THE TEXTAILE ASSOCIATION (INDIA)
G.M.T.A. (REVISED) EXAMINATION-2017
SECTION-A PAPER-(A-1)
ENGINEERING PHYSICS

Date: 23/12/2017
Marks: 100
Time: 10am to 1pm

Instructions:
1. Attempt SIX questions out of which Q.1 is compulsory
2. Answer each next main question on new page
3. Figure to the right indicate full marks
4. Illustrate your answer with sketches and flow chart wherever necessary
5. Use non programmable electronic pocket calculator permissible
6. Mobile and any other communication devices are not allowed in exam hall
7. Assume suitable data wherever necessary

Q.1a. Attempt any Ten of the following:

i. The spherical shape of a rain is due to
   a) Density of the liquid b) gravity c) atmospheric pressure d) surface tension

ii. State and explain Hook’s law.

iii. Define stress and mention SI unit of stress.

iv. The velocity of sound will be greatest in
   a) Water b) air c) vacuum d) metal

v. Define ultrasonic.

vi. What is Pizo-electric effect?

vii. A needle floats on the surface of water because of
    a) Lighter weight b) adhesive force c) O viscosity d) surface tension

viii. Define permeability.

ix. Mention the difference between Dielectric and insulator.

x. Define LASER and mention two characteristic of LASER.

xi. Mention the two uses of UV and IR radiation in textiles.

xii. Define photoelectric effect.

xiii. What is Meissner effect?

Q.2

a. Explain the phenomenon of magnetostriction. How will you produce high frequency sound waves with its help?  

b. What is free surface energy? Find the relation between surface tension and free surface energy.

c. Derive Poiseuille’s formula for the rate of flow of a liquid through a capillary tube.
Q.3  
a. Mention two coherent sources. Describe and explain the formation of Newton’s rings in reflected light.  

b. What is plane polarized light? Describe the construction and working of a Nicol prism.  
c. Define Refractive Index. Derive an expression for magnifying and resolving power.  

Q.4  
a. Write a note on types of electromagnetic radiation and mention its properties.  
b. Write a note on soft and hard magnetic materials.  
c. Explain the classification of magnetic materials.  

Q.5  
a. Write a note on uses of photo sensors in the textile field.  
b. Explain the principle and working of optical fibres.  
c. Explain the basic principle of Holography. Mention its applications.  

Q.6  
a. Describe briefly the seven crystal systems.  
b. What are X-rays? How are they produced?  
c. What is meant by crystal lattice? Define  
   (i) Unit cell (ii) space lattice (iii) Miller indices  

Q.7  
a. Define noise and explain the control of noise in brief.  
b. Give the principle, construction and working of scanning and transmission electron microscope.  

Q.8  
a. Explain the construction and working of He-Ne Laser with energy level diagram.  
b. Discuss the Type I and Type II superconductors.  
c. Explain the terms:  
   (i) Spontaneous emission (ii) stimulated emission (iii) Population inversion.  

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