

**GUJARAT NATIONAL LAW UNIVERSITY
GANDHINAGAR**

Course: **Bio-Technology**
Semester-II (Batch: 2019-24)

End Semester Online Examination: February 2021

Date: 10th February, 2021

Duration: 8 hours

Max. Marks: 40

Instructions:

- The respective marks for each question are indicated in-line.
- Indicate correct question numbers in front of the answer.
- No questions or clarification can be sought during the exam period, answer as it is, giving reason, if any.
- Prescribed Word Limit: 500-600 words

	Marks
Q.1 One of the most interesting cases involving gene therapy was the Jessie Gelsinger case. Jesse died while participating in clinical trial for gene therapy. What happened as a result of his death? Discuss.	(8)
Q.2 Choose a species of agricultural animal and briefly explain the steps for cloning that species. Add a note on the benefits of cloning that species. If the animal could be genetically modified before it is cloned, what beneficial traits should be added?	(8)
Q.3 What was the main influence that prompted the development of Nuremberg Code? What were its main principles? How does the Belmont report align with the principles as stated in the Nuremberg Code?	(8)
Q.4 What do you suppose the world would be like, if there are cures for all infectious diseases and a means to destroy all microorganisms? What characteristics of microbes would prevent this from happening?	(8)
Q.5 Read the following and answer the questions.	(8)

Nancy and James's first child- Joy, suffers from a rare form of cancer. Doctors explain to the couple that chemotherapy may not work in his particular case. Another option is a bone marrow transplant, which involves killing Joy's cells that do not work correctly and replacing them with healthy cells from someone else. If successful, the bone marrow transplant could cure Joy from cancer. However, for this treatment to work, the donor's tissue type should be a very close match to Joy's, which is very rare.

Nancy and James desperately want Joy to have a bone marrow transplant, but neither of their tissue types matches with Joy's. The doctor tells them that they could have a second child, and, if this child's cells match Joy's, the new baby could donate cells from its umbilical cord blood to complete a bone marrow transplant.

Nancy and James decided to have a second child (through IVF, uses PGD to select matching embryo). Their second child Alex is a perfect genetic match for Joy. The parents are overjoyed to learn that the baby's tissue is indeed a good match for Joy's, but doctor's caution that this treatment, while more successful than chemotherapy, still does not guarantee a cure. They caution that Joy may need further tissue donations from Alex later in life that require more invasive procedures, such as removal of bone marrow or organ donations, such as a kidney transplant.

- a) What do you think about the decision of the couple to have a second child to try and help Joy?
- b) What is PGD? How would this have created a perfect match for his brother Joy?
- c) After finding a matching embryo, what might be done with remaining embryos? List five options.
- d) Do you think it is ethical to design and conceive a child that meets specific genetic requirements? Why/ Why not?
- e) What would you think if Joy needs a second bone marrow donation when Alex is 8, and Alex decides he doesn't want to participate?
