CHAPTER 2

Sexual Reproduction in Flowering Plants

2.2 Pre-Fertilisation : Structures and Events

1. The plant parts which consist of two generations-one within the other
(1) pollen grains inside the anther
(2) germinated pollen grain with two male gametes
(3) seed inside the fruit
(4) embryo sac inside the ovule
(a) (1) only (b) (1), (2), and (3)
(c) (3) and (4) (d) (1) and (4).
(NEET 2020)

2. 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)

3. Which is the most common type of embryo sac in angiosperms ?
(a) Tetrasporic with one mitotic stage of divisions
(b) Monosporic with three sequential mitotic divisions
(c) Monosporic with two sequential mitotic divisions
(d) Bisporic with two sequential mitotic divisions
(Odisha NEET 2019)

4. What type of pollination takes place in *Vallisneria*?
(a) Pollination occurs in submerged condition by water.
(b) Flowers emerge above surface of water, and pollination occurs by insects.
(c) Flowers emerge above water surface, and pollen is carried by wind.
(d) Male flowers are carried by water currents to female flowers at surface of water.
(Odisha NEET 2019)

5. In which one of the following, both autogamy and geitonogamy are prevented?
(a) Wheat (b) Papaya
(c) Castor (d) Maize
(Odisha NEET 2019)

6. Pollen grains can be stored for several years in liquid nitrogen having a temperature of
(a) –120°C (b) –80°C
(c) –196°C (d) –160°C. *(NEET 2018)*

7. Which of the following has proved helpful in preserving pollen as fossils?
(a) Pollenkitt (b) Cellulosic intine
(c) Oil content (d) Sporopollenin
(NEET 2018)

8. Winged pollen grains are present in
(a) mustard (b) *Cycas*
(c) mango (d) *Pinus.* *(NEET 2018)*

9. Functional megaspore in an angiosperm develops into an
(a) endosperm (b) embryo sac
(c) embryo (d) ovule. *(NEET 2017)*

10. Attractants and rewards are required for
(a) entomophily (b) hydrophily
(c) cleistogamy (d) anemophily.
(NEET 2017)

11. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by
(a) bee (b) wind
(c) bat (d) water. *(NEET 2017)*

12. A dioecious flowering plant prevents both
(a) autogamy and geitonogamy
(b) geitonogamy and xenogamy
(c) cleistogamy and xenogamy
(d) autogamy and xenogamy. *(NEET 2017)*

13. 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 that embryo sac. *(NEET-II 2016)*

14. 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-II 2016)*

15. The ovule of an angiosperm is technically equivalent to
(a) megasporangium
(b) megasporophyll
(c) megaspore mother cell
(d) megaspore. *(NEET-II 2016)*

16. Which one of the following statements is not true?
(a) Pollen grains of many species cause severe allergies.
(b) Stored pollen in liquid nitrogen can be used in the crop breeding programmes.
(c) Tapetum helps in the dehiscence of anther.
(d) Exine of pollen grains is made up of sporopollenin. *(NEET-I 2016)*

17. Which of the following statements is not correct?
(a) Pollen germination and pollen tube growth are regulated by chemical components of pollen interacting with those of the pistil.
(b) Some reptiles have also been reported as pollinators in some plant species.
(c) 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.
(d) Insects that consume pollen or nectar without bringing about pollination are called pollen/nectar robbers. *(NEET-I 2016)*

18. Proximal end of the filament of stamen is attached to the
(a) placenta (b) thalamus or petal
(c) anther (d) connective.
(NEET-I 2016)

19. Filiform apparatus is characteristic feature of
(a) aleurone cell (b) synergids
(c) generative cell (d) nucellar embryo.
(2015)

20. In angiosperms, microsporogenesis and megasporo -genesis
(a) involve meiosis
(b) occur in ovule
(c) occur in anther
(d) form gametes without further divisions. *(2015)*

21. Male gametophyte in angiosperms produces
(a) single sperm and two vegetative cells
(b) three sperms
(c) two sperms and a vegetative cell
(d) single sperm and a vegetative cell. *(2015)*

22. Which of the following are the important floral rewards to the animal pollinators ?
(a) Floral fragrance and calcium crystals
(b) Protein pellicle and stigmatic exudates
(c) Colour and large size of flower
(d) Nectar and pollen grains *(2015 Cancelled)*

23. Which one of the following may require pollinators, but is genetically similar to autogamy?
(a) Apogamy (b) Cleistogamy
(c) Geitonogamy (d) Xenogamy
(2015 Cancelled)

24. Which one of the following statements is not true?
(a) The flowers pollinated by flies and bats secrete foul odour to attract them.
(b) Honey is made by bees by digesting pollen collected from flowers.
(c) Pollen grains are rich in nutrients and they are used in the form of tablets and syrups.
(d) Pollen grains of some plants cause severe allergies and bronchial afflictions in some people. *(2015 Cancelled)*

25. The hilum is a scar on the
(a) fruit, where style was present
(b) seed, where micropyle was present
(c) seed, where funicle was attached
(d) fruit, where it was attached to pedicel.
(2015 Cancelled)

26. Transmission tissue is characteristic feature of
(a) dry stigma (b) wet stigma
(c) hollow style (d) solid style.
(2015 Cancelled)

