

Register Number:

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

**UG – IV SEMESTER**

**SEMESTER EXAMINATION: APRIL 2019**

**PHOE 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. a) What is a statement? What do you understand by an argument?

b) Determine whether the following passage is an argument or not. If it is an argument, identify the premise(s) and the conclusion(s).

Radioactive fallout isn’t the only concern in the aftermath of nuclear explosions. The nations of planet Earth have acquired nuclear weapons with an explosive power equal to more than million Hiroshima bombs. Studies suggest that explosion of only half these weapons would produce enough soot, smoke and dust to blanket the Earth, block out the sun and bring on a nuclear winter that would threaten the survival of the human race.

(Ref:- John W. Hill and Doris K. Kolb, Chemistry for Changing Times, 7th ed.)

2. What do you understand by a) Deductive Argument b) Inductive argument? Give one example for each type of arguments.

3. Identify the premises and the conclusions of the following arguments. Hence determine whether the argument is inductive or deductive.

a) Each element such as hydrogen and iron absorb certain wavelength when exposed to light that contain all wavelengths. Afterwards, if this light is passed through a dispersing element like a prism or grating we get a spectrum from which certain wavelength are missing. So when we see that certain wavelengths are missing from the spectrum of a star then we know which elements are present on that star.

b) The Encyclopaedia Britannica has an article on symbiosis. The Encyclopaedia Americana, like the Britanica is an excellent reference work. Therefore the Americana probably also has an article on symbiosis.

4. Write down the structure of the following argument and then using a counter-example procedure show that the argument is invalid.

All galaxies are structures that contain black holes in the centre. So all galaxies are quasars since all quasars are structures that contain black holes in the centre.

5. Identify the fallacy in the following arguments.

a) Whoever thrusts a knife into another person should be arrested. Surgeons do precisely this while conducting surgery. Hence, surgeons should be arrested.

b) People have been trying to disprove the claims of astrology. No one has succeeded till now. Hence astrology should be correct.

6. Explain what is meant by scientific method with the help of an example.

7. What contribution did Descartes and Karl Popper do for the progress of science?

8. What do you understand by the statement correlation is not causality. Explain.

9. Write the equation governing the Gaussian distribution. Why is this distribution important in studying natural phenomena?

10. Write a python programme that will print out the multiplication table of three.