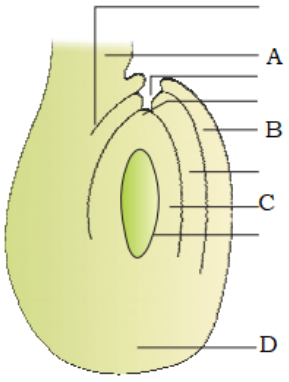
39. Identify A, B and X :-
X contains two cells - A and B. B is bigger than A, it has abundant food reserve and large irregularly shaped nucleus. A is small and floats in the cytoplasm of B. It is spindle shaped with dense cytoplasm and nucleus.

	A	**B**	**X**
(1)	Vegetative cell	Generative cell	Pollen grain
(2)	Generative cell	Vegetative cell	Pollen grain
(3)	Generative cell	Vegetative cell	Anther
(4)	Generative cell	Vegetative cell	Filament

40. Which among the following is not true about pollen grain?
(1) Rich in nutrients.
(2) Many species cause severe allergies and bronchial afflictions in some people often leading to chronic respiratory disorders– asthma, bronchitis, etc.
(3) Pollen consumption has been claimed to increase the performance race horses.
(4) *Parthenium* is used against pollen allergy.

41. Which among the following is not a feature of pistil?
(1) Monocarpellary
(2) Syncarpous
(3) Monosporic
(4) Apocarpous

42. A, B, C, D in the following diagram respectively are:-



(1) Hilum, funicle, inner integument, micropyle
(2) Hilum, funicle, outer integument, micropyle
(3) Funicle, outer integument, nucellus, chalazal pole
(4) Funicle, outer integument, nucellus, micropylar end

43. Microsporangium is generally surrounded by 4 wall layers. Which of the following 3 wall layers perform the function of protection and help in the dehiscence of anther to release the pollen?
(1) Epidermis, tapetum, endothecium
(2) Epidermis, aril, endothecium
(3) Epidermis, endodermis, mesocarp
(4) Epidermis, middle layer and endothecium

44.



The above diagram shows some stages in microgametogenesis. Identify A, Band C:

	A	B	C
(1)	Symmetric spindle	Generative cell	Vegetative cell
(2)	Symmetric spindle	Vegetative cell	Generative cell
(3)	Asymmetric spindle	Vegetative cell	Generative cell
(4)	Asymmetric spindle	Generative cell	Vegetative cell

45. The viability of pollen grains depends upon:
(1) Prevailing temperature
(2) Prevailing humidity
(3) Genetic potentiality of the concerned species
(4) All of the above

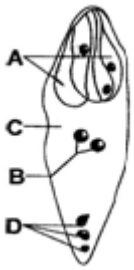
46. Which of the following has the least pollen viability?
(1) Cereals like wheat and rice
(2) Members of Rosaceae
(3) Members of Leguminoseae
(4) Members of Solanaceae

47. Match the Column-I with Column-II:

Column-I	Column-II
A. Funicle	I. Mass of cells within ovule with more food
B. Hilum	II. Basal part of ovule
C. Integument	III. One or 2 protective layers of ovule
D. Chalaza	IV. Region where body of ovule fuses with funicle
E. Nucellus	V. Stalk of ovule

(1) A - I, B - II, C - III, D - IV, E - V
(2) A - V, B - IV, C - III, D - II, E - I
(3) A - IV, B - II, C - I, D - III, E - V
(4) A - I, B - III, C - V, D - II, E - IV

48.



Identify A, B, C and D structures shown in above diagram of female gametophyte:

	A	B	C	D
(a)	Synergid	Polar nuclei	Central cell	Antipodal cells
(b)	Antipodal cells	Polar nuclei	Central cell	Synergids
(c)	Antipodal cells	Polar nuclei	Megaspore mother cell	Synergids
(d)	Filiform apparatus	Polar nuclei	Central cell	Antipodal cell

49. A typical angiosperm anther is bilobed with each lobe having two theca i.e. dithecous. Theca is separated often by :
1. A longitudinal groove running lengthwise.
2. A longitudinal groove running breadth wise.
3. A transverse groove running breadth wise.
4. A transverse groove running lengthwise.

50. Four statements are given below. How many of them are correct?
(1) The anther is a tetragonal structure, with four microsporangia at corners, two in each lobe.
(2) Microsporangia develops further and becomes a pollen sacs.
(3) A typical microsporangia is surrounded by four layered wall, 3-protective and 1 nutritional.
(4) The nutritive layer is densely cytoplasmic with more than one nucleus
Options :
1. 3
2. 4
3. 2

51. Which of the following statement is not correct for pollen grain?
1. It represents male gametophyte.
2. It is a spherical structure, about 25-50 micrometers in diameter.
3. Pollen grains are rich in nutrients.
4. In family rosaceae, leguminoseae and solanaceae pollen lose viability in 30 minute.