27. Geitonogamy involves
(a) fertilisation of a flower by the pollen from another flower of the same plant
(b) fertilisation of a flower by the pollen from the same flower
(c) fertilisation of a flower by the pollen from a flower of another plant in the same population
(d) fertilisation of a flower by the pollen from a flower of another plant belonging to a distant population. *(2014)*

28. Pollen tablets are available in the market for
(a) *in vitro* fertilisation (b) breeding programmes
(c) supplementing food (d) *ex situ* conservation.
(2014)

29. Function of filiform apparatus is to
(a) recognise the suitable pollen at stigma
(b) stimulate division of generative cell
(c) produce nectar
(d) guide the entry of pollen tube. *(2014)*

30. Advantage of cleistogamy is
(a) no dependence on pollinators
(b) vivipary
(c) higher genetic variability
(d) more vigorous offspring. *(NEET 2013)*

31. Megasporangium is equivalent to
(a) nucellus (b) ovule
(c) embryo sac (d) fruit. *(NEET 2013)*

32. Which one of the following statements is correct?
(a) Endothecium produces the microspores.
(b) Tapetum nourishes the developing pollen.
(c) Hard outer layer of pollen is called intine.
(d) Sporogenous tissue is haploid. *(NEET 2013)*

33. Animal vectors are required for pollination in
(a) *Vallisneria* (b) mulberry
(c) cucumber (d) maize.
(Karnataka NEET 2013)

34. Megaspores are produced from the megaspore mother cells after
(a) mitotic division
(b) formation of thick wall
(c) differentiation
(d) meiotic division. *(Karnataka NEET 2013)*

35. Which one of the following statements is correct?
(a) Cleistogamous flowers are always autogamous.
(b) Xenogamy occurs only by wind pollination.
(c) Chasmogamous flowers do not open at all.
(d) Geitonogamy involves the pollen and stigma of flowers of different plants.
(Karnataka NEET 2013)

36. Which of the following statements is correct?
(a) Sporopollenin can be degraded by enzymes.
(b) Sporopollenin is made up of inorganic materials.
(c) Sporopollenin can withstand high temperatures as well as strong acids and alkalis.
(d) Sporopollenin can withstand high temperatures but not strong acids. *(Karnataka NEET 2013)*

37. Both, autogamy and geitonogamy are prevented in
(a) papaya (b) cucumber
(c) castor (d) maize. *(2012)*

38. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is
(a) cuticle (b) sporopollenin
(c) lignin (d) cellulose. *(2012)*

39. Even in absence of pollinating agents seed-setting is assured in
(a) *Commelina* (b) *Zostera*
(c) *Salvia* (d) fig. *(2012)*

40. 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 *(Mains 2012)*

41. Plants with ovaries having only one or a few ovules, are generally pollinated by
(a) bees (b) butterflies
(c) birds (d) wind. *(Mains 2012)*

42. Filiform apparatus is a characteristic feature of
(a) suspensor (b) egg
(c) synergid (d) zygote. *(2011)*

43. Which one of the following pollinations is autogamous?
(a) Geitonogamy (b) Xenogamy
(c) Chasmogamy (d) Cleistogamy *(2011)*

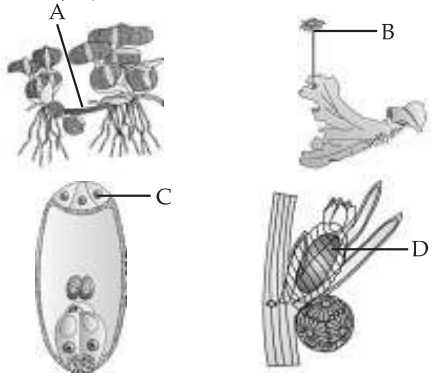
44. Wind pollination is common in
(a) legumes (b) lilies
(c) grasses (d) orchids. *(2011)*

45. In angiosperms, functional megaspore develops into
(a) embryo sac (b) ovule
(c) endosperm (d) pollen sac.
(Mains 2011)

46. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called
(a) xenogamy (b) geitonogamy
(c) karyogamy (d) autogamy. *(2010)*

47. Wind pollinated flowers are
(a) small, brightly coloured, producing large number of pollen grains
(b) small, producing large number of dry pollen grains
(c) large producing abundant nectar and pollen
(d) small, producing nectar and dry pollen. *(2010)*

48. Examine the figures (A-D) given below and select the right option out of (a – d), in which all the four structures A, B, C and D are identified correctly.



	A	B	C	D
(a)	Rhizome	Sporangio-phore	Polar cell	Globule
(b)	Runner	Archegonio-phore	Synergid	Antheridium
(c)	Offset	Antheridio-phore	Antipodals	Oogonium
(d)	Sucker	Seta	Megaspore mother cell	Gemma cup

(Mains 2010)

49. Which one of the following pairs of plant structures has haploid number of chromosomes?
(a) Nucellus and antipodal cells
(b) Egg nucleus and secondary nucleus
(c) Megaspore mother cell and antipodal cells
(d) Egg cell and antipodal cells *(2008)*

50. What does the filiform apparatus do at the entrance into ovule?
(a) It brings about opening of the pollen tube.
(b) It guides pollen tube from a synergid to egg.
(c) It helps in the entry of pollen tube into a synergid.
(d) It prevents entry of more than one pollen tube into the embryo sac. *(2008)*

