JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION – JUNE - 2023

COURSE CODE (CREDITS): 18MS1BT313 (3) MAX. MARKS: 35

COURSE NAME: RECOMBINANT DNA TECHNOLOGY

COURSE INSTRUCTORS: Dr. Rahul Shrivastava MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

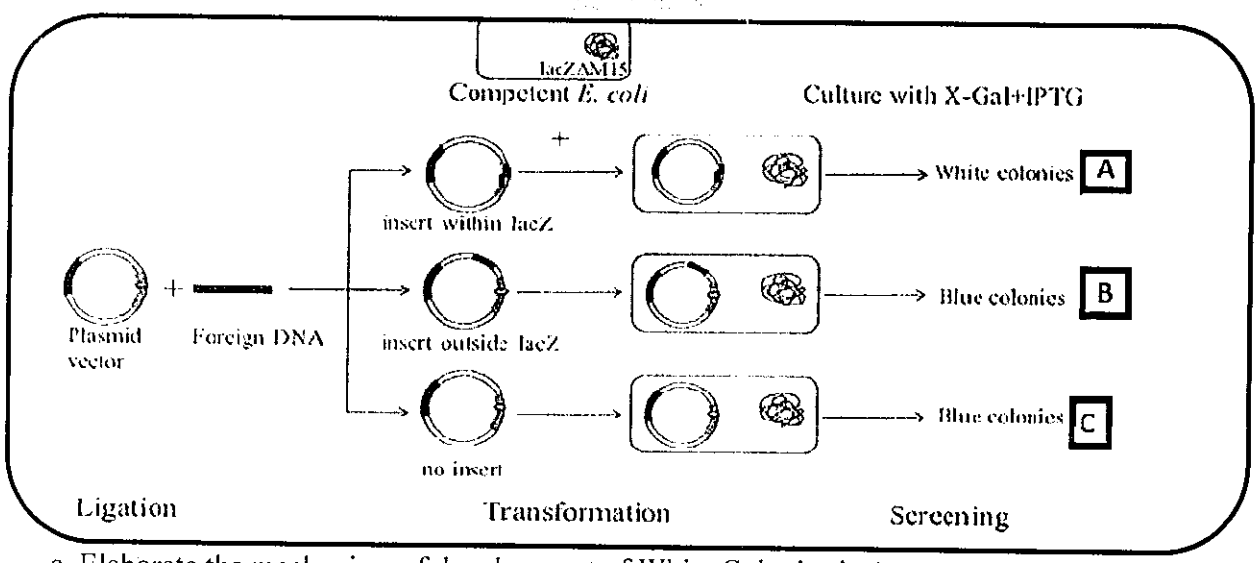
Q1. All genes of a *Homo sapien* cell need to be studied by construction of suitable library. Describe in detail all steps and protocol you will use for construction of the library. Enlist applications of the library constructed. **[5]**

Q2. With reference to transgenic crops write notes on the following: **[2.5 X 2 = 5]**

a. *Agrobacterium tumefaciens* mediated gene transfer

b. *Bt*-cotton

Q3. A schematic representation of a typical blue-white screening experiment is given below, with three different outcomes A, B, and C. Answer the following regarding the experiment:



a. Elaborate the mechanism of development of White Colonies in A **[2 marks]**

b. Give reason for development of Blue colour colonies in B and C. **[2 marks]**

c. How is this blue-white screening helpful for recombinant DNA Technology? **[1 Mark]**

Q4. Write Short notes on the function, mechanism and utility of the following enzymes in recombinant DNA technology: **[2+2+1=5]**

i. Alkaline phosphatase
ii. Terminal deoxynucleotidyl transferase
iii. Polynucleotide kinase

Q5. Write brief notes with examples on applications of genetically engineered microbes in the following domains: **[2 X 3 =6]**

a. Agriculture
b. Environment
c. Medical and Human health

Q6. What is Next-generation sequencing (NGS)? Discuss the principle, workflow, limitations and applications. **[4]**

Q7. Write an essay on 'Biosafety Issues Related to Recombinant DNA Technology'. **[5]**