

**B.Sc. (Ag.) Honours Semester-III Examination, 2016**  
**Course No.: GPB-211**  
**(Principles of Genetics)**

Signature of Centre Superintendent

Roll No.: (in figure) _____ (in words) _____
Student Index No. _____ Regn. No. _____ of _____

**Time: Two Hours**

**Full Marks: 40**

*Questions are of value as indicated in the margin*

**Part-I**  
**(Objective and Short Answer Type)**  
**(Use only ball point pen)**

**Time: 20 minutes**

**Full Marks: 10**

*Note: 1. Answer in question paper itself.*

*2. Striking, rewriting or overwriting are not allowed in the objective type questions.*

**1. State True (T) or False (F) in respect the following statements (any six):** **0.5×4=2.0**

- i. Quantitative inheritance is controlled by many genes.
- ii. The noncoding intervening sequences in the primary transcript of eukaryotes are exons.
- iii. Operon concept was proposed by Jacob and Monod.
- iv. Colour blindness in human is not the sex linked trait.

**2. Fill up the blanks with most appropriate words:** **0.5×8=4.0**

- i) The exchange of chromosomal segments between non-sister chromatids of homologous chromosomes is known as \_\_\_\_\_.
- ii) The diploid chromosome number of *Pisum sativum* is \_\_\_\_\_.
- iii) A chromosome with two identical arms and identical genes is called \_\_\_\_\_.
- iv) 47, XXY is associated with \_\_\_\_\_ syndrome.
- v) If 5'GCCATT-3' sequence is present in the template strand of DNA, the base sequence of mRNA synthesized from such strand should be \_\_\_\_\_.
- vi) An extra chromosomal autonomous circular DNA molecule is called \_\_\_\_\_.
- vii) Genomic formula of Monosomy is \_\_\_\_\_.
- viii) Synthesis of \_\_\_\_\_ strand of DNA is discontinuous.

**PTO**

**3. Tick (✓) the correct alternatives :****0.5×10=5.0**

- i) *Triticum aestivum* is  
(a) autohexaploid (b) Allohexaploid (c) Autotriploid (d) Allotetraploid
- ii) The dihybrid Test cross ratio is  
(a) 1:1 (b) 9:3:3:4 (c) 1:1:1: (d) 3:1
- iii) Inheritance of AB Blood group shows  
(a) Complete dominance (b) Overdominance  
(c) Codominance (d) Incomplete dominance
- iv) mRNA formed from DNA is complementary to  
(a) one of the strand of DNA (b) both the strands of DNA  
(c) None of the strands of DNA (d) All of the above
- v) 5-Bu is the structural base analogue of  
(a) Adenine (b) Guanine (c) Cytosine (d) Thyamine
- vi) Down Syndrome is due to  
(a) Trisomy-21 (b) Trisomy-X (c) Monosomy  
(d) Deletion of Chromosome No. 5
- vii) The process of synthesis of RNA from DNA is called  
(a) Replication (b) Transcription (c) Translation (d) Transformation
- viii) Initiation codon for protein synthesis in prokaryotes is  
(a) AAA (b) UAA (c) UUU (d) AUG
- ix) The power house of cell is called  
(a) Mitochondria (b) Ribosome (c) Golgi body (d) Lysosome
- x) The phenomenon of dosage compensation in human being is due to  
(a) Inactivity of one 'X' chromosome in Normal female  
(b) Hyperactivity of one 'X' chromosome in Male  
(c) Hyperactivity of 'Y' chromosome in Male  
(d) None of the above .
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**B.Sc. (Ag.) Honours Examination, 2016**  
**Semester-III**  
**Course No.: GPB-211**  
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**Part - II**  
**( Descriptive Type )**

**Time: 100 Minutes**

**Full Marks: 30**

*Questions are of value or as indicated in the margin*

**Answer any four questions from the following:** **7.5×4=30**

4. Write the laws of inheritance. Explain the law of independent assortment with the help of checkerboard. 2+5.5=7.5
5. Define linkage. State the factors affecting it. What is linkage group? 2+4.5+1=7.5
6. What is gene interaction? Mention the different types of gene interactions studied by you. Discuss complementary gene interaction with a suitable example. 2+2+3.5=7.5
7. Define mutation. Classify mutagens. Highlight the applications of mutation in crop improvement. 2+3+2.5=7.5
8. What is genetic code? Write down the properties of genetic code. 2+5.5=7.5
9. Differentiate between (*any three*) : 2.5×3=7.5
  - i) Test cross and Back cross
  - ii) Autopolyploidy and Allopolyploidy
  - iii) DNA and RNA
  - iv) Nuclear Inheritance and Cytoplasmic inheritance
  - v) Quantitative traits and Qualitative traits
9. Write short notes of the following (*any five*) : 2.5×3=7.5
  - i) Sexlimited traits
  - ii) Okajaki fragments
  - iii) Translocation
  - iv) Multiple Allele
  - v) Cistrom