PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch-SOFTWARE SYSTEMS
(Five year integrated)

APPLIED PHYSICS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks!
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10x1 = 10)

1 What is the need to achieve population inversion?
(i) To excite most of the atoms
(ii) To bring most of the atoms to ground state
(iii) To achieve stable condition
(iv) None of these

2 State the condition for total internal reflection in optical fibre
(i) $n_c > rid$ (ii) $n_c < n_{c1}$
(iii) ric = rid (iv) « $n_c i$

3 Choose the quantity which explains thermal conductivity.
(i) Temperature (ii) Number of electron crossing the area
(iii) Amplitude (iv) Both (i) and (ii)

4 Identify Mathiessen's rule explains
(i) Alloy resistivity (ii)Meal resistivity
(iii) Metal resistivity (iv) Both (i)and (ii)

5 Name the charge carriers in a Semiconductor.
(i) electron (ii) holes
(iii) Neutron (iv) Both (i) and (ii)

6 Which of the following will have a practical diode in forward biased condition?
(i) Zero resistance (ii) Low resistance
(iii) High resistance (iv) Both (i) and (ii)

7 Name the magnetic material excludes magnetic lines of force.
(i) Diamagnetic material (ii) Para magnetic material
(iii) Ferro magnetic material (iv) Both (i) and (ii)

8 What happens when magnetostriction effect happens in a magnetic material?
(i) Increase in length of specimen
(ii) Decrease in length of Specimen
(iii) Increase (or) Decrease in length if specimen
(iv) None of these

9 Find 1 mm is_____ nm.
(i) $10^{-5\,6}$ (ii) $10^{7\,8\,9\,10}$
(iii) 10^6 (iv) lO'^7

10 Who coined the word nano technology?
(i) Eric Drexier (ii) Richard Feyman

SECTION - B (35 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Explain the design of Ruby laser.

OR

b State the principle behind optical fibre communication system. Also classify optical fibres.

12 a Discuss Weidman-Franz law. Also obtain Lorentz number.

OR

b Explain the origin of energy gap using band theory of solids.

13 a Illustrate with examples of extrinsic semi-conductor.

OR

b Produce Clausius - Mosotti equation by analyzing ionic polarization.

14 a Produce a list of difference between soft and hard magnetic materials.

OR

b Analyze about hysteresis in a magnetic materials.

15 a Explain any two method of preparing Nano materials.

OR

b Analyse about Nano ferroelectrics.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Justify He-Ne laser is superior to Ruby laser. Compare its output with energy level diagram.

17 Analyze the free electron theory to deduce electrical conductivity and thermal conductivity and also verify ohms law.

18 Determine Hall voltage by designing of circuit which shows Hall effect.

19 Categorize the different type of energy passed by the magnetic materials based on Domain theory.

20 Point out a preparation method for Nano materials which find application in magnetic and electronic devices.

Z-Z-Z END