



# UNIVERSITY OF THE PUNJAB

Roll No. \_\_\_\_\_

**B.A. / B.Sc. Part-II**  
**Annual Exam - 2017**

**Subject: Genetics-II**

**TIME ALLOWED: 1 hrs.**

**PAPER: A (Molecular and Microbial Genetics)**

**MAX. MARKS: 14**

## USE SEPARATE ANSWER SHEET FOR PART-I

**Note: Part-I (Q1 & Q2) is compulsory Time allowed for Part-I is one hour. All questions carry equal marks.**

### Part-I

Q1.	Multiple choice questions	07
1.	<b>Transcription is when...</b> a. a new DNA molecule is made b. a complimentary RNA molecule is made based on information in the DNA template c. protein is made by the coordinated efforts of DNA and RNA d. the replication bubble unwinds in the antiparallel direction	
2.	<b>The 'triplet code' is...</b> a. a series of 3 nucleotide bases that code for an amino acid b. a set of three amino acids on a protein c. a series of genes that code for a specific trait	
3.	<b>Which involves RNA?</b> a. transcription b. replication c. translation d. B & C e. A & C	
4.	<b>Which type of RNA is the "blueprint" of DNA information that is translated in protein synthesis?</b> a. mRNA b. rRNA c. tRNA d. DNA	
5.	<b>Replication is when...</b> a. proteins are made b. RNA is made from the DNA template c. another copy of DNA is made d. DNA is made from the RNA template	

**P.T.O.**

6.	<p>When a piece of bacterial DNA is accidentally moved from one bacterium to another bacterium by a virus, this is called...</p> <ul style="list-style-type: none"> <li>a. transformation</li> <li>b. transduction</li> <li>c. conjugation</li> <li>d. vertical gene transfer</li> <li>e. replication</li> </ul>	
7.	<p>Nucleic acids are made through the polymerization of</p> <ul style="list-style-type: none"> <li>a. nucleic acid.</li> <li>b. nucleotides</li> <li>c. amino acids</li> <li>d. tRNA</li> <li>e. RNA</li> </ul>	
Q2.	<p><b>Fill in the blanks</b></p>	
1.	<p>A virus which infects bacterial cells is known as a _____.</p>	
2.	<p>_____ plasmids give a cell the ability to survive in the presence of certain antibiotics.</p>	07
3.	<p>Bacteriocidal proteins called _____ are produced by some bacterial plasmids.</p>	
4.	<p>Mobile genetic elements called _____ were first found in the 1940s by Barbara McClintock.</p>	
5.	<p>Increasing the number of plasmids in a cell so that more product is produced is a technique known as gene _____.</p>	
6.	<p>_____ enzymes are used to cut DNA at specific sites.</p>	
7.	<p>Joining two pieces of DNA together requires the use of the enzyme _____ to reunite the ends of the two DNA fragments.</p>	



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**TIME ALLOWED: 2 hrs.**  
**MAX. MARKS: 21**

## **USE SEPARATE ANSWER SHEET FOR PART-II**

**Note: Attempt Any Three Questions from Part-II. Time allowed for Part-II is two hours. All questions carry equal marks.**

### **Part-II**

Q3	a. What is Gene cloning? Give one example of any commercial product produce by this process. b. What are restriction endonucleases? Give two examples.	03 04
Q4.	a. What is DNA replication? What are three types of DNA replication? b. What is RNA polymerase? Write its functions.	04 03
Q5	a. What is interrupted matting in bacteria? Explain with example. b. What is transformation? How it discovered?	04 03
Q6	a. What is Translation and Genetic Code? b. Translation system consist of four major components name them and explain briefly? c. Define Operon in Genome of Bacteria?	03 03 01
Q7	Define the following i. Excision repair ii. Light repair iii. Reverse Mutation iv. Mutation v. Mutagen vi. Transduction vii. Gene	01 01 01 01 01 01 01



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Roll No. ....

