BIOLOGY

BOOKS - MODERN PUBLICATION

HEREDITY AND VARIATION

Exercise

1. Fill in the blanks:-

Mendelian factors which determine the character of diploid organism is called_____.

A. Phenotype

B. Genotype

C. Recessive

D. Dominant

Answer: A

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2. The process of transmission of characters through generations is known as $\underline{\text{variation}}$

A. Variation

B. Segregation

C. Migration

D. Heredity

Answer: D

3. What is the scientific name of the plant with which Mendel worked?

A. Oenothera lamarckiana

B. Oenothera mendeliana

C. Pisum sativum

D. Oryza sativa

Answer: C

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4. When a hybrid tall pea plant is cross fertilized with a dwarf pea plant , the ratio of

tall is to dwarf plants grown from the seeds will be :

A. 0.12569444444444

B. 0.084027777777778

C. 0.04375

D. 0.042361111111111

Answer: D

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5. What are the gene pair signifying a trait called?

A. Hybrid

B. Phenotype

C. Pure-line

D. Alleles

Answer: D

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6. Who postulated the law of inheritance ?

A. Lamarck

B. Darwin

C. Mendel

D. Haeckel

Answer: C

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7. When heterozygous round seeded plant is crossed with a recessive wrinkle seeded plant and round and wrinkle phenotypes will appear in F_1 in the ratio :

A. 0.043055555555556

B. 0.084027777777778

C. 0.042361111111111

D. 0.12569444444444

Answer: C

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8. What was the phenotypic ratio in F_2 of mendelian . monohybrid cross?

A. 0.042361111111111

B. 0.084027777777778

C. 0.12569444444444

D. 9:3:3:1

Answer: C

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9. What is the genotypic ratio in F_2 OF Mendelian monohybrid cross?

A. 0.042361111111111

B. 0.125694444444444

C. 0.043055555555556

D. 0.04306712962963

Answer: D

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10. Character that is expressed in hybrid is :

A. Dominant

B. Recessive

C. Multiple

D. None of these

Answer: A

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11. Character that is suppressed in heterozygous state in called :

A. Dominant

B. Recessive

C. Multiple

D. None of these

Answer: B

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12. mendel succeeded in his experiments because:

A. He selected pea plant

B. Independent characters were studied

C. a lot of characters were selected

D. Pea plant is bisexual

Answer: B

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13. In F_2 generation of a monohybrid cross in what ratio the recessive character appears?

A. 1/2

B. 1/4

C. 3/4

D. 1

Answer: B

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14. In a Mendelian hybrid experiment, F_1 plants are :

A. Heterozygous

B. Homozygous

C. Hemizygous

D. Dizygous

Answer: A

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15. The character which predominates and clearly seen in F_1 generation is

A. Intermediate

B. Incomplete

C. Recessive

D. Dominant

Answer: D

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16. The term back cross refers to

A. A cross among F_1 hybrid

B. A cross between F_1 hybrid and either of parents

C. A cross between F_1 and `underset(2)(F) plants

D. None of these

Answer: B

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17. Which of the following ratio represents a test cross ?

A. 0.125694444444444

B. 9:3:3:1

C. 0.04306712962963

D. 1:1:1:1

Answer: D

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18. Phenotypic ratio and genotypic ratio are the same in case of multiple allelism.

A. Dominance

B. Incomplete dominance

C. Test cross

D. Back cross

Answer: B

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19. A gamete contains how many alleles of a gene ?

A. One

B. Two

C. All

D. None

Answer: A

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20. Find out the genotyps (s) of the offspring of the cross AaBb $\times$ aabb

A. AaBb

B. Aabb

C. AaBb and aabb

D. AaBb,Aabb,aaBb and aabb

Answer: D

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21. A cross between AaBB x aaBB produces the offspring with genotypes :

A. 1 AaBB :3aaBB

B. 3 AaBB: 1 aaBB

C. 1 AaBB: 1 aaBB

D. all AaBB

Answer: C

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22. An allele is said to be dominant if it is expressed in :

A. Heterozygous condition only

B. Homozygous condition only

C. Both heterozygous and homozygous conditions

D. Gametes

Answer: C

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23. Precentage of recessive phenotype in a cross between two hybrid is :

A. 0.25

B. 0.5

C. 0.75

D. 1

Answer: A

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24. What will be the percentage of the tall plants with red flower in a cross between TTRr x ttrr, when T stands for tall dominant and R for red dominant ?

