

Register Number:

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**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**UG – IV SEMESTER**

**SEMESTER EXAMINATION: APRIL 2017**

**PH OE 4216 : Logic & its Application in the Ascent of Physics**

Time- 1 ½ hrs Max Marks-35

**This paper contains two printed pages**

Answer any **SEVEN** questions. Each correct answer carries 5 marks. (5 X 7= 35)

1. Determine whether the following passages contain an argument. If so, identify the conclusion of the argument and determine whether the arguments are deductive or inductive.

a) It is likely that innocent prisoners in this country have been executed for crimes they did not commit. From 1973 until 2007, 124 death row inmates have been exonerated. In many of these cases DNA evidence played a crucial role. Yet, in that same time frame, more than 1000 prisoners were executed. For many of these prisoners no DNA evidence was available. If such evidence had been available, how many more would have been exonerated?

b) If the earth’s magnetic field disappears, then the Van Allen radiation belt will be destroyed. If the Van Allen radiation belt is destroyed, then intense cosmic rays will bombard the earth. Therefore, if the earth’s magnetic field disappears, then intense cosmic rays will bombard the earth.

2.a) i) Since Edison invented the phonograph, there have been many technological developments.

ii)Since Edison invented the phonograph, he deserves credit for a major technological development.

Are they both arguments? Justify your answer.

b) Write **one argument for and one argument against** the following topic indicating premises and conclusions:

Doctors should not be allowed to assist terminally ill patients in committing suicide.

3. Determine the fallacies in the following arguments:

a) The two assumptions involved in developing the Special theory of Relativity of Prof. Einstein are: The laws of Physics are universal and the speed of light is a constant for all the inertial frame of reference observers. Using these two ideas one can obtain the velocity addition theorem, which can be used to prove that speed of light is the same whether you are travelling with the speed of light or at a speed of 100 km/hour.

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Hence we are lead to the inescapable conclusion that speed of light is a constant. We are, however not sure about laws of Physics being universal.

b) Mr. A, a noted yogi and an Astrologer, whose prediction about the choice of CM of UP has come true, has categorically stated that the steady state theory of the universe is not correct. The Big Bang cosmology, that has the support of various religious texts of India should be followed he said. Hence we should all believe in the Big Bang Cosmology.

4. Alan (A), Kiran (K), Ramesh (R) and Wilson (W) are creative artists. Their professions are that of a dancer, painter, singer and writer, not necessarily in the same order.

I) A&R were in the audience the night the singer made his début on the stage.

II) Both K and the writer have had their portraits painted from life by the painter.

III) the writer whose biography of W was a best-seller is planning to write a biography of A.

IV) A has never heard of R

What is each man's artistic field?

5. In a certain mythical community, politicians never tell the truth and non-politicians will always tell the truth. A stranger, who is visiting this village, meets three natives from this community and asks them, “How many of you are politicians?” The fist native replies, “We are all politicians”. The second native says “No, just two of us are politicians”. The third native then says “That is not true either.” Is the third native a politician? Justify your answer.

6. Why is the statement ***Cogito Ergo Sum*** or **I *think therefore I am*** seen in the “Discourse on Method” by Rene Descartes is of great importance in the development of Physical Sciences?

7. What are the different steps involved in solving a problem scientifically? Explain this procedure using any method demonstrated in the class.

8. What is a mathematical function? How will you find whether the function has a minimum? Explain using an example from any field that you are familiar with.

9. Write a Python programme for printing out the multiplication table from 1 to 10.

10. Write a short note on the Normal or Gaussian distribution.