DRR-3218
Third Year B. Sc. (Sem. VI) Examination
March / April - 2016
PHY-6011 : Physics : Paper - XI
(Astrophysics & Cosmology) (New Course)

Time : 2 Hours] [Total Marks : 50

Instructions :
(1) Fill up strictly the details of signs on your answer book.
Name of the Examination :
Third Year B. Sc. (Sem. VI)
Name of the Subject :
PHY-6011 : Physics : Paper - XI (New)
Subject Code No. : 3218
Section No. (1, 2,....): NIL

(2) Draw neat diagrams wherever necessary.
(3) Symbols used in the paper have their usual meaning.
(4) Figures to the right side indicate full marks of the question.
(5) Scientific non-programmable calculator may be used.

1 Answer the following questions in brief : 8

(1) What is an astronomical unit?
(2) State the cosmological principle.
(3) State the steady state hypothesis.
(4) What would happen to life on Earth if universe expands for ever?
(5) What is a flow chart?
(6) What are comment lines in a C program?
(7) Pick the incorrect floating point constants from the following :

4.0; \frac{1}{4}; 6300.0; 23,521.

(8) What do you mean by a compound statement in C program?
2
(a) Attempt any one of the following in details:

(i) What is cosmology? Discuss the expansion of universe and hence explain Hubble's law and Hubble parameter.

(ii) Discuss the cosmic microwave background radiation and the present day temperature of the universe.

(b) Attempt any one of the following:

(i) Certain characteristic wavelengths in the light from a galaxy are observed to be decreased in wavelength, as compared with terrestrial sources by about 0.4%. What is the radial speed of this galaxy with respect to Earth? Is it approaching or receding?

(ii) If a star is at a distance of 9 kpc from the center of our Milky way galaxy, and if its tangential velocity is 250 km s\(^{-1}\), then calculate the mass contained within the region of its circular path.

\[
1\text{ pc} = 3.084 \times 10^{11}\text{ km}; \ G = 6.67 \times 10^{-11}\text{ SI}
\]

3
(a) Attempt any one of the following in details:

(i) What is an algorithm? Discuss its essential properties. Write an algorithm to pick up the largest number from a set of three numbers.

(ii) Discuss the different types of numeric constants which are used in C programming alongwith the rules to be followed.

(b) Attempt any one of the following:

(i) Write a program in C to convert temperature in degree Celsius to Kelvin.

(ii) Write a program in C to read the height and base of a triangle and compute its area.

4
Discuss any two of the following in details:

(i) Dark matter.

(ii) Big bang cosmology.

(iii) Operator precedence and the use of parentheses in C programming.

(iv) Input and output functions in C program.