

**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN,
SEMESTER END EXAMINATION, April 2019**

Subject: AECC Spoken English Sub Code: ENG 107

Semester: II of B.A/B. Sc Total marks: 48 Date: 02/05/2019 Duration: 2Hrs

Instructions: 1) All questions are compulsory (with internal choices).
2) Figures to the right indicate maximum marks.

Q.1. Read the following passage below and make relevant **notes** in approximately **300 words** and give a suitable title for your notes. (16)

Until recently, trying to study key traits of cells from people and other animals often meant analyzing bulk samples of tissue, producing a mashed-up average of results from many cell types. It was like trying to learn about a banana by studying a strawberry-blueberry-orange-banana smoothie. In recent years, however, scientists have developed techniques that let them directly study the DNA codes, the activity of genes and other traits of individual cells. The approach has become widely adopted, revealing details about the body that couldn't be shown before. And it has opened the door to pursuing an audacious goal; listing every cell type in the human body. "Single-cell analysis is crucial for a comprehensive understanding of our biology and health," Dr. Francis Collins, the director of the National Institutes of Health, declared recently.

In fact, the journal *Science* named the techniques that allow single-cell tracking of gene activity over time in developing organisms and organs as its "breakthrough of the year" for 2018. Its announcement declared, "The single-cell revolution is just starting." Even complicated animals like humans are really just massive communities of cells, each taking on a particular role and working with its neighbours. An average adult human has 37 trillion or so of them, and they're surprisingly varied. The inner lining of the colon, for example, has more than 50 kinds of cells.

It was just five years ago that methods for decoding of DNA and its chemical cousin RNA from individual cells became broadly accessible, according to the journal *Nature Methods*. New techniques are still being developed to pry more and more secrets out of individual cells. The single-cell approach is leading to a slew of discoveries. In just the past year, for example - scientists closely tracked gene activity within fish and frog embryos, a step toward the longstanding goal of understanding how a single fertilized egg can produce an animal. One study compiled results from more than 92,000 zebrafish embryonic cells.

Other researchers revealed details of the physical connection between pregnant women and the fetus, giving potential clues for understanding some causes of stillbirth. A study found a pattern of gene activity in some melanoma cells that let them resist immunotherapy, the practice of unleashing the body's immune system on cancer. That might lead to finding a way to render those cells vulnerable. And a pair of other studies may affect research into cystic fibrosis, the genetic disease that causes lung infections and

*****ALL THE BEST*****

- Q.2. Write a job **application letter** in response to an advertisement that you have read in a National daily. Include a complete **Curriculum Vitae** in support of your letter. (16)
- Q.3. Your college is planning to undertake a mega project of building an additional building to accommodate the growing number of students. You are a part of the committee that is responsible to submit a report on the same. Write an **investigative report** involving the details of your research along with recommendations. (16)

SOURCE: Adaptation: <https://www.thehindu.com/sci-tech/science/new-tech/techniques-to-study-individual-cells/article26429416.ece>

she said, but "it is a critical stepping stone."

be found for the entire human body. "This is not going to cure all disease immediately," about a decade, she figures. Regev won't hazard a guess about how many cell types will five years, focused on certain organs and tissues of the body. To finish the job might take more plentiful neighbours, she said. She hopes for a first draft of the cell atlas in about cells are rarer than others, but these can be just as critical for a functioning body as their eventually profile at least 10 billion cells found in both healthy and sick people. Some 57 countries have joined the Human Cell Atlas Consortium, which estimates it will huge effort to catalog every cell type in the human body. More than 1,000 scientists from single-cell results for hundreds of thousands of cells at a time has opened the door to a analyzing the DNA of rare cells in blood tests, he says. Meanwhile, the ability to produce decade or two from now, it might let doctors detect cancers very early by picking up and allow doctors to check how well their treatments are working against cancer over time. A which patients have the highest risk of the disease progressing, he says. It might also

Someday, such research should indicate what treatments to use for particular patients, or identify cells that contain combinations of mutations that make them the most lethal. and where those mutations appeared as the tumor evolved from benign cells. And he can patterns of mutations in various cells of a single tumor. That lets him reconstruct when the University of Texas, Nicholas Navin uses single-cell DNA studies to reveal different further for coming up with new therapies, he said. At the MD Anderson Cancer Center of Cystic Fibrosis Foundation. Single-cell techniques will be important in studying them treatments", said Dr. William Skach, senior vice president of research affairs for the

"The discovery offers great potential for guiding the development of new indications that such cells existed.

that makes large amounts of CFTR, surpassing earlier but only dimly understood version of a protein called CFTR. The studies identified a type of rare cell in the airway limits breathing ability. Scientists have long known that the disease stems from a faulty