A. 0.25

B. 0.5

C. 0.75

D. 1

Answer: B

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25. In humans polygenes are responsible for

A. Alibinism

B. Haemophilia

C. Colour blindness

D. Skin colour

Answer: D

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26. An F_2 genotypic ratio of 1:4:6:4:1 instead of 9:3:3:1 indicates :

A. Qualitative inheritance

B. Quantitative inheritance

C. Incomplete dominance

D. Multiple allelism

Answer: B

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27. Fill in the blank: Organisms phenotypically similar and but genotypically different are called _____.

A. Heterozygotes

B. Homozygotes

C. Monozygotes

D. Multizygotes

Answer: A

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28. In order to find out the different types of gametes produced by a pea plant having the genotypes AaBb , it should be crossed to a plant with genotypes :

A. AABB

B. AaBb

C. AaBb and aabb

D. aaBB

Answer: C

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29. Which of the following is most suitable medium for culture of Drosophila melanogaster ?

A. Cowdung

B. Moist bread

C. Agar agar

D. Ripe banana

Answer: D

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30. In mendel's experiments with garden pea , round seed shape (RR) was dominant over wrinkled seeds (rr) ,yellow cotyledon (YY) was dominant over green cotyledon (yy) . What are the expected phenotypes in the F_2 generation of the cross RRYY x rryy ?

A. Round seeds with yellow cotyledons and wrinkled seeds with yelllow cotyledons

B. Only round seeds with green cotyledons

C. Only wrinkled seeds with yellow cotyledons

D. Only wrinkled seeds with green cotyledons

Answer: A

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31. Which one of the following pairs of features is a good example of polygenic inheritance ?

A. Human height and skin colour

B. ABO blood group in humans and flower colour of Mirabilis jalapa

C. Hair pigment of mouse and tongue rolling of humans

D. Human eye colour and sickle-cell anaemia

Answer: A

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32. Mating of an organism to a double recessive in order to determine whether it is homozygous or heterozygous for a character under consideration is called :

A. Reciprocal cross

B. Test cross

C. Dihybrid cross

D. Back cross

Answer: B

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33. Two pea plants were subjected for cross pollination . Of the 183 plants produced in the next generation . 94 plants , were found to be tall and 89 plants were found to be dwarf.The genotypes of the two parental plants are likely to be :

A. TT and tt

B. Tt and Tt

C. Tt and tt

D. TT and TT

Answer: C

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34. The F_2 generation offspring in a plant showing incomplete dominance exhibit :

A. Variable genotypic and phenotypic ratios

B. A genotypic ratio of 1:1

C. A phenotypic ratio of 3:1

D. Similar phenotypic and genotypic retios of 1:2:1

Answer: D

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35. Discontinuous variations are :

A. Acquired characters

B. Mutations

C. Essential features

D. Non-essential features

Answer: B

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36. When a hybrid tall pea plant is cross fertilized with a dwarf pea plant , the ratio of tall is to dwarf plants grown from the seeds will be :

A. 0.125694444444444

B. 0.084027777777778

C. 0.04375

D. 0.042361111111111

Answer: D

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37. Law of segregation explains expression of recessive characters in :

A. Parental generation

B. F_1 generation

C. F_2 generation

D. All of these

Answer: B

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38. A cross between a organism with dominant phenotype and a homozygous recessive to know the genotype of former is called :

A. Back cross

B. Test cross

C. Reciprocal cross

D. Monohybrid cross

Answer: B

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39. After a cross of tall plant and dwarf plant,in F_1 generation ratio of tall : dwarf is 50 : 50. What are the genotypes of parents ?

A. Tall heterozygous, dwarf homozygous

B. Both homozygous

C. Both heterozygous

D. Dwarf heterozygous, tall homozygous

Answer: A

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40. A pair of contrasting characteristics is called :

A. Phenotype

B. Genotype

C. Allele

D. Gene

Answer: C

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41. A couple with blood groups A and B may have children with blood group :

A. A and B only

B. A,B and AB

C. A,B,AB and O

D. AB only

Answer: C

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42. Which of the following ratio represents a test cross ?

A. 0.12569444444444

B. 9:3:3:1

C. 0.04306712962963

D. 1:1:1:1

Answer: D

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43. An F_2 genotypic ratio of 1:4:6:4:1 instead of 9:3:3:1 indicates :

A. Monogenic

B. Qualitative

C. Quantitative

D. Incomplete

Answer: C

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44. Which term was used by mendel to represent hereditary unit ?

