AD-3218
Third Year B. Sc. (Sem. VI) Examination
March/April – 2015
Physics : Paper - XI : PHY - 6011
(New Course)

Time : 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 :
PHYSICS : PAPER - XI : PHY - 6011 (NEW)
Subject Code No. : 3 2 1 8 Section No. (1, 2,.....) Nil
Seat No. :

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

1 Answer the following questions in brief : 8
(1) What do you mean by Doppler's shift?
(2) State the big bang hypothesis?
(3) What is the significance of Hubble's parameter?
(4) What are MACHOs?
(5) What is a preprocessor directive?
(6) What do you mean by a compiler?
(7) Write C expressions corresponding to \((4x + 3)(2y + 2z - 4)\).
(8) Rewrite the input statement \(\text{scanf} \("%d\%d", \&p, \&q\);\) for an octal integer.

2 (a) Attempt any one of the following in details: 10
   (i) Discuss in details the cosmic microwave background radiation and the present day temperature of the universe.
   (ii) Explain the circumstances that leads to the prediction of existence of large quantity of invisible matter in galaxies and hence discuss dark matter.
(b) Attempt any one of the following:

(i) If Sun is at a distance of 8.5 kpc from the center of our Milky way galaxy, and if the mass contained within the region of its circular path is $10^{11}$ solar masses, then calculate its tangential velocity.

\[ \text{Mass of Sun} = 2 \times 10^{30} \text{kg} \]

\[ \text{G} = 6.67 \times 10^{-11} \text{SI} \]

(ii) The wavelength shift in the light from a particular galaxy indicates a recessional speed of $2.8 \times 10^8 \text{m s}^{-1}$

Approximately how far from us is the galaxy. Take Hubble's parameter $H = 19.3 \text{ mm s}^{-1} \text{ly}^{-1}$.

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

(i) Discuss the different types of numeric constants which are used in C along with the rules to be followed.

(ii) What is a flow chart? Discuss in details the standard convention used in drawing a flow chart by giving an illustration.

3. (b) Attempt any one of the following:

(i) If the cost of 10 pencils is Rs. 45, then write a program in C to calculate the cost of 15 dozen pencils.

(ii) Write a program to read the length, breadth and height of a cuboid and compute its volume and total surface area.

4. Discuss any two of the following in details:

(i) The expansion of the universe and Hubble's law.

(ii) Cosmology and general theory of relativity.

(iii) Input and output functions in C program.

(iv) Conditional statements and their use in C programming.