

BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme - Bachelor of Science honours in Biotechnology

Course Name - Genetics

Course Code - BBTC102

(Semester - 1)

Time allotted: 2.5 Hours

Full Marks: 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group -A

(Multiple Choice Type Question)

 $20 \times 1 = 20$

- 1. Choose the correct alternative from the following (Answer any Twenty)
- (i) The genotypic F2 ratio of monohybrid cross is
 - a. 1:1.

b. 1:2:1.

c. 2:1:2

- d. 9:3:3:1.
- In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant (ii) over shortness. If a plant with RRTt genotype is crossed with a plant that is rrtt then
 - a. 25% will be tall withred fruit.
- b. 50% will be tall with red fruit.
- c. 75% will be tall with red fruit. d. All of the offsprings will be tall with red fruit.
- When dominat and recessive alleles express together it is called (iii)
 - a. Codominanance

b. Dominance

c. amphidominance.

- d. pseudodominance.
- Which of the following is test cross? (iv)
 - a. Tt × tt.

b. TT × tt.

c. Tt × Tt.

d. tt × tt.

(v)	When a tall plant with round seeds (TTRR) is crossed with a dwarf plant with wrinkled seeds (ttrr) the F1 generation consist of tall plants with rounded seeds many types of gametes the F1 plant would produce?					
	a.	One.	b.	Three.		
	c.	Four.	d.	Eight.		
(vi)	Term	genetics was coined by				
	a.	Mendel.	b.	Bateson.		
	c.	Morgan.	d.	Johanssen.		
(vii)	Plant	Plant height of Mendel's Pea plant was located in chromosome				
	a.	1	b.	5		
	c.	7	d.	4		
(viii)		What will be possible blood group in children from the parents with B and AB blood groups?				
	a.	A,O.	b.	A, B, AB and O.		
	c.	A, B and AB	d.	B and O.		
(ix) Which of the following is not an example of model organism?				odel organism?		
	a.	Arabidopsis	b.	Coenorabdhitis elegans		
	c.	Ficus	d.	Mouse		
(x)	(x) Which of the following example of model organism best used as in develop biology?			nism best used as in development		
	a.	Zebrafish	b.	Mouse		
	c.	Rat	d.	Dictyostelium		
(xi)	How many types of zygotic combination are possible between a cross AaBBCcDd × AAbbCcDD?					
	a.	32	b.	128		
	c.	64	d.	16		
(xii)	Which one of the following is not an example of non allelic interection					
	a.	Epistatis	b.	Complimentory gene interection		
	c.	inhibitory gene interection	d.	incomplete dominance		
(xiii)	Sickle	cell anaemia is an example of				
	a.	Dominance	b.	Dominance and incomplete		
				dominance		
	c.	Dominance and incomplete	d.	Dominance and incomplete		
		dominance and codominance		dominance and codominance and		
				multiple allele		

(xiv)	The linkage map of X-chromosome of fruitfly has 66 units, with yellow body gene (y) at one end and bilobed hair (b) gene at the other end. The recombination frequency between these two gene (y and b) should be.					
	a.	66%	b.	> 50%		
	c.	Less than equal to 50%	d.	100%		
(xv)		of th efollowing disease is an exam	ple c	of autosomal dominant		
` '	a.	Hutchinson's disease.		Fused ear lobes.		
	c.	Tay sach's disease	d.	Sickle cell disease		
(xvi)	Which of the following statements are correct wrt Turner's syndrome?					
	a.	Example of trisomy.	b.	Formed due to fusion of normal sperms (22 + XY) and abnormal egg (22 + 0) or normal egg (22+ XX) and abnormal sperms (22 + 0).		
	c.	Females are not sterile.	d.	Example of aneuploidy.		
(xvii) Protein subunit found within microtubules is						
	a.	Collagen.	b.	Tubulin.		
	c.	Myosin.	d.	DNA		
(xviii)	Small	est phase of mitosis is				
	a.	Prophase.	b.	Metaphase.		
	c.	Anaphase.	d.	Telophase.		
(xix)	The action of UV radiation on DNA to induce mutation is					
	a.	Fromation of thymidine dimer	b.	methylation of base pair		
	c.	delation of base pairs	d.	addition of base pairs		
(xx)	Which of the following is not an ionizing radiation					
	a.	X-rays	b.	UV rays		
	c.	cosmic rays	d.	alpha rays		
(xxi)	Genet	ic balance theory was proposed by				
	a.	Morgan	b.	Bateson		
	c.	Harshey	d.	Bridge		
(xxii)	Huma	n DNA is				
	a.	positively supercoiled	b.	negatively supercoiled		
	c.	circular	d.	closed circular		

(xxiii)	ii) C band identify			l•j
	a.	heterochromatin	b.	euchromatin
	c.	Secondary constriction	d.	primary constriction
(xxiv) very lysine rich histone in chromosome is				
	a.	H2	b.	H2B
	c.	Н3	d.	H1
(xxv) Choose the incorrect option wrt genetic code				
	a.	Triplet code	b.	Genetic Code is ambiguous
	c.	Degenerate	d.	AUG is non degenerate

Group - B

		(Short Answer Type Questions)	$4 \times 5 = 20$	
Ansv	ver a	ny four from the following		
2.	a.	Distinguish between dominant and recessive epistatis.	3	3
	b.	Explain recessive epistatis with suitable example	. 2	2
	a.	Briefly elaborate the experimental design made by Mendel to carry out h monohybrid and dihybrid cross in Pea.	is 4	4
	b.	Why Mendel's work was not accepted by contemporary scientist?		1
4.	a.	State the law of independent assortment.	:	2
	b.	Using Punnett square demonstrate the law of independent assortment in dihybrid cross involving two heterozygote parents.	=	3
5.	a.	Discuss the pattern of inheritance of ABO blood group in human.		3
	b.	Why Mendel selected Pea as an experimental material?		2
6.	a.	Discuss blending and non blending theory of inheritance with suitable		3
		example		
	b.	Explain expressivity with suitable example.		2
7.	a.	What are the differences between SAT- DNA and SAT chromosome?		3
	b.	What is VNTR sequences? How it helps in DNA finger printing?		2

Group - C

	(Long Answer Type Questions) 2 x 10	= 20
ver an	y two from the following	
(a)	Discuss the historical development during pre and post Mendelian genetics.	3
(b)	What are the application of model organism in genetics?	7
(a)	Inheritance pattern of flower colour in garden pea and Snapdragon differs. Why is the difference?	4
(b)	Explain showing the cross up to F2 generation.	4
(c)	Explain phenomenon of multiple allelism and co-dominance taking ABO blood group as example.	2
(a)	What are the role of meiosis in the life cycle of organism?	5
(b)	Discuss the check point in cell cycle pregression of yeast.	5
(a)	Discuss different components of eukaryotic chromosome.	6
(b)	What is facultative and constitutive heterochromatin.	4
	(a) (b) (a) (b) (c) (a) (b) (a)	 (a) Discuss the historical development during pre and post Mendelian genetics. (b) What are the application of model organism in genetics? (a) Inheritance pattern of flower colour in garden pea and Snapdragon differs. Why is the difference? (b) Explain showing the cross up to F2 generation. (c) Explain phenomenon of multiple allelism and co-dominance taking ABO blood group as example. (a) What are the role of meiosis in the life cycle of organism? (b) Discuss the check point in cell cycle pregression of yeast. (a) Discuss different components of eukaryotic chromosome.