



DRR-3215

Third Year B. Sc. (Sem. VI) Examination

March/April – 2016

Physics : Paper - VIII

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दृशावेक निशानीवाणी विगतो उत्तरवडी पर अवश्य कपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="THIRD YEAR B. SC. (SEM. 6)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="PHYSICS : PAPER - VIII"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="2"/> <input type="text" value="1"/> <input type="text" value="5"/>	Section No. (1, 2,.....) : <input type="text" value="Nil"/>
Student's Signature	

- (2) All Symbols have their usual meanings.  
(3) Draw neat diagram wherever necessary.  
(4) Figures to the right indicates full marks.

- 1 Answer the following in brief. [08]
- (1) What do you mean by magnetic orbital angular quantum number?
  - (2) What do you mean by Russel-Saunders coupling?
  - (3) For which type of system the state of an atom and the state of electron become identical?
  - (4) What is Zeeman effect?
  - (5) What is Mossbauer effect?
  - (6) How can you say that  $\gamma$ -rays are of nuclear origin?
  - (7) What does time reversal symmetry imply?
  - (8) Is charge conjugation symmetry conserved in weak interaction?
- 2 (a) Describe the vector atom model of an atom and explain the different quantum number associated with it. [10]
- OR
- 2 (a) What is Pauli's exclusion principle? On the basis of this principle explain the configuration of electron in atom. [10]
- 2 (b) For M shell with  $n=3$  calculate the total number of electrons necessary to complete the shell. [4]
- OR
- 2 (b) Calculate the value of Bohr electron magnetron. [4]
- 3 (a) Give the Neutrino theory for explanation of continuous energy spectrum for the  $\beta$ -ray spectrum. [10]

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OR  
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[Contd...

- 3 (a) Describe experiment to determine the charge and mass of  $\alpha$ -particle. How is  $\alpha$ -emission explained? [10]
- 3 (b) Write a note on internal conversion [4]
- OR
- 3 (b) Alpha particles from Polonium travel along a semicircle of radius 20 cm in a magnetic field of flux density 1.763 web/m<sup>2</sup>. Find the velocity and energy of the particles.  $e/m$  for alpha particles =  $4.824 \times 10^7$  Ckg<sup>-1</sup>. Mass of alpha particle =  $6.643 \times 10^{-27}$  kg. [4]
- 4 **Attempt any two:** [14]
- (1) Explain the D<sub>1</sub> and D<sub>2</sub> doublet of sodium spectrum on the basis of electron spin.
- (2) Write a note on Paschen-Back effect.
- (3) Write a note on colored quarks and gluons.
- (4) Write a note on weak interaction.
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