52. Read the statements and select option representing correct statements w.r.t. stamen.
A. The distal end of filament is attached to thalamus.
B. A typical anther is dithecous and bisporangiate.
C. Connective is sterile vasculated tissue.
D. Microsporangia develop further and become pollen sacs.
1. A & B
2. A & C
3. B & C
4. C & D

53. How many statement(s) is/are correct for pollen grains?
a. Parthenium is a cause of bronhial afflictions
b. Intine exhibits fascinating array of patterns and designs
c. Cytoplasm of pollen grain is s urrounded by spermoderm
d. Generative cell is present when pollens are shed in 40 percent plants.
1. One
2. Two
3. Three
4. Four

54. Fossilization of pollen grains is helped by
(1) Compatible protein
(2) Sporopollenin
(3) Cellulose
(4) Pectin

55. Gynoecium of Michelia and Papaver is similar in being

(1) Apocarpous
(2) Syncarpous
(3) Monocarpellary
(4) Polycarpellary

56. Find incorrect statement:

(1) A polycarpellary, apocarpous gynoecium is found in *Michelia*
(2) Many ovules are present in an ovary of papaya and orchids
(3) Yellowish, powdery pollen grains found in *Hibiscus*
(4) The more pistils may be fused together to form monocarpellary syncarpous gynoecium

57. Match the column with respect to pollen grain:

	Column I		Column II
a)	Vegetative Cell Nucleus	(i)	Abundant Reserve Food & Irregular Nucleus
b)	Germ Pore	(ii)	Spindle shaped with dense cytoplasm
c)	Exine	(iii)	Where the Sporopollenin is absent
		(iv)	Variable Pattern & design
		(v)	Continuous layer made up of Cellulose & pectin

(1) a(iv), b(v), c(iii)
(2) a(i), b(iii), c(v)
(3) a(i), b(iii), c(iv)
(4) a(iv), b(i), c(iii)

58. Which of the following statement is not associated with phenomenon of flowering?
(1) Decision for flowering takes place much before actual flower appears.
(2) During flowering several structural and hormonal changes takes place
(3) During flowering differentiation takes place
(4) Flowering is independent of environmental factors

59. When anther is young a group of compactly arranged homogenous cells are present in centre it is known as

(1) Sporogenous tissue
(2) Potential pollen mother cell
(3) Both 1 and 2
(4) Conjunctive tissue

60. The layers in the walls of the microsporangium that helps in the dehiscence of anther to release the pollen include:
I. Epidermis
II. Endothecium
III. Middle layers
IV. Tapetum
1. I and II only
2. I, II and III only
3. II and III only
4. I, II, III and IV

61. A typical anther shows
a. Two lobes with two theca each
b. Each lobe as dithecous
c. All cells in a given microsporangium as potential PMC
d. Thousands of microspores per microsporangium
Out of these statements :
1. b is incorrect
2. a and b are correct
3. c and d are incorrect
4. a, b, c and d are correct

62. Which one of the following statement is false in respect of flowering plants?
1. Parthenocarpy can be induced through the application of growth hormones
2. Integuments encircle the ovule except at the tip where a small opening called the germ pore is organized
3. Endosperm development precedes embryo development
4. Apomicts have several advantages in horticulture and agriculture

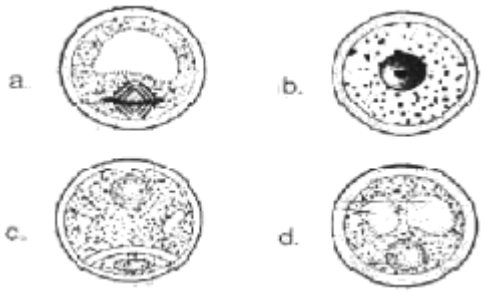
63. Megaspore mother cell differentiates from
1. Nucellus in the micropylar region.
2. Nucellus in the chalazal region.
3. Primary parietal cell in chalazal region.
4. Integument cell in micropylar region.