51. Unisexuality of flowers prevents
(a) geitonogamy, but not xenogamy
(b) autogamy and geitonogamy
(c) autogamy, but not geitonogamy
(d) both geitonogamy and xenogamy. *(2008)*

52. Which one of the following is resistant to enzyme action?
(a) Pollen exine (b) Leaf cuticle
(c) Cork (d) Wood fibre
(Mains 2008)

53. Male gametes in angiosperms are formed by the division of
(a) generative cell
(b) vegetative cell
(c) microspore mother cell
(d) microspore. *(2007)*

54. Which one of the following is surrounded by a callose wall?
(a) Male gamete
(b) Egg
(c) Pollen grain
(d) Microspore mother cell *(2007)*

55. The arrangement of the nuclei in a normal embryo sac in the dicot plants is
(a) 3 + 3 + 2 (b) 2 + 4 + 2
(c) 3 + 2 + 3 (d) 2 + 3 + 3. *(2006)*

56. 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) Amphitropous (b) Circinotropous
(c) Atropous (d) Anatropous *(2005)*

57. An ovule which becomes curved so that the nucellus and embryo sac lie at right angles to the funicle is
(a) hemitropous (b) campylotropous
(c) anatropous (d) orthotropous. *(2004)*

58. Anthesis is a phenomenon which refers to
(a) reception of pollen by stigma
(b) formation of pollen
(c) development of anther
(d) opening of flower bud. *(2004)*

59. In a flowering plant, archesporium gives rise to
(a) only the wall of the sporangium
(b) both wall and the sporogenous cells
(c) wall and the tapetum
(d) only tapetum and sporogenous cells. *(2003)*

60. In angiosperm, all the four microspores of tetrad are covered by a layer which is formed by
(a) pectocellulose (b) callose
(c) cellulose (d) sporopollenin. *(2002)*

61. What is the direction of micropyle in anatropous ovule?
(a) Upward (b) Downward
(c) Right (d) Left *(2002)*

62. In grasses what happens in microspore mother cell for the formation of mature pollen grains?
(a) One meiotic and two mitotic divisions
(b) One meiotic and one mitotic divisions
(c) One meiotic division
(d) One mitotic division *(2001)*

63. Anemophily type of pollination is found in
(a) *Salvia* (b) bottlebrush
(c) *Vallisneria* (d) coconut. *(2001)*

64. Eight nucleated embryo sac is
(a) only monosporic (b) only bisporic
(c) only tetrasporic (d) any of these. *(2000)*

65. If there are 4 cells in anthers, what will be the number of pollen grains?
(a) 16 (b) 12
(c) 8 (d) 4 *(1996)*

66. The anthesis is a phenomenon, which refers to
(a) development of anthers
(b) opening of flower bud
(c) stigma receptors
(d) all of these. *(1995)*

67. In an angiosperm, how many microspore mother cells are required to produce 100 pollen grains?
(a) 75 (b) 100
(c) 25 (d) 50 *(1995)*

68. When pollen of a flower is transferred to the stigma of another flower of the same plant, the pollination is referred to as
(a) autogamy (b) geitonogamy
(c) xenogamy (d) allogamy. *(1994)*

69. Embryo sac represents
(a) megaspore (b) megagametophyte
(c) megasporophyll (d) megagamete. *(1994)*

70. Number of meiotic divisions required to produce 200/400 seeds of pea would be
(a) 200/400 (b) 400/800
(c) 300/600 (d) 250/500. *(1993)*

71. Ovule is straight with funiculus, embryo sac, chalaza and micropyle lying on one straight line. It is
(a) orthotropous (b) anatropous
(c) campylotropous (d) amphitropous. *(1993)*

72. Meiosis is best observed in dividing
(a) cells of apical meristem
(b) cells of lateral meristem
(c) microspores and anther wall
(d) microsporocytes. *(1992)*

73. Point out the odd one.
(a) Nucellus (b) Embryo sac
(c) Micropyle (d) Pollen grain *(1991)*

74. Pollination occurs in
(a) bryophytes and angiosperms
(b) pteridophytes and angiosperms
(c) angiosperms and gymnosperms
(d) angiosperms and fungi. *(1991)*

75. Entry of pollen tube through micropyle is
(a) chalazogamy (b) mesogamy
(c) porogamy (d) pseudogamy. *(1990)*

76. Female gametophyte of angiosperms is represented by
(a) ovule
(b) megaspore mother cell
(c) embryo sac
(d) nucellus. *(1990)*

77. Male gametophyte of angiosperms/monocots is
(a) microsporangium (b) nucellus
(c) microspore (d) stamen. *(1990)*

78. Which is correct?
(a) Gametes are invariably haploid.
(b) Spores are invariably haploid.
(c) Gametes are generally haploid.
(d) Both spores and gametes are invariably haploid. *(1989)*

79. Generative cell was destroyed by laser but a normal pollen tube was still formed because
(a) vegetative cell is not damaged
(b) contents of killed generative cell stimulate pollen growth
(c) laser beam stimulates growth of pollen tube
(d) the region of emergence of pollen tube is not harmed. *(1989)*

80. Total number of meiotic divisions required for forming 100 zygotes/100 grains of wheat is
(a) 100 (b) 75
(c) 125 (d) 50. *(1988)*