A. Gene

B. Allele

C. Factor

D. Elemente

Answer: D

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45. Right - handedness is dominant over left-handedness . Most probable gene types

having two right - handed parents , a left handed child are

A. RR XX RR

B. RR XX Rr

C. Rr xx Rr

D. All of these

Answer: C

46. What types of genotypes are expected when a plant with AABb genotypes is self-pollinated ?

A. 3 AABB : 1AABb

B. 3 AABb:1 Aabb

C. 1 AABB: 1 Aabb

D. 1 AABB : 2 AABb : 1 Aabb

Answer: D

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47. Which one of the following is an example of polygenic inheritance?

A. Skin colour in humans

B. Flower colour in Mirabilis jalapa

C. Production of male honeybee

D. Pod shape in garden pea

Answer: A

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48. How many different kinds of gametes will be produced by a plant having the genotype AABbCC ?

A. Two

B. Three

C. Four

D. Nine

Answer: A

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49. Test cross is a cross between :

A. Crossing between two genotypes with dominant traits

B. Crossing between two genotypes with recessive traits

C. Crossing between two F_1 hybrids

D. Crossing the F_1 hybrid with a double recessive genotype

Answer: D

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50. A pure tall and a pure dwarf plant were crossed to produced offsprings . Offsprings were self crossed then find out the ratio between true breeding tall to true breeding dwarf ?

A. 0.042361111111111

B. 0.125694444444444

C. 0.084027777777778

D. 0.04306712962963

Answer: A

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51. Genetics tern was proposed by

A. Mendel

B. Bateson

C. Morgan

D. Johannson

Answer: B

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52. Mother homozygous B,and father is A. What will be the possible blood group in their progeny ?

A. AB & B possible

B. AB & A possible

C. A and B possible

D. O possible

Answer: A

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53. In ABO blood groups, how many phenotypes are found ?

A. 6

B. 8

C. 1

D. 4

Answer: D

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54. When a tall plant with round seeds (TTRR) crossed with a dwarf plant with wrinkled seeds (ttrr) , the F_1 generation consists of tall plant with round seeds . What would be the proportion of dwarf plant with wrinkled seeds in F_1 -generation ?

A. 0.25

B. (1/16)

C. 0

D. (1/2)

Answer: C

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55. In man , the blue eye colour is recessive to the brown eye colour . If the boy has brown eye and his mother is blue eyed, what would be the phenotype of his father ?

A. black eye

B. Brown eye

C. Green eye

D. Blue eye

Answer: B

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56. A common test to find the genotype of a hybrid is by:

A. crossing of one F_2 progeny with female parent

B. Studying the sexual behaviour of F_1 progenies

C. Crossing of one F_1 progeny with male parent

D. Crossing of one F_2 progeny with male parent

Answer: C

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57. Inheritances of skin colour in human is an example of:

A. Point mutation

B. Polygenic inheritance

C. Codominance

D. Chromosomal aberration

Answer: B

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58. In pea plants , yellow seeds are dominant to green . If a heterozygous yellow seeded plant is crossed with a green seeded plant , what ratio of yellow and green seeded plants would you expect in F_1 - generation ?

A. 0.375694444444444

B. 0.04375

C. 0.125694444444444

D. 2.1180555555556

Answer: D

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59. The offsprings of mating between two pure strains are called as:

A. heterosis

B. hybrid

C. progeny

D. cybrid

Answer: B

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60. G.Mendal used the plant:

A. Oenothera lamarckiana

B. Lathyrus sativus

C. Mirabilis jalapa

D. Pisum sativum

Answer: D

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61. Organism with two different allele is:

A. Heterozygous and homozygous

B. Heterozygous for the allele

C. Homozygous

D. None of these

Answer: D

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62. Which blood group person can donate the blood to all other person ?

A. A

B. B

C. AB

D. O

Answer: D

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63. A dihybrid test cross yielding a result of 1: 1: 1: 1 ratio is indicative of :

A. 4 different types of gametes produced by the $\underset{1}{F}$ dihybrid

B. Homozygous condition of the $\underset{1}{F}$ dihybnrid

C. 4 different types of $\underset{2}{F}$ generation dihybrids

D. 4 different types of gametes produced by the $underser(1)(P)$ parent

Answer: A

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64. Indicate, the inheritance of which of the following is controlled by multiple alleles :

A. colour blindness

B. sickle cell anaemia

C. blood group

D. phenylketoneuria

Answer: C

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65. How many types of gametes are obtained from a plant of genotype TTRr?

