JAP-1603220001050100-A Seat No. _____

B. Sc. (Bioinformatics) (Sem. V) (CBCS) Examination

November – 2019

BI - 502 : Applied Genomics & Transcriptomics (New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) All questions are **compulsory**.

(2) The **right** side figure indicates total marks of the question.

1 Attempt the following : **14**

(a) Answer the following short questions : **4**

(ALL COMPULSORY)

(1) Xenologues are homologues that are related by _____ within a genome and have different functions.

(2) Algorithm/tools used for polypharmacology ?

(3) What is ITEP ?

(4) _____ is an interaction repository with compiled biological data and linked with software platform for visualizing interaction network.

(b) Answer any **one** of the following questions : **2**

(1) What is Nutrigenomics and Nutrigenetics ?

(2) What are the approaches computational pan-genome ?

(c) Answer any **one** of the following questions : **3**

(1) Explain Subtractive genomics ?

(2) What are the computational challenges of pangenomics ?

(d) Answer any **one** of the following questions. **5**

(1) Explain pangenomics and its applications.

(2) Explain Agrigenomics, Nutrigenomics and Animal genomics.

2 Attempt the following : **14**

(a) Answer the following short questions : **4**
(ALL COMPULSORY)

(1) What is CIDTs ?

(2) Is High throughput targeted amplicon sequencing is used to characterize a particular microbial group in a sample ? (T/F)

(3) _____ assembly paradigm focuses on relationship between substrings of fixed length k (k-mers) derived from the reads.

(4) _____ is the study of the set of metabolites present within an organism, cell or tissue.

(b) Answer any **one** of the following questions : **2**

(1) Define Metabolomics and metabolome ?

(2) What are the problems of metagenomics annotation ?

(c) Answer any **one** of the following questions : **3**

(1) What are the technical challenges of metagenomics sequence analysis ?

(2) What is Conventional Culture-Independent Diagnostic Tests ?

(d) Answer any **one** of the following questions : **5**

(1) Explain various GOS with bacterial diversity.

(2) Explain Metabolic engineering as a tool for cell factories.

3 Attempt the following : **14**

(a) Answer the following short questions : **4**
(ALL COMPULSORY)

(1) Environmental factors when adversely alter gut ecosystem the term called as _____.

(2) TMA/TMAO is related to which diseases ?

(3) Define Psoriasis.

(4) What is GWAS ?

(b) Answer any **one** of the following questions : **2**

(1) What are the roles of human microbiome in colon cancer ?

(2) Explain symbiotic host-flora relationship example along with functions and effects.

(c) Answer any **one** of the following questions : **3**

(1) Explain skin microbiome and its impact on human health ?

(2) Explain oral microbiome in diagnosing and treating diseases.

(d) Answer any **one** of the following questions. **5**

(1) What are the applications of metagenomics in human gut microbiome ?

(2) What are the impacts of gut microbiota on human health ?

4 Attempt the following : **14**

(a) Answer the following short questions : **4**

(ALL COMPULSORY)

(1) List out Small Non-Coding RNA.

(2) _____ are a class of long transcribed but not translated RNAs that are longer than 200 nucleotides.

(3) Adenovirus is a useful model of studying gene expression because _____.

(4) Presence of introns facilitates the formation of several different mRNAs, thus increasing protein yield of different types but from same gene. TRUE/FLASE

(b) Answer any **one** of the following questions : **2**

(1) What are Pseudogenes ?

(2) What are Transcribed-Ultraconserved Regions ?

(c) Answer any **one** of the following questions : **3**

(1) What is the role of non-coding RNAs in disease ?

(2) Comment on exogenous siRNA

(d) Answer any **one** of the following questions : **5**

(1) Biological roles of non-coding RNA

(2) Explain the MicroRNA in detailed

5 Attempt the following : **14**

(a) Answer the following short questions : **4**

(ALL COMPULSORY)

(1) Name any two Transcriptomics technologies.

(2) Which are the two alternatives possible when a reference sequence is available ?

(3) What is the key challenge for DRS ?

(4) Two new developments in RNA-seq technologies are _____ and _____.

(b) Answer any **one** of the following questions : **2**

(1) Give a brief history of transcriptomics

(2) Differentiate : RNA-Seq and Microarray.

(c) Answer any **one** of the following questions : **3**

(1) Explain the different aspects to be considered for RNA-Seq data analysis.

(2) Give a brief history of transcriptomics.

(d) Answer any **one** of the following questions : **5**

(1) Applications of NGS technologies.

(2) Bioinformatics challenges posed by the emergence of RNA-Seq.