81. Male gametophyte of angiosperms is shed at
(a) four celled pollen grain
(b) three celled pollen grain
(c) microspore mother cell
(d) anther. *(1988)*

2.3 Double Fertilisation

82. What is the fate of the male gametes discharged in the synergid?
(a) One fuses with the egg and other fuses with central cell nuclei.
(b) One fuses with the egg, other(s) degenerates in the synergid.
(c) All fuse with the egg.
(d) One fuses with the egg, other(s) fuse(s) with synergid nucleus. *(NEET 2019)*

83. Double fertilisation is
(a) fusion of two male gametes of a pollen tube with two different eggs
(b) fusion of one male gamete with two polar nuclei
(c) fusion of two male gametes with one egg
(d) syngamy and triple fusion. *(NEET 2018)*

84. Double fertilisation is exhibited by
(a) algae (b) fungi
(c) angiosperms (d) gymnosperms. *(NEET 2017)*

85. Which one of the following statements is wrong?
(a) When pollen is shed at two-celled stage, double fertilisation 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. *(Mains 2012)*

86. Through which cell of the embryo sac, does the pollen tube enter the embryo sac?
(a) Egg cell
(b) Persistant synergid
(c) Degenerated synergids
(d) Central cell *(2005)*

87. In angiosperms, pollen tube liberate their male gametes into the
(a) central cell (b) antipodal cells
(c) egg cell (d) synergids. *(2002)*

88. Endosperm is formed during the double fertilisation by
(a) two polar nuclei and one male gamete
(b) one polar nuclei and one male gamete
(c) ovum and male gamete
(d) two polar nuclei and two male gametes. *(2000)*

89. The role of double fertilisation in angiosperms is to produce
(a) cotyledons (b) endocarp
(c) endosperm (d) integuments.
(1998, 1996)

90. Double fertilisation is characteristic of
(a) angiosperms (b) anatropous
(c) gymnosperms (d) bryophytes. *(1993)*

91. Double fertilisation is fusion of
(a) two eggs
(b) two eggs and polar nuclei with pollen nuclei
(c) one male gamete with egg and other with synergid
(d) one male gamete with egg and other with secondary nucleus. *(1991)*

92. Syngamy means
(a) fusion of gametes
(b) fusion of cytoplasms
(c) fusion of two similar spores
(d) fusion of two dissimilar spores. *(1991)*

93. Which of the following pair have haploid structures?
(a) Nucellus and antipodal cells
(b) Antipodal cells and egg cell
(c) Antipodal cells and megaspore mother cell
(d) Nucellus and primary endosperm nucleus
(1991)

94. Double fertilisation and triple fusion were discovered by
(a) Hofmeister
(b) Nawaschin and Guignard
(c) Leeuwenhoek
(d) Strasburger. *(1988)*

2.4 Post-Fertilisation : Structures and Events

95. Persistent nucellus in the seed is known as
(a) tegmen (b) chalaza
(c) perisperm (d) hilum. *(NEET 2019)*

96. Which one of the following statements regarding post-fertilisation development in flowering plants is incorrect?
(a) Ovules develop into embryo sac.
(b) Ovary develops into fruit.
(c) Zygote develops into embryo.
(d) Central cell develops into endosperm.
(NEET 2019)

97. The coconut water from tender coconut represents
(a) free nuclear proembryo
(b) free nuclear endosperm
(c) endocarp
(d) fleshy mesocarp. *(NEET-I 2016)*

98. Coconut water from a tender coconut is
(a) innermost layers of the seed coat
(b) degenerated nucellus
(c) immature embryo
(d) free nuclear endosperm. *(2015)*

99. Which one of the following fruits is parthenocarpic?
(a) Jackfruit (b) Banana
(c) Brinjal (d) Apple *(2015)*

100. Non-albuminous seed is produced in
(a) maize (b) castor
(c) wheat (d) pea. *(2014)*

101. Seed coat is not thin, membranous in
(a) groundnut (b) gram
(c) maize (d) coconut.
(NEET 2013)

102. Perisperm differs from endosperm in
(a) being a diploid tissue
(b) its formation by fusion of secondary nucleus with several sperms
(c) being a haploid tissue
(d) having no reserve food. *(NEET 2013)*

103. Albuminous seeds store their reserve food mainly in
(a) endosperm (b) cotyledons
(c) hypocotyl (d) perisperm.
(Karnataka NEET 2013)

104. The viability of seeds is tested by
(a) 2, 6 dichlorophenol indophenol
(b) 2, 3, 5 triphenyl tetrazolium chloride
(c) DMSO
(d) Safranine. *(Karnataka NEET 2013)*

105. Two plants can be conclusively said to belong to the same species if they
(a) have more than 90 percent similar genes
(b) look similar and possess identical secondary metabolites
(c) have same number of chromosomes
(d) can reproduce freely with each other and form seeds. *(2007)*

106. In a cereal grain the single cotyledon of embryo is represented by
(a) coleoptile (b) coleorhiza
(c) scutellum (d) prophyll. *(2006)*

107. The embryo in sunflower has
(a) two cotyledons (b) many cotyledons
(c) no cotyledon (d) one cotyledon. *(1998)*

95. On selfing a plant of F_1-generation with genotype "AABbCC", the genotypic ratio in F_2-generation will be
(a) 3 : 1
(b) 1 : 1
(c) 9 : 3 : 3 : 1
(d) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1. *(2002)*

