Registration No: | | | | | | | | | | |

Total Number of Pages: 2 **B.Tech**

BSCP1206

3rd SEMESTER BACK EXAMINATION 2017-18

PHYSICS - II

BRANCH: BIOTECH, METTA, MME

Time: 3 Hours

Max Marks: 70

Q.CODE: B877

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Q.1 **Answer the following questions:** **[2 x 10]**

a) Differentiate between RF and DC accelerators.

b) Write the demerit of Van de Graaff accelerators.

c) What are the advantages of using cyclotron accelerators over linear accelerators?

d) Find the Miller indices of a plane making intercepts of 1, 2 and ∞ with crystallographic axes.

e) What are Bravais lattices? How many Bravais lattices are there?

f) Why X-rays are used for crystallographic study?

g) What is Vortex state of a superconductor?

h) Explain how SQUIDs are used in medical imaging.

i) What are the advantages of using compound semiconductor over elemental semiconductor?

j) What are advantages of graded index optical fiber over step index optical fiber?

Q.2 **a)** Write the construction and working of Cyclotron accelerates with neat diagram. **[5]**

b) Briefly explain the construction and working of linear accelerator with neat diagram. **[5]**

Q.3 **a)** What is reciprocal lattice and reciprocal lattice vector? Discuss the properties of reciprocal lattice. **[5]**

b) State Laue condition in vector form. Derive Bragg's law from Laue condition. **[5]**

Q.4 **a)** What are Miller indices? What are the steps for writing the Miller indices of a plane? **[5]**

b) Define atomic scattering factor. What does it represent? Write an expression for atomic form factor. **[5]**

Q.5 **a)** Derive London equation. Define London penetration depth. How London's penetration depth varies with temp? **[5]**

b) What is the basis of BCS theory? Explain the BCS theory of superconductivity? **[5]**

Q.6 **a)** What is Meissner effect? Explain Meissner effect by using London equation. **[5]**

b) Distinguish between stimulated emission, spontaneous emission and stimulated absorption. **[5]**

Q.7 **a)** Explain construction and working of Ruby LASER. What are the advantages and disadvantages? **[5]**

b) Explain construction and working of He-Ne LASER. Write its advantages of He-Ne LASER over Ruby LASER. **[5]**

Q.8 **a)** What are optical fibers? Briefly explain the principle of operation. Discuss the types of optical fibers? **[5]**

b) Explain the working of Fiber optics communication link with neat block diagram. **[5]**