(1)

54107

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Model Answer Key **S.Y.B.Sc Zoology P-I Semester-III (CBCSGC)** **Q.P.Code:**

Time: 03 Hours Marks: 100

Q.1 A) Fill in the blanks by choosing the correct options given below **05**

i) X linked recessive 01
ii) Lampbrush 01
iii) Cistron 01
iv) DNA 01
v) Stop 01

01

B) Match the columns I and II and rewrite **05**

	Column I		Column II	
i)	Genic balance theory	:	C B Bridges	01
ii)	Mary Lyon	:	Inactivation of X chromosome	01
iii)	Widows peak	:	Dominant trait	01
iv)	Double dominant epistasis	:	15:1 Phenotype ratio	01
v)	Francis Crick	:	Wobble hypothesis	01

C) State whether True or False **05**

i) False 01
ii) True 01
iii) False 01
iv) True 01
v) True 01

01

D) Define the following.

i) **Karyotype** – A complete diploid set of chromosomes of an individual or species is called karyotype. **05** 01

ii) **Intersex** – Intersexes are those who don't fit in the typical notions of male and female bodies. 01

iii) **Back Cross** – The cross of F1 Hybrids to one of its parents is called back cross. 01

iv) **Wild type allele** – The allele that encodes the most common phenotype in a particular natural population is known as 'Wild Type Allele'. 01

v) **Define the terms codon and anticodon.** 01

A **codon** is found on the coding strand of double-stranded DNA and in the (single-stranded) mRNA. It is complementary to a triplet of template strand and determines the position of an amino acid in a polypeptide chain.

The **anticodon** is found on the tRNA and is the part that is complementary to and base-pairs with the **codon** on the mRNA in order to bring the appropriate amino acid to the ribosome to be added to the growing polypeptide chain.

(3)

Q.2	A)	Answer **any one** of the following:	**10**
	i)	**Multiple Alleles wrt. Coat color in rabbit.**	**10**
	1	Introduction and Definition of multiple alleles	02
	2	Illustration	04
	3	Explanation	04
	ii)	**Epistasis and Double Dominant Epistasis**	**10**
	1	Introduction and Definition of Epistasis	02
	2	Illustration for double dominant epistasis	03
	3	Explanation of double dominant epistasis	05
	B)	Answer **any two** of the following:	**10**
	i)	**Classical concept of gene**	**05**
	1	Introduction	1.5
	2	Explanation	3.5
	ii)	**Lethal Alleles**	**05**
	1	Introduction	1.5
	2	Explanation with illustration	3.5
	iii)	**Polygenic Inheritance**	**05**
	1	Introduction	1.5
	2	Explanation with illustration	3.5
	iv)	**Complete linkage**	**05**
	1	Introduction	1.5
	2	Explanation with illustration	3.5
Q.3	A)	Answer **any one** of the following	**10**
	i)	**Classification of chromosome based on the position of the centromere**	**10**
	1	Brief description of metacentric, sub-metacentric, acrocentric and telocentric chromosomes	06
	2	Diagram	04
	ii)	**Inheritance pattern of colour blindness in man**	**10**
	1	Introduction	02
	2	Description	04
	3	Schematic representation of pattern of inheritance of colour blindness	04
	B)	Answer **any two** of the following:	**10**
	i)	**Polytene chromosomes**	**05**
	1	Definition & Description	04

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	2	Diagram	01
	ii)	**Parthenogenesis**	**05**
	1	Definition	01
	2	Description with examples	04
	iii)	**Autosomes**	**05**
	1	Definition	01
	2	Description	04
	iv)	**Role of environment in sex determination**	**05**
	1	Brief description on sex determination in *Bonellia*	2.5
	2	Brief description on sex determination in Crocodile	2.5
Q.4	A)	Answer **any one** of the following:	**10**
	i)	**"DNA replication is bidirectional and continuous in one strand and discontinuous in another"**	**10**
	1	Introduction	01
	2	DNA replication is bidirectional- Explanation with diagram	03
	3	Continuous in one strand- Explanation with diagram –leading strand	03
	4	Discontinuous in another- Explanation with diagram- lagging strand, Okazaki fragments	03
	ii)	**Structure and functions of different types of RNA**	**10**
	1	What is RNA?	01
	2	Description of types(structure with diagram and functions) of:	
		i. mRNA- structure, monocistronic and polycistronic, functions	03
		ii. rRNA	03
		iii.tRNA	03
	B)	Answer **any two** of the following:	**10**
	i)	**Salient features of double helical structure of DNA**	**05**
	1	Description of structure	03
	2	Diagram	02
	ii)	**Types of extranuclear DNA**	**05**
	1	Mitochondrial DNA: Definition, structure, properties, functions, diagram	2.5
	2	Chloroplast DNA: Definition, structure, properties, functions, diagram	2.5
	iii)	**Process of termination of polypeptide synthesis**	**05**
	1	Introduction	01
	2	Description	03
	3	Diagram	01

	iv)	**Griffith's transformation experiments**	**05**
	1	Introduction	01
	2	Description	
		i. Account of Smooth and Rough strains	01
		ii. Steps of experiment	01
		iii. Conclusions	01
	3	Diagram/ Schematic representation	01
Q.5		Write short notes on **any four:**	**20**
	i)	**Monohybrid cross**	**05**
	1	Introduction	01
	2	Explanation with illustration	04
	ii)	**Types of crossing over**	**05**
	1	Somatic Or Mitotic crossing over	01
	2	Germinal or Meiotic crossing over	03
	3	Multiple crossing over	01
	iii)	**ZZ-ZW mechanism of sex determination**	**05**
	1	Description with example(s)	03
	2	Schematic representation	02
	iv)	**Sex influenced genes**	**05**
	1	Definition	01
	2	Description with example(s)	04
	v)	**RNA as a genetic material**	**05**
	1	Introduction: RNA is genetic material in some viruses	01
	2	Conrat and Singer's experiment in TMV , results and conclusion	04
	vi)	**Regulation of Lac operon**	**05**
	1	Definition	01
	2	Description of regulation (Inducible operon-under negative control-mechanism)	04

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