96. In human beings, multiple genes are involved in the inheritance of
(a) sickle-cell anaemia (b) skin colour
(c) colour blindness (d) phenylketonuria. *(1999)*

97. How many different types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?
(a) Six (b) Nine
(c) Two (d) Four *(1998)*

98. The polygenic genes show
(a) different karyotypes (b) different genotypes
(c) different phenotypes (d) none of these. *(1996)*

99. A polygenic inheritance in human beings is
(a) skin colour (b) phenylketonuria
(c) colour blindness (d) sickle cell anaemia. *(1993)*

5.5 Pleiotropy

100. Match the terms in column I with their description in column II and choose the correct option.

	Column I		Column II
A.	Dominance	(i)	Many genes govern a single character
B.	Co-dominance	(ii)	In a heterozygous organism only one allele expresses itself
C.	Pleiotropy	(iii)	In a heterozygous organism both alleles express themselves fully
D.	Polygenic	(iv)	A single gene inheritance influences many characters

	A	B	C	D
(a)	(iv)	(i)	(ii)	(iii)
(b)	(iv)	(iii)	(i)	(ii)
(c)	(ii)	(i)	(iv)	(iii)
(d)	(ii)	(iii)	(iv)	(i) *(NEET-I 2016)*

101. A pleiotropic gene
(a) controls a trait only in combination with another gene
(b) controls multiple traits in an individual
(c) is expressed only in primitive plants
(d) is a gene evolved during Pliocene. *(2015)*

102. Which of the following is an example of pleiotropy?
(a) Haemophilia (b) Thalassemia
(c) Sickle cell anaemia (d) Colour blindness *(2002)*

103. When a single gene influences more than one trait it is called
(a) pseudodominance (b) pleiotropy
(c) epistasis (d) none of these. *(1998)*

5.6 Sex Determination

104. Select the incorrect statement.
(a) Human males have one of their sex-chromosome much shorter than other.
(b) Male fruit fly is heterogametic.
(c) In male grasshoppers, 50% of sperms have no sex-chromosome.
(d) In domesticated fowls, sex of progeny depends on the type of sperm rather than egg. *(NEET 2019)*

105. Which of the following pairs is wrongly matched?
(a) Starch synthesis in pea : Multiple alleles
(b) ABO blood grouping : Co-dominance
(c) XO type sex determination: Grasshopper
(d) T.H. Morgan : Linkage *(NEET 2018)*

106. Which one of the following conditions of the zygotic cell would lead to the birth of a normal human female child?
(a) Two X chromosomes
(b) Only one Y chromosome
(c) Only one X chromosome
(d) One X and one Y chromosome *(Mains 2011)*

107. In *Drosophila*, the sex is determined by
(a) the ratio of number of X-chromosome to the sets of autosomes
(b) X and Y chromosomes
(c) the ratio of pairs of X-chromosomes to the pairs of autosomes
(d) whether the egg is fertilized or develops parthenogenetically. *(2003)*

108. Number of Barr bodies in XXXX female is
(a) 1 (b) 2
(c) 3 (d) 4. *(2001)*

109. Male XX and female XY sometime occur due to
(a) deletion
(b) transfer of segments in X and Y chromosome
(c) aneuploidy
(d) hormonal imbalance. *(2001)*

110. Probability of four sons to a couple is
(a) 1/4 (b) 1/8
(c) 1/16 (d) 1/32. *(2001)*

111. Genetic identity of a human male is determined by
(a) sex-chromosome (b) cell organelles
(c) autosome (d) nucleolus. *(1997)*

112. When an animal has both the characters of male and female, it is called
(a) super female (b) super male
(c) intersex (d) gynandromorph. *(1996)*

113. Mr. Kapoor has Bb autosomal gene pair and d allele sex-linked. What shall be proportion of Bd in sperms?
(a) Zero (b) 1/2
(c) 1/4 (d) 1/8 *(1993)*

114. Sex is determined in human beings
(a) by ovum
(b) at time of fertilisation
(c) 40 days after fertilisation
(d) seventh to eight week when genitals differentiate in fetus. *(1993)*

115. A normal green male maize is crossed with albino female. The progeny is albino because
(a) trait for a albinism is dominant
(b) the albinos have biochemical to destroy plastids derived from green male
(c) plastids are inherited from female parent
(d) green plastids of male must have mutated. *(1989)*

116. A family of five daughter only is expecting sixth issue. The chance of its being a son is
(a) zero (b) 25%
(c) 50% (d) 100%. *(1988)*

5.7 Mutation

117. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F_2 progenies that mutation is found in
(a) one-third of the progenies
(b) none of the progenies
(c) all the progenies
(d) fifty percent of the progenies. *(2004)*

118. The most striking example of point mutation is found in a disease called
(a) Down's syndrome (b) sickle cell anaemia
(c) thalassaemia (d) night blindness. *(1995)*

5.8 Genetic Disorders

119. Select the correct match.
(a) Haemophilia – Y linked
(b) Phenylketonuria – Autosomal dominant trait
(c) Sickle cell anaemia – Autosomal recessive trait,chromosome -11
(d) Thalassemia – X linked *(NEET 2020)*

