**ST JOSEPH’S UNIVERSITY, BENGALURU -27**

Registration Number:

Date & Session:

**M.Sc. Biotechnology- II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May/June 2024)**

**BTDE 8522: MULTIOMICS TECHNOLOGIES**

**(For current batch students only)**

**Time: 2 hours Max Marks: 50**

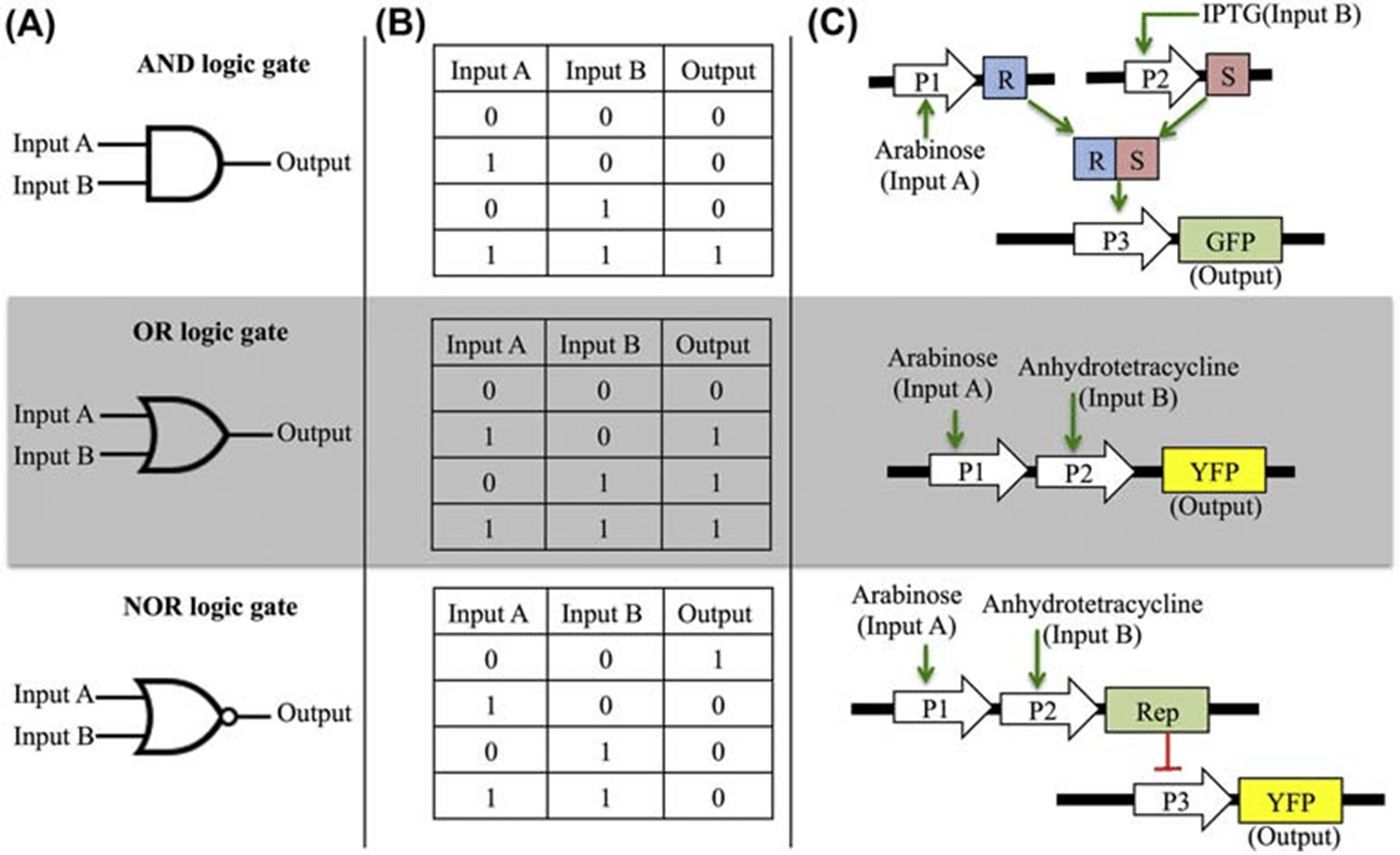
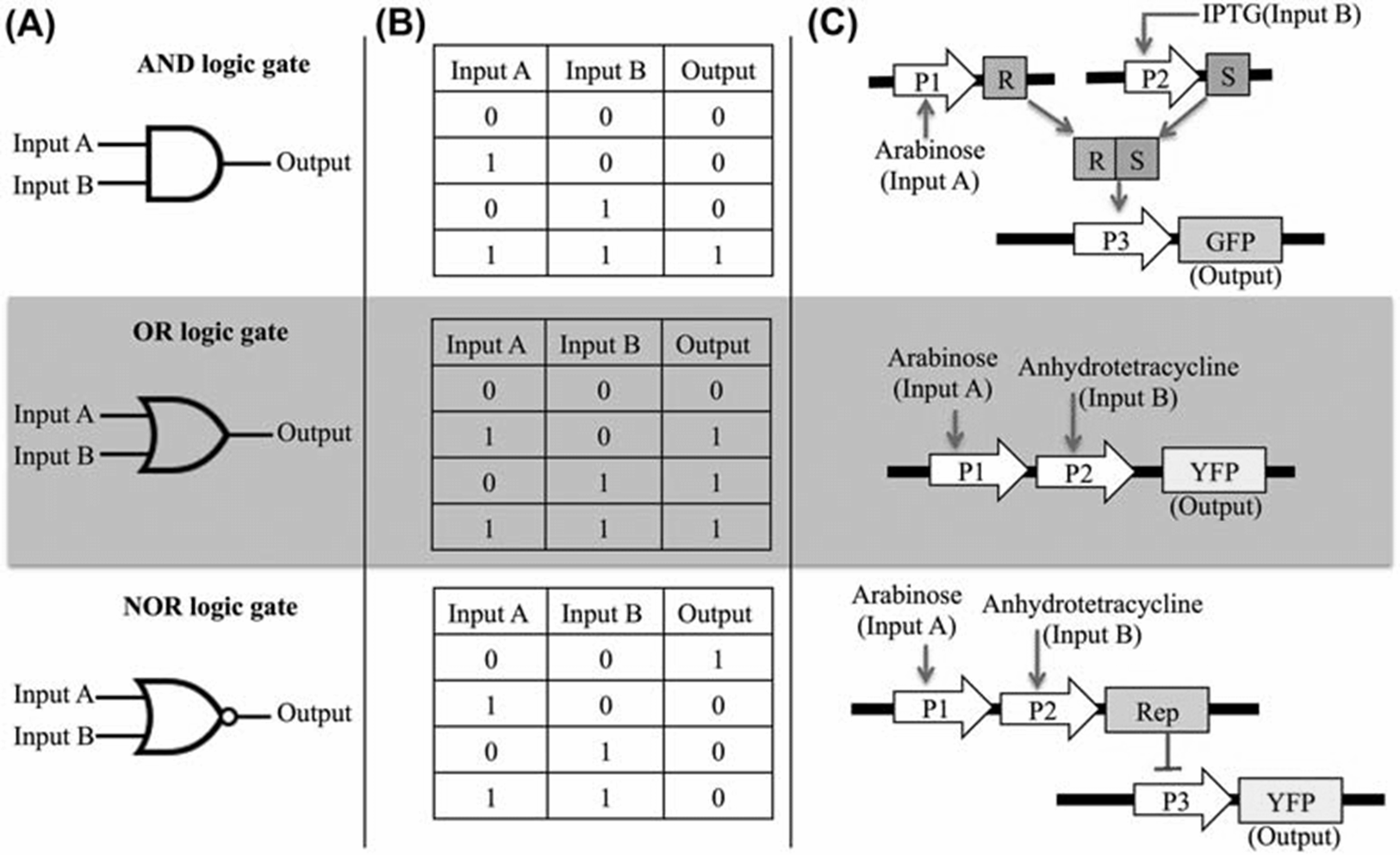
**This paper contains TWO printed pages and THREE parts.**