A. one

B. two

C. four

D. many

Answer: B

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66. In a cross between a pure tall pea plant with green and a pure short plant with yellow pod,how many short plants out of 16,you would expect in F_2 generation .

A. 3

B. 9

C. 4

D. 1

Answer: C

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67. In humans, height shows a lot of variation, it is an example of:

A. multiple alleles

B. pleiotropic inheritance

C. polygenic inheritance

D. pseudoalleles

Answer: C

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68. Inheritance of blood group is a condition of:

(A) Co-dominance

(B) Incomplete dominance

,(C)Multiple allelism

(D) Multiple gene

A. A,B

B. B,D

C. B,C

D. A,D

Answer:

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69. Choose the correct answer from the choices given under each bit/Correct the underlined portion of the sentences.

Which one of the following represents a test cross?

A. $Ww \times WW$

B. $Ww \times Ww$

C. $Ww \times ww$

D. $WW \times WW$

Answer: C

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70. The term genome denotes :

A. haploid set of chromosome

B. bivalent

C. monovalent

D. diploid chromosome

Answer: A

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71. Test cross is a cross between :

A. hybrid xx dominant parent

B. hybrid xx recessive parent

C. hybrid xx hybrid parent

D. two distantly related species

Answer: B

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72. Mendel's principle of segregation means that the germ cells always recived :

A. one pair of alleles

B. one quarter of the genes

C. one of the paired alleles

D. any pair of alleles

Answer: C

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73. All the genes contained in a haploid uncleus is called as :

A. gene pool

B. allele

C. genome

D. operon

Answer: C

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74. Inheritance of flower colour is an example of incomplete dominance , which is seen in :

A. Antirrhinum

B. Pisum

C. Solanum

D. Hibiscus

Answer: A

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75. When red blood corpuscles containing both A and B antigens are mixed with your blood serum, they agglutinate. Hence your blood grop is _____ type.

A. AB

B. O

C. A

D. B

Answer: B

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76. A cross in which an organism showing a dominant phenotype is crossed with the recessive parent in order to know its genotype is colled :

A. monohybrid

B. back cross

C. Test cross

D. dihybrid cros

Answer: C

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77. Heterozygosity of F_1 hybrids can be determined by:

A. Back cross

B. Test cross

C. Reciprocal cross

D. hybrid cross

Answer: B

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78. Heterozygous tall plant (Tt)is crossed with homozygous dwarf (tt) plant. The what will be the percentage of dwarf plants in the next generation ?

A. 0

B. 0.5

C. 0.25

D. 1

Answer: B

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79. If a cross between two individuals produce offspring with 50% dominant character (A) and 50% recessive character (a) the genotype of parents are:

A. Aa xx Aa

B. Aa xx aa

C. AA xx aa

D. AA xx Aa

Answer: B

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80. If F_1 generation has all tall progenies and ratio of F_2 generation is 3:1 (tall :dwarf) then it proves

A. law of independent assortment

B. law of segregation

C. law of dominance

D. incomplete dominance

Answer: B

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81. The behavior of the chromosomes was parallel to the behavior of genes during meiosis was noted by

A. Correns

B. Sutton and Boveri

C. de Vries

D. Henking

Answer: B

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82. Which of the folowing is the number of alleles for blood group in an individual ?

A. 1

B. 2

C. 3

D. 4

Answer: C

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83. In an organism, tall phenotype is dominant over recessive dwarf phenotype, and the alleles are designated as T and t respectively. Upon crossing two different individuals, total

250 offsprings were obtained, out of which 125 displayed tall phenotype and rest were dwarf. Thus, the genotype of the parents were

A. TT xx TT

B. TT xx tt

C. Tt xx Tt

D. Tt xx tt

Answer: D

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84. In a monohybrid cross between two heterozygous individual, the number of pure homozygous individuals obtained in F_1 generation is

A. 2

B. 4

C. 6

D. 8

Answer: A

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85. F_2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are some as 1 : 2 : 1. It represents a case of

A. co-dominance

B. dihybrid cross

C. monohybrid cross with complete dominance

D. Monohybrid cross with incomplete dominance

Answer: D

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