64. In a stamen proximal end of filament is attached to
1. Anther.
2. Thalamus or petals.
3. Sepals.
4. Gynoecium.

65. Which of the following has proved helpful in preserving pollens as fossils?
1. Pollenkit
2. Cellulosic intine
3. Oil content
4. Sporopollenin

66. Pollen grains can be stored for several years in liquid nitrogen having a temperature of
1. –120 °C
2. –80 °C
3. –196 °C
4. –160 °C

67. Arrange the following stages of microspore development into pollen grain, in correct sequence



1. b, c, d, and a
2. b, d, a and c
3. a, c, b and d
4. b, a, d and c

68. The gynoecium consists of many free pistils in flowers of
1. Aloe
2. Tomato
3. Papaver
4. Michelia

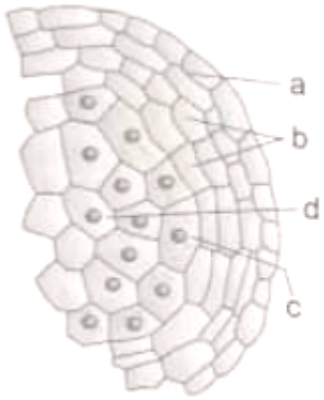
69. From the statements given below choose the option that are not true for a typical female gametophyte of a flowering plant:
(i) It is 8-nucleate and 7-celled at maturity
(ii) It is cellula during the development
(iii) It is situated inside the nuellus
(iv) It has an egg apparatus situated at the chalazal end
1. i and iv
2. ii and iii
3. i and ii
4. ii and iv

70. Following are four statements find out correct statements
(i) Microsporangia has four layers, outer three are protective and inner one is nutritive
(ii) Each cell of sporogenous tissue within micorsporangia is capable of giving raise to a microspore tetrad.
(iii) Dehydration of anther is important for seperation of pollen grains in a tetrad.
(iv) Generative cell in pollen grain is small with respect to vegetative cell and it floats in cytoplasm of vegetative cell.
Options
1. All are correct
2. Only (i), (ii) and (iii) is correct
3. Except (ii) all are correct
4. Expect (iii) all are correct.

71. The pollen grain represents
1. Male gamete
2. Male gametophyte
3. Microsporophyll
4. Microsporangium

72. The number of mitotic generations required to form a mature embryo sac from megaspore in most of the flowering plants is
1. One
2. Two
3. Three
4. Four

73. 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.	Endo-thecium	Tapetum	Micro-spore mother cell	Middle layer
2.	Tapetum	Endo-thecium	Micro-spore mother cell	Middle layer
3.	Endo-thecium	Middle layer	Tapetum	Micro-spore mother cell
4.	Endo-thecium	Micro-spore mother cell	Middle layer	Tapetum

74. The inner wall of pollen grain:
1. Is thin, continuous and pecto-cellulosic and is called intine
2. Comes out in the form of pollen tube through germpore
3. Is thick and consists of sporopollenin
4. (1) and (2)

75. Which is an 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 um in diameter.
IV. Sporopollenin is one of the most resistant organic materials 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

76. 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

77. The cell in the pollen grain which is responsible for giving rise to male gamete is
1. Rod shaped with dense cytoplasm
2. Of smaller size and float in the cytoplasm
3. Capable of dividing meiotically and give rise two male gamete
4. It has abundant food reserve and large irregularly shaped nucleus.

78. Which is the most common type of embryo sac in angiosperms?
1. Tetrasporic with one mitotic stage of divisions
2. Monosporic with three sequential mitotic divisions
3. Monosporic with two sequential mitotic divisions
4. Bisporic with two sequential mitotic divisions

79. Read the following statements carefully and select the correct
a. Tapetum cells possess dense cytoplasm and generally have more than one nucleus
b. Sporopollenin is absent in the areas called germ pore
c. Generative cell is small, spindle shaped with a irregularly shaped nuclei
d. Spindle of first mitosis in pollen is asymmetric
1. a,b,c & d
2. a,b & c
3. a,c & d
4. a,b & d

80. Ovule generally differentiate a single _____ in the _____ region of the nucellus.

(1) Megaspore mother cell, micropylar
(2) Megaspore, micropylar
(3) Megaspore, mother cell, chalazal
(4) Primary

81. Egg apparatus consists of
1. Central cell + egg cell
2. Synergids + polar nuclei + egg cell
3. Synergids + oosphere
4. Antipodal cells + synergids + egg

82. What is the most common shape and size of pollen grain in angiosperms plants?
1. Spindle-shaped, 25-50 μm
2. Spherical, 2-5 μm
3. Spherical, 25-50 μm
4. Spindle-shaped, 2-5 μm

83. In Polygonum type of embryo sac, polar nuclei
1. Are haploid
2. Can serve as a precursor of PEN
3. Occur in the large central cell
4. More than one option is correct

84. Pollen grains lose viability within 30 minutes of their release in the members of family
1. Rosaceae
2. Solanaceae
3. Poaceae
4. Leguminosae

85. Functional megaspore in Polygonum divides by free nuclear mitotic divisions and develops into 8 nucleated and 7 celled female gametophytes. The largest cell of this gametophyte is
1. Antipodal cell
2. Central cell
3. Synergid cell
4. Egg cell