**Subject: Genetics-II**  
**PAPER: B (Genetics of Eukayotes)**

**TIME ALLOWED: 2 hrs.**  
**MAX. MARKS: 21**

**Attempt Part-II on Separate Answer Sheet Provided.**

**Note: Attempt Any Three Questions from Part-II. All questions carry equal marks.**

## **Part-II**

Q3	(a)	Joe is color blind. His mother and father have normal vision, but his mother's father (Joe's maternal grandfather) is color blind. All Joe's other grandparents have normal color vision. Joe has three sisters—Patty, Betsy, and Lora, all with normal color vision. Joe's oldest sister, Patty, is married to a man with normal color vision; they have two children, a 9-year-old color-blind boy and a 4-year-old girl with normal color vision. Using correct symbols and labels draw a pedigree of Joe's family.	04
		<div><div>■</div> Color blind male</div> <div><div>□</div> Normal male</div> <div><div>●</div> Color blind Female</div> <div><div>○</div> Normal Female</div>	
Q3	(b)	What is the most likely mode of inheritance for color blindness in Joe's family?	03
Q4.	(a)	Explain in brief (2-4 sentences for each) the following terms: I. Inbreeding depression II. Heterosis III. Autopolyploid	03
Q4.	(b)	Give the reasons why maintenance of genetic diversity is important in a plant breeding programs.	04
Q5	(a)	Explain in brief (2-4 sentences for each) the following terms: I. Embryo transplantation II. Genetic Counseling III. Human Genome Project	03
Q5	(b)	Describe importance of Transgenic animals.	04
Q6	(a)	For each of the following modes of inheritance, describe the features that will be exhibited in a pedigree in which the trait is	03

**P.T.O.**

	<p>present:</p> <p>I. autosomal recessive</p> <p>II. autosomal dominant</p>	
Q6 (b)	What are the two types of twins and how do they arise?	04
Q7 (a)	<p>Explain in brief (2-4 sentences for each) the following terms:</p> <p>I. Artificial Insemination</p> <p>II. Acclimatization</p> <p>III. Mutation Breeding</p>	03
Q7 (b)	Describe importance of recombinant DNA techniques.	04



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**TIME ALLOWED: 1 hrs.**  
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**Attempt Part-I on this Question Sheet Only.**

**Note: Part-I (Q1 & Q2) is compulsory.**

## **Part-I**

Q1. A	<p><b>Fill in the blanks.</b></p> <p>1) _____ can help a person or family understand their risk of developing a genetic (inherited) condition.</p> <p>2) A _____ animal is one that carries a foreign gene that has been deliberately inserted into its genome.</p> <p>3) _____ is the breeding of distantly related or unrelated individuals.</p> <p>4) _____ is a traditional plant breeding method in which hybrid organism (offspring of genetically unlike parents) is mated with one of its parents or with an organism genetically similar to the parent.</p> <p>5) _____ is a group of hereditary genetic disorders that impair the body's ability to control blood clotting or coagulation</p>	05
Q1. B	<p><b>Encircle the correct answer. Each question carries equal marks.</b></p> <p>1) _____ is one complete set of genes in an organism ;</p> <p>a) Genome b) Genetic Code c) Karyotype</p> <p>2) _____ is a genetic condition in which a person has 47 chromosomes instead of the usual 46.</p> <p>a) Down Syndrome b) Hemophilia c) HIV</p> <p>3) _____ is the tendency of genes that are located proximal to each other on a chromosome to be inherited together during meiosis.</p> <p>a) Genetic makeup b) Genetic Linkage c) Genetic Code</p>	05

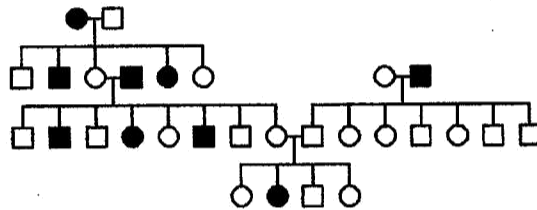
**P.T.O.**

4)

- a) Transcription
- b) Transformation
- c) Translation

5.)

- a) Autosomal dominant
- b) Autosomal recessive
- c) X-linked dominant
- d) X-linked recessive
- e) y-linked dominant
- f) Y-linked recessive



**Qs 2**

**Define the following;**

- 1) Karyotype
- 2) Aneuploidy
- 3) Expressivity
- 4) Penetrance

04