TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
I SEMESTER INTERNAL ASSESSMENT II EXAMINATIONS
BIOTECHNOLOGY (PRINCIPLES OF INHERITANCE AND VARIATON) QUESTION BANK

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1. Individuals having dissimilar traits (alleles) on homologous chromosomes are called
a)Heterozygous
b) Homozygous
c) Dominant
d)Recessive

2. An allele is considered dominant
a) When it express in homozygosity
b) When it express even in the presence of alternate allele
c) When it express desirable phenotype
d) Both (b) and (c)

3. Mendel's dihybrid ratio is
a) 1:1:1:1
b) 3:1
c) 9:3:3:1
d) 9:1:1:5

4. Mendel studied seven contrasting characters for his breeding experiment with Pisum sativum, which of the following characters did he not use?
a) Pod shape
b) Leaf shape
c) Plant height
d) Pod color

5. An organism with two identical allele of a gene in a cell is called
a) Heterozygous
b) Homozygous
c) Hybrid
d) Homozygous

6. Which principle of inheritance was not given by Mendel
a)Independent assortment
b) Dominance
c) Purity of gametes
d)Linkage

7. When dominant BB and recessive bb is crossed, the percentage of progeny showing the parental genotype is
a) 0%
b) 25%
c) 50%
d)75%

8. The year 1900AD is highly significant for genetics due to
a)Chromosome theory of heredity
b) Discovery of genes
c) Rediscovery of Mendelism
d)Principle of linkage

9. The process by which the segregation of Mendelian factors takes place is
a)Hybridisation
b)Mitosis
c)Meiosis
d) Fertilisation

10. Which would most probably be the genetic makeup of the parents of a colour blind daughter?
a)Carrier mother and normal father
b) Carrier mother and color blind father
c) Color blind mother and normal father
d)Normal mother and normal father

11. If a heterozygous tall plant is crossed with a homozygous dwarf plant the proportion of dwarf progeny will be
a)25%
b)50%
c)75%
d)100%

12. When two tall plants are crossed 45 tall plants and 14 dwarf plants are obtained.The genotype of parent plants is
a) TT x TT
b) TT x tt
c) Tt x Tt
d) TT x Tt

13.Which of the following is not a dominant character selected by Mendel in Pisum?
a) Yellow pod color
b) Violet flower colour
c) Axillary flowers
d) Yellow seed colour

14. Variation can occur due to
a) Mutations
b) Recombination
c) Fertilisation
d) All of these

15. Who discovered the phenomenon of incomplete dominance in Mirabilis and Antirrhinum?
a) De Vries
b) Bateson
c) Carl Correns

d) Davenport

16. How many types of gametes are produced by a trihybrid?
a) 3
b) 4
c) 8
d) 16

17. A dihybrid heterozygous tall plant with round seed is crossed with a similar genotype, what percentage of plants should posses Tt Rr genotype?
a) 6.25%
b) 12.5%
c) 25%
d) 75%

18. A cross by changing the source of ovum is
a) Back cross
b) Test cross
c) Monohybrid
d) Reciprocal cross

19. When the phenotypic and genotypic ratios resemble in the F2 generation it is an example of
a) Independent assortment
b) Qualitative inheritance
c) Segregation
d) Incomplete dominance

20. In what situation, the phenotype of a dihybrid cross would exhibit parental combination of characters in more than the expected value and recombination in less than the expected value?
a) When genes are in mitochondria
b) When duplicate genes are present
c) When genes are linked
d) When supplementary genes are present

21. When the dihybrid Tt rr plants are self-fertilized, what percentage of descendants would be heterozygous for one character and homozygous for another?
a) 25%
b) 50%
c) 75%
d) 100%

22. In a double heterozygous plant, (Eg: Aa Bb) four types of gametes are produced .This illustrate the law of
a) Dominance
b) Segregation
c) Purity of gametes
d) Independent assortment

23. Back cross with recessive parent is called
a) Monohybrid cross
b) Multiple cross
c) Single cross
d) Test cross

24. If a gene has multiple effects, it is called
a) Multiple allelism
b) Pleiotropism
c) Polygeny
d) Epistasis

25. Maize has 10 pairs of chromosomes. How many linkage groups should it possess
a) 5
b) 10
c) 20
d)40

26. Linked genes may be separated by
a) Gene mutation
b) Polyploidy
c) Segregation
d)Crossing over

27. Crossing over in diploid organism is responsible for
a) Recombination of linked gene
b) Segregation of alleles
c) Dominance of genes
d) Linkage between genes

28. Crossing over takes place between
a) Sister chromatids of homologous chromosomes
b) Non sister chromatids of homologous chromosomes
c) Sisters of non-homologous chromosomes
d) DNA and RNA

29. If the distance between genes on a chromosome is more , the linkage strength is
a) More
b) Less
c) Unaffected
d) More in somatic cells

30. Drosophila melanogaster has
a) 2 pairs of autosomes and 1 pair of sex chromosomes
b) 3 pairs of autosomes and 1 pair of sex chromosomes
c) 1 pair of autosomes and 3 pairs of sex chromosomes
d) 2 pairs of autosomes and 2 pairs of sex chromosomes

