MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

III SEMESTER B.TECH. (BIOTECHNOLOGY)

END SEMESTER EXAMINATIONS, JANUARY 2022

SUBJECT: CELL BIOLOGY [BIO 2153]

REVISED CREDIT SYSTEM

Time: 75+10 Minutes MAX. MARKS: 20

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	Dolly the sheep, was the first mammal to be cloned from an adult cell. To create Dolly, a mature cell from the mammary gland of one sheep was fused with the oocyte (egg cell) from another, from which oocyte the nucleus had previously been removed. The result of this fusion was a cell with the vigour and potential of an oocyte but a genetic constitution determined by the nucleus of the mammary-gland cell. This cell eventually grew into Dolly - a sheep whose nuclear DNA was cloned from a single mammary-gland cell. Compare the genetic material of cells of Dolly and the cells of the sheep whose DNA was cloned. Are these genetic materials same or different? Justify your answer.	**4M**
1B.	It has been observed that in cancer cells, some of the genes that are normally expressed are turned off. What are the ways by which these genes can be turned on?	**3M**
1C.	Histones have high content of positively charged amino acids lysine and arginine. Why is it so?	**3M**
2A.	In what ways are the signaling mechanisms in multicellular organisms more advanced compared to single-celled organisms?	**4M**
2B.	Assume you have identified a prospective cancer stem cell. What are the assays that you would carry out to prove that your identified cell is a cancer stem cell?	**3M**
2C.	Is it correct to say that the requirement of oxygen decides the need for angiogenesis? Also state how normal angiogenesis differs from tumour angiogenesis.	**3M**