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Roll No. .....

B. Sc. (Com.Sci.) - I Sem.

NP-3574

B. Sc. (Computer Science) Examination,

Dec. 2018

Applied Physics

(BCS-103)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Answer all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 3×5=15

1. The total energy of a particle is exactly twice its rest energy. Find its speed.

2. State Thevenin's theorem.

3. What is an interference of light ?

4. What are the characteristic properties of a laser beam?

5. Show that the time for attaining half the value of the final equilibrium (maximum) current in a circuit having an inductance L and a resistance R in series is $0.69\ L/R$ ($\log_e 2 = 0.69$).

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. What is the velocity of π mesons whose proper mean life is 2.5×10^{-8} sec and observe mean life is 2.5×10^{-7} sec.

7. State and prove superposition theorem.

8. Deduce Einstein's mass energy relation $E = mc^2$.

Section-C

(Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. 15×3=45

9. Write short notes on the following :
   (a) Resolving power of telescope
   (b) Circularly and elliptically polarized light.

10. Describe the phenomenon of interference in thin films. Find the condition of maxima and minima. Show that these condition are complementary in reflected and transmitted light.

11. What are Einstein's coefficients ? Describe the construction and working of Helium-Neon Laser.

12. Describe the construction and working of a Nicol's Prism. Explain how it can be used as an analyser.

13. State the fundamental postulates of the special theory of relativity and deduce from them the Lorentz transformation equation.