31. A trisomic individual has a chromosomal number of
a) 2n -1
b) 2n +2
c) 2n + 1
d) 2n + 3

32. Among the following which one is the best chemical for inducing the polyploidy?
a) Ethylene
b) Colchicine
c) Acridines
d) Mustard gas

33. Down's syndrome is an example of
a) Monosomy
b) Trisomy
c) Triploidy
d) Eupolyploidy

34. Which of the following is 6x (hexaploid) wheat?
a) Triticum durum
b) T. monococcum
c) T.aestivum
d) Triticale

35. The holandric genes are located on
a) Mitochondria
b) X- chromosome
c) Y-chromosome
d) Polytene chromosome

36. If the haploid number of chromosomes in a plant is 12,then the number of chromosomes in monosomic is
a) 22
b) 23
c) 25
d) 26

37. Alleles are paired in
a) In zygote
b) In diploid organism
c) Dihybrid
d) All of these

38. Inheritance of flower colour is an example of incomplete dominance, which is seen in:
a) Antirrhinum
b) Pisum
c) Solanum
d) Hibiscus

39. Haemophilia most likely originated as a result of
a) The separation of two homologous chromosomes
b) A non disjunction of chromosome number 21
c) The crossing over to two sex chromosomes
d) A gene mutation in the X- chromosome

40. Chromosome complement with 2n-1 is called as
a) Monosomy
b) Trisomy
c) Nullisomy
d) Tetrasomy

41. The most striking example of point mutation is found in a disease called
a) Night blindness
b) Turners syndrome
c) Down's syndrome
d) Sickle cell anemia

42. In which of the following, females are heterogametic
A) Humans
b) Grasshopper
c) Drosophila
d) Fowl

43. Gynaecomastia is a common feature seen in:
a) Down's syndrome
b) Turner's syndrome
c) Cystic fibrosis
d) Klinefelter's syndrome

44. XO type of sex determination is seen in:
a) Man
b) Grasshopper
c) Drosophila
d) Birds

45. Which of the following is not a Mendelian disorder?
a) Haemophilia
b) Cystic fibrosis
c) Thalesemia
d) Turner's syndrome

46. How many type of phenotypes possible for ABO blood group
a) 2
b) 3
c) 4
d) 1

47. A person affected with phenylketonuria , lacks an enzyme that converts the amino acid phenylalanine into
a) Valine
b) Proline
c) Histidine
d) Tyrosine

48. Haemophilia in man is due to
a) Sex-linked inheritance
b) Sex-limited inheritance
c) Sex-influenced inheritance
d) Primary non-disjunction

49. In XO type of sex determination
a) Females produce two different types of gametes
b) Males produce two different types of gametes
c) Females produce gametes with Y chromosome
d) Males produce single type of gametes

50. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance?
a) Factors occur in pairs
b) The discrete unit controlling a particular character is called a factor
c) Out of one pair of factors one is dominant , and the other recessive
d) Alleles do not show any blending and both the characters recover as such in F2 generation

51. The genotype of a plant showing the dominant phenotype can be determined by :
a) Back cross
b) Test cross
c) Dihybrid cross
d) Pedigree analysis

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

53. F2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1:2:1. It represents a case of
a) Monohybrid cross with complete dominanace
b) Monohybrid cross with incomplete dominance
c) Co-dominance
d) Dihybrid cross

54. Alleles which can express only in pair with similar allele is
a) Dominant
b) Recessive

c) Co dominant
d) Lethal

55. Among the following traits that Mendel studied , choose the recessive one
a) Yellow pods
b) Axile flower
c) Terminal flower
d) Green seed

56.When a dominant 'AA' and a recessive 'aa' are crossed percentage of the progenies showing the parental genotypes will be
a) 0%
b)25%
c)50%
d) 100%

57. A normal visioned man whose father was colour blind ,marries a women whose father is also colour blind . They have their first child as a daughter . What are the chances that this child would be colour blind?
a) 25%
b) 50%
c)100%
d)0%

58. The incorrect statement with regard to Haemophilia is
a)It is sex linked disease
b) It is a recessive disease
c) It is a dominant disease
d) A single protein involved in the clotting of blood is affected

59. Person with blood group AB is considered as universal recipient because he has
a) Both A and B antibodies in the plasma
b) No antigen on RBC and no antibody in the plasma
c) Both A and B antigens in the plasma but no antibodies in the plasma
d) Both A and B antigens on RBC but no antibodies in the plasma

60. A patient with unknown blood group needs immediate blood transfusion. The group that can be donated will be
a) Blood group O
b) Blood group AB
c) Blood group A
d) Blood group B

61. Which Mendelian idea is depicted by a cross in which the F1 generation resembles both parents
a) Incomplete dominance
b) Inheritance of 1 gene
c) Co-dominance
d) Multiple allelism

62. An F2 hybrid generation will have
a) 4 types of genotypes
b) 7 types of genotypes
c) 9 types of genotypes
d) 16 types of genotypes

63. Who among the following is not concerned with re-discovery of Mendelism
a) Von Tschermak
b) Carl Correns
c) Theodre Bovery
d) Hugode Vries