120. What is the genetic disorder in which an individual has an overall masculine development, gynaecomastia and is sterile?
(a) Down's syndrome
(b) Turner's syndrome
(c) Klinefelter's syndrome
(d) Edward syndrome *(NEET 2019)*

121. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by
(a) only daughters
(b) only sons
(c) only grandchildren
(d) both sons and daughters. *(NEET 2018)*

122. Thalassemia and sickle cell anaemia are caused due to a problem in globin molecule synthesis. Select the correct statement.
(a) Both are due to a quantitative defect in globin chain synthesis.
(b) Thalassemia is due to less synthesis of globin molecules.
(c) Sickle cell anaemia is due to a quantitative problem of globin molecules.
(d) Both are due to a qualitative defect in globin chain synthesis. *(NEET 2017)*

123. A disease caused by an autosomal primary non-disjunction is
(a) Klinefelter's syndrome
(b) Turner's syndrome
(c) Sickle cell anaemia
(d) Down's syndrome. *(NEET 2017)*

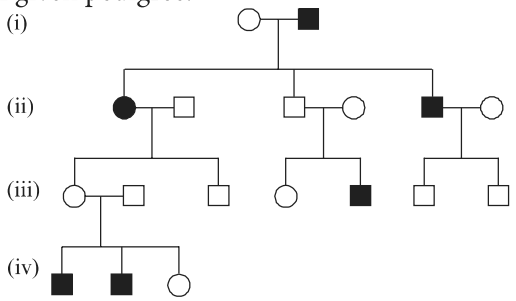
124. If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is
(a) 0 (b) 0.5
(c) 0.75 (d) 1. *(NEET-II 2016)*

125. Pick out the correct statements.
(1) Haemophilia is a sex-linked recessive disease.
(2) Down's syndrome is due to aneuploidy.
(3) Phenylketonuria is an autosomal recessive gene disorder.
(4) Sickle cell anaemia is an X-linked recessive gene disorder.
(a) (1), (3) and (4) are correct.
(b) (1), (2) and (3) are correct.
(c) (1) and (4) are correct.
(d) (2) and (4) are correct. *(NEET-I 2016)*

126. Which of the following most appropriately describes haemophilia?
(a) Chromosomal disorder
(b) Dominant gene disorder
(c) Recessive gene disorder
(d) X-linked recessive gene disorder
(NEET-I 2016)

127. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson being colour blind ?
(a) Nil (b) 0.25
(c) 0.5 (d) 1 *(2015)*

128. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree.



(a) Autosomal recessive
(b) X-linked dominant
(c) Autosomal dominant
(d) X-linked recessive *(2015)*

129. An abnormal human baby with 'XXX' sex chromosomes was born due to
(a) fusion of two ova and one sperm
(b) fusion of two sperms and one ovum
(c) formation of abnormal sperms in the father
(d) formation of abnormal ova in the mother.
(2015 Cancelled)

130. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage of male children of this couple will be colour blind?
(a) 25% (b) 0%
(c) 50% (d) 75% *(2014)*

131. A human female with Turner's syndrome
(a) has 45 chromosomes with XO
(b) has one additional X chromosome
(c) exhibits male characters
(d) is able to produce children with normal husband. *(2014)*

132. Select the incorrect statement with regard to haemophilia.
(a) It is a dominant disease.
(b) A single protein involved in the clotting of blood is affected.
(c) It is a sex-linked disease.
(d) It is a recessive disease. *(NEET 2013)*

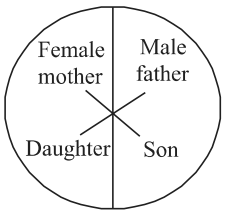
133. If both parents are carriers for thalassaemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
(a) 25% (b) 100%
(c) No chance (d) 50% *(NEET 2013)*

134. Which one is the incorrect statement with regard to the importance of pedigree analysis?
(a) It confirms that DNA is the carrier of genetic information.
(b) It helps to understand whether the trait in question is dominant or recessive.
(c) It confirms that the trait is linked to one of the autosome.
(d) It helps to trace the inheritance of a specific trait. *(Karnataka NEET 2013)*

135. Down's syndrome in humans is due to
(a) three 'X' chromosomes
(b) three copies of chromosome 21
(c) monosomy
(d) two 'Y' chromosomes. *(Karnataka NEET 2013)*

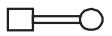
136. A normal-visioned man whose father was colour-blind, marries a woman whose father was also colour-blind. They have their first child as a daughter. What are the chances that this child would be colour-blind?
(a) 100% (b) Zero percent
(c) 25% (d) 50% *(2012)*

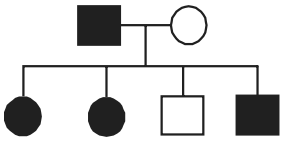
137. Represented here is the inheritance pattern of a certain type of trait in humans. Which one of the following conditions could be an example of this pattern?



