



JB-3158

B. Sc. (Sem. IV) Examination

April/May – 2013

Applied Physics : Paper - III

(Mathematical & Modern Physics) (New Course)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दशांशवैल निशानीवाणी विगतो उत्तरवडी पर अवश्य लभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="checkbox"/> B. Sc. (Sem. 4)	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="checkbox"/> Applied Physics : Paper - 3	<input type="text"/>
Subject Code No. : <input type="text"/> 3 <input type="text"/> 1 <input type="text"/> 5 <input type="text"/> 8	<input type="text"/>
Section No. (1, 2,.....) : <input type="text"/> Nil	<input type="text"/>
	Student's Signature

(2) Question 1 is compulsory.

- 1 Answer in short : (each question carries one mark) 8
- Define : Divergence.
 - What is a solenoidal vector field ?
 - What is the theoretical value of electrical resistivity in the superconducting state ?
 - What is Meissner effect ?
 - The value of H_c are always too low for type I superconductors. True or False.
 - Give two properties of plasma.
 - Whether the kinetic energy is conserve in elastic collision or not ?
 - What do you mean by a space plasma ?
- 2 (a) State and prove Green's theorem in plane. 10
- (b) Find a unit normal to the surface, $x^2y + 2xz = 4$ at the point (2, -2, 3) 4

OR

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[Contd...

- 2 (a) State and prove Gauss divergence theorem. **10**
- (b) If $\phi = 2xyz^2$, $\vec{F} = xy\hat{i} - z\hat{j} + x^2\hat{k}$ and c is the curve **4**
 $x = t^2, y = 2t, z = t^3$ from $t = 0$ to $t = 1$, evaluate the line
 integrals $\int_c \phi d\vec{r}$.

- 3 (a) Explain Meissner effect. **7**
- (b) Explain in detail thermal properties of superconductors. **7**

OR

- 3 (a) What is effective cross section of collision. Derive **7**
 necessary equations.
- (b) Write a short note on laboratory equipment for **7**
 maintaining plasma.

- 4 (a) Write short notes : (any three) **12**
- (i) Vector integration
 - (ii) Production of plasma
 - (iii) Plasma oscillations
 - (iv) Type I and Type II superconductors
 - (v) Potential applications of superconductivity.
- (b) Answer in short : (any one) **2**
- (i) What do you mean by conservation of energy in plasma ?
 - (ii) What is penetration depth in superconductors ?