64. The diploid number of drosophila melanogaster
a) 4
b) 8
c) 16
d) 12

65. Linkage phenomenon explained first by
a) William Batson
b) T.H.Morgan
c) Alfsed Sturtevent
d) Johanson

66. Who put forward the crossing theory of recombination
a) Gregor Mendel
b) Wiliam Bateson
c) Janssen
d) T.H.Morgan

67. In honeybees
a) The males have only one set of chromosomes
b) The males have single sex chromosomes
c) Males produce projeny by parthenogenesis
d) Both (a) and (c)

68. First child of a normal couple is phenylketouric. The probability of second male child is affected will be
a) 0%
b) 25%
c) 50%
d) 100%

69. Mutation of any single gene maybe
a) Micromutation
b) Point mutation
c) Gene mutation
d) All of these

70. A normal man whose father was haemophilic marries a women whose father was haemophilic. They have their first child as daughter. What is the chance that this could be
a) 25%
b) 50%
c) 0%
d) 100%

71. Thallasemia beta is located on
a) 11th chromosome
b) 16th chromosome
c)9th chromosome
d) 12th chromosome

72. Choose the sex influenced trait
a) Ovary in female
b) Hypertrichosis
c) Haemophilia
d) Pattern baldness

73. Clotting factors VIII is absent in
a) Haemophilia A
b) Haemophiia B
c) Thalassamia beta
d) Both (a) and (b)

74. Pedigree analysis is useful for
a) Study of inheritance when arranged mating is not possible
b) Study of sex linked inheritance in man
c) Study of Mendelian disorders in man
d) All of these

75. Choose the incorrect statement regarding haemophilia
a) It is x –linked
b) It is dominant in male
c) it inherit from father to daughter
d) A single protein in cascade of several protiens involved in clotting is affected

76. Choose the wrong statement
a) Mental retardation can be the effect of phenyl pyruvic acid
b) Thallasemia is a quantitative problem
c) Sickle cell anemia person produce abnormal Hb
d) Cystic fibrosis is quantitative

77. Which of the following cannot be detected in developing foetus by amniocentesis /
a) Klinefelter syndrome
b) Sex of the foetus
c) Down syndrome
d) Jaundice

78. Which mendelian idea is depicted by a cross in which the F1 generation resembles both the parents?
a) Incomplete dominance
b) Law of dominance
c) Inheritance of one gene
d) Co- dominance

79. If both parents are carriers of thalassemia , which is an autosomal recessive disorder , what are the chance of pregnancy resulting in an affected child?
a) No chance
b) 50%
c) 25%
d)100%

80. A human female with Turner's syndrome
a) Has one additional X chromosome
b) Exhibits male characters
c) Is able to produce children with normal husband
d) Has 45 chromosomes with XO

81. Which of the following cannot be expected on the basis of Mendel's law of dominance
a) It explains the expression of one of the parental traits in F 1
b) It explain expression of both traits in F 2
c) It explains the 3:1 ratio in F 2
d) It explains the formation of functional enzyme by dominant allele

82. When heterozygous yellow round seed plants and self-fertilized, the frequency of occurrence of RrYY genotype among the offspring's is
a) 1/16
b) 3/16
c) 2/16
d) 4/16

83. A person homozygous for autosomal loci 'a' and 'b' and heterozygous for gene 'p' shall produce how many types of gametes in respect of these loci
a) 1 type
b) 2 types
c) 3 types
d) 4 types

84. Experimental proof for chromosome theory of inheritance is given by
a) Sutton
b) Sutton and Bovery
c) T H Morgan
d) Sturtevent

85. The nuclear structure observed by Henking in 50% of the sperms in the testes of a insect was termed
a) X-body

b) Bar body
c) Polar body
d) Chromatin

86. First artificial mutation was induced in
a) Barley
b) Maize
c) Drosophila
d) Neurospora

87. Hemophilic person marries a girl having no history of the disease in her pedigree. What is the chance that a haemophilic child is born to them
a) 0%
b) 25%
c) 50%
d) 75%

ANSWER KEY

Q	A	Q	A	Q	A	Q	A
1	C	2	B	3	D	4	C
5	B	6	B	7	B	8	A
9	C	10	A	11	B	12	C
13	C	14	C	15	D	16	B
17	C	18	D	19	B	20	A
21	D	22	D	23	D	24	B
25	B	26	C	27	B	28	B
29	B	30	D	31	B	32	A
33	B	34	C	35	B	36	B
37	C	38	C	39	D	40	D
41	D	42	A	43	D	44	A
45	D	46	D	47	A	48	D
49	B	50	B	51	D	52	B
53	B	54	D	55	B	56	D
57	B	58	D	59	D	60	C
61	C	62	D	63	D	64	B
65	A	66	A	67	D	68	A
69	C	70	C	71	A	72	C
73	C	74	A	75	C	76	C
77	C	78	C	79	B	80	B
81	B	82	A	83	B	84	D
85	C	86	C	87	A		

Short Answers

1. What is law of dominance?
2. What is law of Independent assortment?
3. What is linkage?
4. What are multiple alleles?
5. What is epistasis?