(a) Phenylketonuria (b) Sickle cell anaemia
(c) Haemophilia (d) Thalassemia
(Mains 2012)

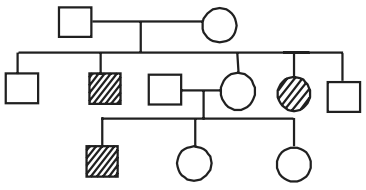
138. Which one of the following conditions correctly describes the manner of determining the sex?
(a) Homozygous sex chromosomes (ZZ) determine female sex in birds.
(b) XO type of sex chromosomes determine male sex in grasshopper.
(c) XO condition in humans as found in Turner's syndrome, determines female sex.
(d) Homozygous sex chromosomes (XX) produce male in *Drosophila*. *(2011)*

139. Which one of the following symbols and its representation, used in human pedigree analysis is correct?
(a)  = Mating between relatives
(b) ○ = Unaffected male
(c) □ = Unaffected female
(d) ◆ = Male affected *(2010)*

140. Study the pedigree chart of a certain family given below and select the correct conclusion which can be drawn for the character.

(a) The female parent is heterozygous.
(b) The parents could not have had a normal daughter for this character.
(c) The trait under study could not be colour blindness.
(d) The male parent is homozygous dominant.
(Mains 2010)

141. Select the incorrect statement from the following.
(a) Galactosemia is an inborn error of metabolism.
(b) Small population size results in random genetic drift in a population.
(c) Baldness is a sex-limited trait.
(d) Linkage is an exception to the principle of independent assortment in heredity. *(2009)*

142. Sickle-cell anaemia is
(a) caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
(b) caused by a change in a single base pair of DNA
(c) characterized by elongated sickle like RBCs with a nucleus
(d) an autosomal linked dominant trait. *(2009)*

143. Study the pedigree chart given below. What does it show?

(a) Inheritance of a condition like phenylketonuria as an autosomal recessive trait.
(b) The pedigree chart is wrong as this is not possible.
(c) Inheritance of a recessive sex-linked disease like haemophilia.
(d) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria. *(2009)*

144. Which one of the following conditions in humans is correctly matched with its chromosomal abnormality/linkage?
(a) Erythroblastosis fetalis - X-linked
(b) Down's syndrome - 44 autosomes + XO
(c) Klinefelter's syndrome - 44 autosomes + XXY
(d) Colour blindness - Y-linked *(2008)*

145. Both sickle cell anaemia and Huntington's chorea are
(a) virus-related diseases
(b) bacteria-related diseases
(c) congenital disorders
(d) pollutant-induced disorders. *(2006)*

146. If a colour blind woman marries a normal visioned man, their sons will be
(a) all colour blind
(b) all normal visioned
(c) one-half colour blind and one-half normal
(d) three-fourths colour blind and one-fourth normal. *(2006)*

147. Cri-du-chat syndrome in humans is caused by the
(a) trisomy of 21st chromosome
(b) fertilisation of an XX egg by a normal Y-bearing sperm
(c) loss of half of the short arm of chromosome 5
(d) loss of half of the long arm of chromosome 5.
(2006)

148. Sickle cell anaemia has not been eliminated from the African population because
(a) it is controlled by dominant genes
(b) it is controlled by recessive genes
(c) it is not a fatal disease
(d) it provides immunity against malaria. *(2006)*

149. A man and a woman, who do not show any apparent signs of a certain inherited disease, have seven children (2 daughters and 5 sons). Three of the sons suffer from the given disease but none of the daughters affected. Which of the following mode of inheritance do you suggest for this disease?
(a) Sex-linked dominant
(b) Sex-linked recessive
(c) Sex-limited recessive
(d) Autosomal dominant *(2005)*

150. A woman with 47 chromosomes due to three copies of chromosome 21 is characterised by
(a) superfemaleness (b) triploidy
(c) Turner's syndrome (d) Down's syndrome.
(2005)

151. Haemophilia is more commonly seen in human males than in human females because
(a) a greater proportion of girls die in infancy
(b) this disease is due to a Y-linked recessive mutation
(c) this disease is due to an X-linked recessive mutation
(d) this disease is due to an X-linked dominant mutation. *(2005)*

152. Which of the following is not a hereditary disease?
(a) Cystic fibrosis (b) Thalassaemia
(c) Haemophilia (d) Cretinism *(2005)*

153. A woman with normal vision, but whose father was colour blind, marries a colour blind man. Suppose that the fourth child of this couple was a boy. This boy
(a) may be colour blind or may be of normal vision
(b) must be colour blind
(c) must have normal colour vision
(d) will be partially colour blind since he is heterozygous for the colour blind mutant allele. *(2005)*

154. A male human is heterozygous for autosomal genes A and B and is also hemizygous for haemophilic gene *h*. What proportion of his sperms will be abh?
(a) 1/8 (b) 1/32
(c) 1/16 (d) 1/4 *(2004)*

155. A normal woman, whose father was colour-blind is married to a normal man. The sons would be
(a) 75% colour-blind (b) 50% colour-blind
(c) all normal (d) all colour-blind. *(2004)*

156. The recessive genes located on X-chromosome humans are always
(a) lethal (b) sub-lethal
(c) expressed in males (d) expressed in females. *(2004)*

157. Pattern baldness, moustaches and beard in human males are examples of
(a) sex linked traits
(b) sex limited traits
(c) sex influenced traits
(d) sex determining traits. *(2003)*

158. Which one of the following conditions though harmful in itself, is also potential saviour from a mosquito borne infectious disease?
(a) Thalassaemia
(b) Sickle cell anaemia
(c) Pernicious anaemia
(d) Leukaemia *(2003)*

159. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?
(a) 100 % (b) 75 %
(c) 50 % (d) 25 % *(2003)*

160. Christmas disease is another name for
(a) haemophilia B (b) hepatitis B
(c) Down's syndrome (d) sleeping sickness. *(2003)*

161. A diseased man marries a normal woman. They get three daughters and five sons. All the daughters were diseased and sons were normal. The gene of this disease is
(a) sex linked dominant (b) sex linked recessive
(c) sex limited character (d) autosomal dominant. *(2002)*

162. Which of the following is a correct match?
(a) Down's syndrome - 21st chromosome
(b) Sickle cell anaemia - X-chromosome
(c) Haemophilia - Y-chromosome
(d) Parkinson's disease - X and Y chromosome *(2002)*

163. Sickle cell anaemia induce to
(a) change of amino acid in α-chain of haemoglobin
(b) change of amino acid in β-chain of haemoglobin
(c) change of amino acid in both α and β chains of haemoglobin
(d) change of amino acid either α or β chains of haemoglobin. *(2001)*

164. Mongolian Idiocy due to trisomy in 21st chromsome is called
(a) Down's syndrome
(b) Turner's syndrome
(c) Klinefelter's syndrome
(d) Triple X syndrome. *(2000)*

165. In *Drosophila*, the XXY condition leads to femaleness whereas in human beings the same condition leads to Klinefelter's syndrome in male. It proves
(a) in human beings Y chromosome is active in sex determination
(b) Y chromosome is active in sex determination in both human beings and *Drosophila*
(c) in *Drosophila* Y chromosome decides femaleness
(d) Y chromosome of man have genes for syndrome. *(2000)*

166. A marriage between normal visioned man and colour blind woman will produce offspring
(a) colour blind sons and 50% carrier daughter
(b) 50% colourblind sons and 50% carrier daughter
(c) normal males and carrier daughters
(d) colour blind sons and carrier daughters. *(1999)*

167. Haemophilic man marries a normal woman. Their offspring will be
(a) all haemophilic
(b) all boys haemophilic
(c) all girls haemophilic
(d) all normal. *(1999)*

168. A woman with two genes for haemophilia and one gene for colour blindness on one of the 'X' chromosomes marries a normal man. How will the progeny be?
(a) 50% haemophilic colour-blind sons and 50% normal sons.
(b) 50% haemophilic daughters (carrier) and 50% colour blind daughters (carrier).
(c) All sons and daughters haemophilic and colour-blind.
(d) Haemophilic and colour-blind daughters. *(1998)*

169. Mental retardation in man, associated with sex chromosomal abnormality is usually due to
(a) moderate increase in Y complement
(b) large increase in Y complement
(c) reduction in X complement
(d) increase in X complement. *(1998)*

170. Albinism is known to be due to an autosomal recessive mutation. The first child of a couple with normal skin pigmentation was an albino. What is the probability that their second child will also be an albino?
(a) 50% (b) 75%
(c) 100% (d) 25% *(1998)*

171. A person with the sex chromosomes XXY suffers from
(a) gynandromorphism
(b) Klinefelter's syndrome
(c) Down's syndrome
(d) Turner's syndrome. *(1997)*

172. In which of the following diseases, the man has an extra X-chromosome?
(a) Turner's syndrome (b) Klinefelter's syndrome
(c) Down's syndrome (d) Haemophilia *(1996)*

173. A person whose father is colour blind marries a lady whose mother is daughter of a colour blind man. Their children will be
(a) all sons colour blind
(b) some sons normal and some colour blind
(c) all colour blind
(d) all daughters normal. *(1996)*

174. A genetically diseased father (male) marries with a normal female and gives birth to 3 carrier girls and 5 normal sons. It may be which type of genetic disease?
(a) Sex-influenced disease
(b) Blood group inheritance disease
(c) Sex-linked disease
(d) Sex-recessive disease *(1996)*

175. An abnormal human male phenotype involving an extra X-chromosome (XXY) is a case of
(a) Edward's syndrome
(b) Klinefelter's syndrome
(c) intersex
(d) Down's syndrome. *(1995)*

176. The genes, which remain confined to differential region of Y-chromosome, are
(a) autosomal genes (b) holandric genes
(c) completely sex-linked genes
(d) mutant genes. *(1994)*

177. Albinism is a congenital disorder resulting from the lack of which enzyme?
(a) Tyrosinase (b) Xanthine oxidase
(c) Catalase (d) Fructokinase *(1994)*

178. The colour blindness is more likely to occur in males than in females because
(a) the Y-chromosome of males have the genes for distinguishing colours
(b) genes for characters are located on the sex-chromosomes
(c) the trait is dominant in males and recessive in females
(d) none of these. *(1994)*

179. Of both normal parents, the chances of a male child becoming colour blind are
(a) none
(b) possible only when all the four grand parents had normal vision
(c) possible only when father's mother was colour blind
(d) possible only when mother's father was colour blind. *(1993)*

180. Of a normal couple, half the sons are haemophiliac while half the daughters are carriers. The gene is located on
(a) X-chromosome of father
(b) Y-chromosome of father
(c) one X-chromosome of mother
(d) both the X-chromosomes of mother. *(1993)*