**INSTRUCTIONS: Draw diagrams wherever necessary using black or blue ballpoint pen.**

**PART A**

**Answer any SEVEN of the following 2m x 7 = 14 marks**

1. What is DIA and DDA in proteomics?
2. What is DIGE?
3. Define Lipidomics. Mention any one application.
4. What is MACS?
5. What is Aracyc?
6. Interpret the type of gate used in the following Gene circuit.



1. What is MNase Sequencing? Why is it important in epigenomics?
2. What is targeted metabolomics?
3. What is the STRING Database? Mention one of its applications.

**PART B**

**Answer any FOUR of the following: 5m x 4 = 20 marks**

1. What is ESI-MS-MS? How do you apply it for proteomics?
2. Distinguish between targeted and untargeted metabolomics.
3. Define the systems biology approach using an example.
4. Explain the principle of Bacterial Photography.
5. Write any four applications of omics in the field of environmental science.
6. What is Gibson assembly?

**PART C**

**Answer any TWO of the following: 8m x 2 = 16 marks**

1. Design an NGS approach with a detailed schematic methodology for identifying the pathway of a rare genetic disease (Apply methodologies based on epigenomics, transcriptomics, proteomics, metabolomics).
2. Design an experimental strategy for producing biofuels in *Jatropha* through synthetic biology.
3. What is single-cell epigenomics? Explain the single-cell bisulfite sequencing strategy using an illustration.