**HAD-003-001601** Seat No. _____

# B. Sc. (Sem. VI) (CBCS) Examination

### June / July - 2017

## Physics : P - 601

*(Nuclear Physics & Space Physics) (New Course)*

**Faculty Code : 003**
**Subject Code : 001601**

Time : $2\frac{1}{2}$ Hours]                                   [Total Marks : **70**

**Instructions :** (1)  All questions are compulsory.

(2)  Symbols have their usual meanings.

(3)  Figures on right side indicate full marks.

(4)  Write answers of all the questions in given answer sheet.

**1**    Answer as required :                                                    **20**

(1)  The modified form of cyclotron is known as _____.

(2)  Write down the names of cyclic accelerator.

(3)  Which partides are also accelerated by proton synchrotron ?

(4)  What do you mean by stopping power ?

(5)  For what detection instruments are used ?

(6)  The straight line portion of the curve in G.M. Counter is called the _____.

(7)  Electron having energy much greater than 1 meV radiate their energy in the form of _____.

(8)  By whom and when radioactivity was discovered ?

(9)  If Q is positive the reaction is _____.

(10) The conversion of one element into another element by artificial means is _____.

(11) What happen if K < 1 ?

(12) The fusion reaction can take place at _____ K temperature.

(13) On which principle Hydrogen bomb works ?

(14) Who explained nuclear fission using Liquid drop model ?

(15) What is the short name of $\pi$-measons ?

(16) Stable elementary particles have their half life time $\geq$ _____ sec.

(17) Steller explosion is known as _____.

(18) A region of space from which nothing including light can escape is _____.

(19) The distance between the two consecutive wave peaks is known as _____.

(20) $\gamma_m \propto \dfrac{1}{T}$ is _____ displacement law.

**2** (a) Answer any three in brief : **6**

    (1) Give the principle of betatrom.

    (2) Explain in short photoelectric effect.

    (3) What is elastic scattering ?

    (4) Give the uses of nuclear reactor.

    (5) Name the fundamental interaction.

    (6) Which system are termed as active system ?

(b) Answer any three : **9**

    (1) Explain only construction of AGS.

    (2) Write note on solid state detector.

    (3) Write down $(\propto, p)$ and $(p, \propto)$ reaction.

    (4) Discuss - self sustaining chain reaction.

    (5) Write note on H-R diagram.

    (6) Write note on PWR.

(c) Answer any two in detail : **10**

    (1) Explain Synchrocyclotron in detail.

    (2) Describe G.M. Counter.

(3) Discuss various types of nuclear reactions.

(4) Explain sources of stellar energy.

(5) Explain an ideal remote sensing system.

3  (a)  Answer any three in brief :                                   6

(1) Give the principle of AGS.

(2) Explain in short - pair production.

(3) What is radiative capture ?

(4) Define multiplication factor.

(5) What do you mean by remote sensing ?

(6) Why moderator is used ?

(b)  Answer any three :                                             9

(1) Write note on proton synchroton.

(2) Write note on Ionization chamber.

(3) Discuss in short conservation of mass-energy and conservation of linear momentum.

(4) Write note on : Hydrogen Bomb.

(5) Write note on : Gluons.

(6) Write note on : White Dwarfs.

(c)  Answer any two in detail :                                     10

(1) Derive the Betatron condition.

(2) Describe scintillation counter.

(3) Derive expression for threshold energy of an endoergic reaction.

(4) Explain the Quark Model for measons and nucleons.

(5) Explain the classification of Galaxies.

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