

Swami Vivekananda Yoga Anusandhana Samsthana, Bangalore
Semester Examination, May 2012

Course Code: BSC T 604

Max Marks: 100

Course Title : Science and Consciousness

Time: 3 hours

All questions are compulsory

1. Fill in the blanks: (1 × 10 = 10)
- a. General Theory of Relativity includes body in _____ motion.
 - b. According to Special Theory of Relativity, Space-Time continuum is _____.
 - c. Western psychology generally equates consciousness to _____.
 - d. Stars which have stronger gravitational field compared to the earth will produce spectral line of slightly _____ frequency.
 - e. In photoelectric effect, decrease in intensity of incident photon, causes _____ in number of ejected photoelectrons, leaving the energy unchanged.
 - f. According to Newton, _____ is defined as which separates two events.
 - g. Measurement of photon polarization is used in _____ experiment.
 - h. Length of a moving rod (at velocity of light) as perceived by the standing observer will be _____ in _____ direction.
 - i. In a flat space-time length of rod and speed of clock will be _____ everywhere.
 - j. DJ Chalmer classifies the problem of consciousness into _____ and _____.
2. Match the following: (1 × 5 = 5)
- | | |
|---------------------------------|----------------------------|
| a. Special Theory of Relativity | i. Stellar aberration |
| b. General Theory of Relativity | ii. Aspect's Experiment |
| c. Qualia | iii. Same for all observer |
| d. Non-locality | iv. $E=mc^2$ |
| e. Space-Time | v. Subjective experience |
3. True or False: (1 × 10 = 10)
- a. Einstein derives equivalence principle from the Special Theory of Relativity.
 - b. Photoelectric effect shows particle nature of light.
 - c. Strong positive correlation in Aspect's experiment proves Hidden Variable Theory.
 - d. A body in uniform acceleration will have constant velocity.
 - e. Red shift is greater for stars of bigger mass.
 - f. Energy & Position; Momentum & Time are complementary pairs.
 - g. In Aspect's experiment polarization of photons is measured.
 - h. Geodesic is the shortest interval of time between two events, in a curved space-time continuum.

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- i. Change of curvature of space-time is the cause of force experienced by any object.
- j. As strength of gravitational field increases, the rate at which the clock runs will increase.

4. Write briefly about: (2x 5 = 10)

- a. Qualia
- b. Time dilation
- c. Postulates of the Special Theory of Relativity
- d. Non-locality
- e. Heisenberg's uncertainty principle

5. Answer the following: (5 x 5= 25)

- a. Explain photoelectric effect with diagram.
- b. Explain any two experimental proof of the General Theory of Relativity.
- c. How change in space-time curvature can bring force in the field? Explain using an analogy.
- d. How would you relate the outcomes of the General Theory of Relativity to consciousness?
- e. How would you relate the outcomes of the Non Locality to consciousness?

6. Answer the following: (10 x 4 = 40)

- a. Can the existence of Consciousness be proved scientifically? Give your views supporting with reasons and examples.
- b. Explain the Special Theory of Relativity using any two analogies and suitable diagrams.
- c. Explain the following concept using any suitable scientific paradigms:
 - i. I am the creator of this universe
 - ii. The universe and I are inseparable
- d. How does *japa* help us recognizing the 'gap' between two thoughts? What is the nature of that gap?

