JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2023

M.Tech-I Semester (BT/BI)

COURSE CODE (CREDITS):18M11BT113 (3) MAX. MARKS: 25

COURSE NAME: RESEARCH METHODOLOGY AND ETHICS

COURSE INSTRUCTORS: DR. Gopal Singh Bisht MAX. TIME: 1 Hour 30 Minutes

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Note: (a) *All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1.What is the purpose of sampling and why sampling error is important? Explain different types of sampling and when it should be used? [4]

Q2. Describe tools available for keeping up to date with literature and what is RSS? [2]

Q3.Dsicuss various points to keep in mind when choosing a research theme. Explain goals, objective and specific aim of research project. [3]

Q4. How you effectively organize the structure the content of presentation. What techniques can be used to connect with audiences and deliver a successful presentation? [3]

Q5. What are the key components of well formed hypothesis? Why hypothesis is important in scientific research? [3]

Q6. Study the following case and then answer the questions given below. [10]

Dr. John is one of very few molecular biologists working in a particular field. Dr.John receives a paper to review, about a protein called survivin, which he and a graduate student in his laboratory are researching. The article was submitted by Dr. Mark Morris to *Protein Interactions*, a medium-impact journal, and the editor asked Dr. John and two other experts in the field to review the paper. The article suggests a new interaction between survivin and the protein GFX and provides evidence for the fact that both proteins are necessary for the full survival-promoting function of survivin in a cell. The article also describes, though, that if there is too much survivin inside cells they die.

But the paper is fraught with problems: poor controls, inconsistent data in figures, and alternative explanations are not considered and claims are overstated. Dr. John gives the paper to his graduate student Melissa Zane, who gives it a detailed critique and recommends significant revisions. Ms. Zane has never reviewed an article before, and Dr. John thinks that doing so would be a good educational experience for her. Ms. Zane notes the finding about too much survivin being toxic to cells, a problem she has had working with the protein, and discusses it with Dr. John. Both agree that they should lower the dosage of survivin in her experiments; the cells actually survive for a week, longer than her experience before, and then they die.

Dr. John submits Ms. Zane's and his own comments about the research to the editor, suggesting that the paper be accepted only after a few more experiments are performed to validate some of the conclusions. One of the other reviewers has comments similar to Dr. John, and the editor asks Dr. Morris, the author, to make the revisions before he will accept the paper. But in the next few weeks the interaction between GFX and surviving that is discussed in the paper remains in Dr. John's mind. GFX was not a line of inquiry that Dr. John and Ms. Zane were following in their research. They were focusing on other stimulatory proteins, but unsuccessfully. Dr. John suggests to Ms. Zane that she add a compound to the cell culture system that stimulates the cell to produce its own GFX, a method that is somewhat different from what was in the paper by Dr. Morris that is under review. The enhancement method works. The cells live for a month.

Ms. Zane and Dr. John draft a paper based on the results, which includes appropriate controls. *Science*, a prestigious journal, accepts the paper. Several months later, *Protein Interactions* publishes a revised paper from the laboratory of Dr. Morris. But after Dr. Morris sees the article in *Science* he suspects that Dr. John, who was an anonymous peer reviewer on the paper, might have taken some of the ideas for the *Science* article from his paper under review. Dr. Morris knows that Dr. John hadn't been working on GFX because it was hard to purify, and deduces that he used material in the unpublished manuscript to stimulate GFX activity.

a) What recourse is there for Dr. Morris if he suspects that his ideas were plagiarized?[1]
b) Is it appropriate for a peer reviewer to use ideas from an article under review to stop unfruitful research in the reviewer's laboratory? [1]
c) What types of conflict of interest might arise when someone is asked to review a paper or grant application. [2]
d) Is it ever appropriate for a peer reviewer to give a paper to a graduate student for review? If so, how should the reviewer do so? [2]
e) Is it ever appropriate for a reviewer to use ideas from a paper under review, even if the reviewer's method to achieve a result is different from that used in the paper under review? If so, how should the reviewer proceed? [2]
f) What are some of the challenges in the current peer-review process, in which the peer reviewer is anonymous but the author is known to the reviewer? [2]