AAS-003-006205 Seat No. _____

First Year B. Sc. (Bioinformatics) (Sem. II) (CBCS) Examination

April / May – 2016

BI-205 : Molecular & Developmental Genetics

Faculty Code : 003
Subject Code : 006205

Time : Hours] [Total Marks :

SECTION - I

M.C.Q.

(1) Which of the following statement represents the criteria that DNA is the genetic material ?

(A) It is found in small amounts in cell.

(B) It is complex structural entity.

(C) It is essentially stable and is transmitted through generations to generations

(D) It is a special biomolecule

(2) Griffiths experimented to show

(A) Transmission

(B) Transformation

(C) Conjugation

(D) Transduction

(3) What is the contribution of T. Avery, C.M. Macleod and M. Mc Carthy?

(A) Carried a new set of experiments to show that DNA is the genetic material

(B) Repeated Griffiths

(C) Experimented to show that DNA undergoes mutation

(D) Worked out the Biosynthesis of DNA

(4) Consider the cross between Dominant Homozygous RR and Recessive homozygous rr gene coding for any protein then progeny will have which of the following genotype comination ?

(A) RRRR

(B) RRrr

(C) Rr

(D) None of these

(5) Refer to the following genetics cross: Line A is a true-breeding line of white-flowered snapdragons. Line B is a true-breeding line of red-flowered snapdragons. A plant from line A is crossed to a plant from line B. The resulting F1 offspring are all pink flowered. The F1 fertilize each other. The F2 have red, white, and pink flowers. What proportion of the F2 would you expect to be white-flowered?

(A) 9/16

(B) 1/4

(C) 100%

(D) 0%

(6) When Gregor Mendel crossed a tall plant with a short plant, the F1 plants inherited

(A) an allele for tallness from each parent

(B) An allele for tallness from the tall parent and an allele for shortness from the short parent.

(C) An allele for shortness from each parent.

(D) An allele from only the tall parent.

(7) The principle of dominance states that

(A) all alleles are dominant

(B) all alleles are recessive

(C) some alleles are dominant, and others are recessive.

(D) alleles are neither dominant nor recessive

(8) The probability that a male inherited his Y chromosome from his maternal grandfather is

(A) 0%

(B) 25%

(C) 50%

(D) 100%

(9) The substances, chemical physical or biological, which brings about mutation, are called as

(A) Mutagens

(B) Mutators

(C) Mutagenetic

(D) Transumutators

(10) Which of the following is a base analogue ?

(A) Nitrous acid

(B) EMS

(C) 5-bromouracil

(D) Hydrazine

(11) The following is not the method of gene transfer

(A) Transduction

(B) Linkage

(C) Transformation

(D) Conjugation

(12) _____ involves the nearly random transfer of the bacterial DNA along with the viral DNA to the recipient cells

(A) Specialized Transduction

(B) Sexduction

(C) Generalized Transduction

(D) none of the above

(13) The process of exchange of genetic material within homologous chromosomes

(A) Transduction

(B) Transformation

(C) Crossing Over

(D) both (A) and (B)

(14) Which of the following mutagen causes formation of thymine dimers?

(A) X-rays

(B) UV rays

(C) 5 Brorno uracil

(D) None of the above

(15) Drosophila body contains overall _____ segments

(A) 11

(B) 12

(C) 13

(D) 14

(16) In humans, the dominance relationship between the A and B alleles of the ABO blood group gene is an example of

(A) complete dominance.

(B) incomplete dominance

(C) codominance

(D) epistasis

(17) Frameshift mutation causes

(A) Change of Reading frame

(B) May change the amino acid sequence

(C) Both (A) and (B)

(D) None of the above

(18) HOX genes are playing an important role in

(A) Segmentation of the Drosophila

(B) For the formation of wings

(C) Determining Eye colour

(D) None of these

(19) Metamorphosis is the

(A) Process of transforming from larva to adult stage

(B) Causing mutation in the drosophila

(C) Type of DNA transfer

(D) None of the above

(20) A nonsense mutation involves

(A) A regulatory sequence.

(B) an AG splice acceptor site

(C) The creation of a different amino acids.

(D) the creation of a stop codon

SECTION - II

1 (A) Answer any three of the following : **2×3=6**

(1) Explain the dominance of the gene

(2) Describe what is a homozygous parent with example.

(3) What is redundancy?

(4) Define epistasis.

(5) Define gene.

(6) What is sex limited inheritance.

(B) Answer any three of the following : **3×3=9**

(1) Explain Sex determination

(2) Explain the factors to be kept in mind while analysing the extra-chromosomal inheritance.

(3) Explain incomplete dominance in Mirabilis jalapa.

(4) Write a note on crossing over.

(5) Explain Avery, Mc Cloed, Mccarty experiment.

(6) Explain gene interactions.

(C) Answer any two of the following : **5×2=10**

(1) Explain the experiments performed to identify DNA as the genetic material

(2) Write details on Transduction

(3) Explain Mutagenesis by physical mutagen.

(4) Explain the laws of mendelian inheritance

(5) Explain Linkage with its types and examples.

2 (A) Answer any three of the following : **2×3=6**

(1) Explain the law of segregation

(2) What is sexduction ?

(3) Define incomplete dominance

(4) What is back cross?

(5) What is co-dominance?

(6) What are body axes ?

(B) Answer any three of the following : **3×3=9**

(1) Write a note on transformation.

(2) What is Recombinant DNA technology?

(3) State law of independent assortment with example.

(4) Explain the Hardy-Weinberg equilibrium

(5) Explain gene and genotypic frequencies

(6) Explain the segmentation genes.

(C) Answer any two of the following : **5×2=10**

(1) Explain the Sex-linked inheritance.

(2) Write a note on viral life cycle.

(3) Explain the Extrachromosomal inheritance in Mitochondria and Chloroplast.

(4) Explain gene transfer techniques and explain conjugation in detail.

(5) Explain the segmentation and homeotic genes of Drosophila.