86. Find the incorrect statements w.r.t. pollen grain in angiosperms plants
a. Germ pores are areas in pollen wall where intine and sporopollenin are absent
b. The vegetative cell is bigger, has abundant food reserves, and a large irregularly shaped nucleus
c. The fascinating array of patterns and designs are exhibited by exine wall
d. In over 60 percent of angiosperms, pollen grains are shed at 3-celled stage
1. c and d
2. a and d
3. b and d
4. a and c

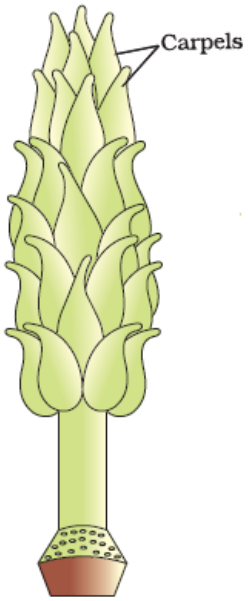
87. During microsporogenesis
1. Microspore tetrad is developed by meiosis in sporogenous tissue
2. Pollen grains are developed by mitosis in sporogenous tissue
3. Microspore develops into the male gametophyte
4. Male gametes are produced by pollen grain

88. The stalk by which an ovule is attached to the placenta is called
1. Funicle
2. Hilum
3. Chalaza
4. Micropyle

89. Choose the correct match w.r.t. angiosperm
1. Microsporanigum - ovule; Megasporangium - female gametophyte
2. Megasporangium - ovule; Embryo sac - female gametophyte
3. Megasporangium - female gametophyte; Embryo sac - ovule
4. Nucellus - male gametophyte; Megasporangium - ovule

90. Formation of embryo sac from a single megaspore nuclei is termed as
1. Bishopric development
2. Monosporic development
3. Tetrasporic development
4. Polysporic development

91. Recognise the diagram and choose the correct option:-

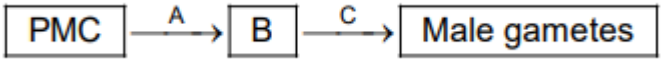


1. Hibiscus, multicarpellary syncarpous pistil
2. Multicarpellary syncarpous pistil of papaver
3. Multicarpellary apocarpous gynoecium of Michelia
4. Monocarpellary gynoecium

92. A typical anther is
(a) Tetrasporangiate
(b) Tetragonal
(c) Trilobed
(d) Surrounded by four wall layers
The correct ones are
1. Only (a), (b) and (d)
2. Only (a) and (d)
3. Only (b) and (c)
4. All (a), (b), (c) and (d)

93. The anther wall layer which is usually polyploid and has dense cytoplasm as well as high DNA content is
1. Endothelium
2. Tapetum
3. Epidermis
4. Middle layer

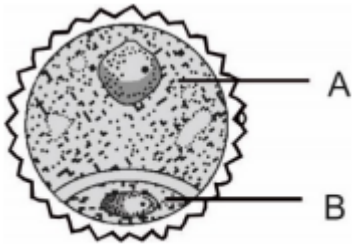
94. Complete the below given schematic representation by choosing the correct option.



	A	B	C
1.	Mitosis	Microspore tetrad	Meiosis
2.	Mitosis	Pollen grain	Meiosis
3.	Meiosis	Pollen	Syngamy
4.	Meiosis	Pollen grain	Mitosis

95. Mark the wrongly matched pair
1. Amaranthus - Causes pollen allergy
2. Pollen banks - Store pollen at -196°C
3. Pea - Pollens are viable for only 30 minutes
4. Pollen grains - Rich in nutrients

96. In the following figure identify the parts labeled as A and B and select the option stating true features of them.



	A	B
1.	Forms gametes	Smaller in size
2.	Stores food reserve	Irregulary shaped nucleus
3.	Irregular shaped nucleus	Spindle-shaped cell
4.	Bigger in size	Forms female gametes

97. Mark the wrong statement regarding egg apparatus
1. It is seven celled
2. It is found at the micropylar end of the ovule
3. Its cells are haploid
4. It contains single egg cell

98. Largest cell in embryo sac of angiosperm is
1. Synergid cell
2. Egg
3. Antipodal cell
4. Central cell

99. Hilum represents the junction between
1. Funicle and nucellus
2. Ovule and funicle
3. Chalaza and funicle
4. Funicle and micropyle

100. The outermost and innermost wall layers of microsporangium in an anther are respectively.
1. Endothecium and tapetum
2. Epidermis and endodermis
3. Epidermis and middle layer
4. Epidermis and tapetum

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