



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Food Engg.) 2019 Admission**  
**I Semester Final Examination-January 2020**

**Basc.1103**

**Engineering Physics (2+1)**

**Marks:50**

**Time: 2hours**

**I Answer all the questions**

**(10x1=10)**

1. Obtain an expression for numerical aperture of an optical fibre.
2. Write expressions for excess of pressure inside a liquid drop and in a bubble.
3. Define coefficient of viscosity of a liquid.

**State True or False**

4. Interference is possible with longitudinal waves.
5. Magnetic lines of force can pass through a diamagnetic material.

**Fill in the blanks:**

6. Lasing action takes place only when there is \_\_\_\_\_.
7. The angle of contact is \_\_\_\_\_ for water and glass and \_\_\_\_\_ for mercury and glass.
8. Expulsion of magnetic lines of force from the interior of a superconductor material when cooled to its transition temperature is called \_\_\_\_\_.
9. An impure semiconductor is called as \_\_\_\_\_.
10. Splitting of spectral lines in presence of electric field is known as \_\_\_\_\_.

**II Write Short notes on ANY FIVE of the following**

**(5x2=10)**

1. Distinguish between interference and diffraction bands.
2. Define streamlined flow and turbulent flow.
3. Compare ordinary photography with holography.
4. State Raman effect.
5. Explain DC Josephson effect.
6. Distinguish between step index and graded index optic fibres.
7. Explain the purpose of xenon flash tube in a ruby laser.

**III Answer ANY FIVE of the following**

**(5x4=20)**

1. Distinguish between, conductors, semiconductors and insulators.
2. Write any four differences between spontaneous and stimulated emissions.
3. Briefly describe any four important applications of super conductors.
4. Explain any three methods of pumping in the case of lasers.
5. Differentiate between paramagnetic and diamagnetic materials.
6. In Newton's rings setup the diameters of the 5<sup>th</sup> and 10<sup>th</sup> dark rings are 0.4 cm and 0.6 cm respectively. If the radius of curvature of the lens used is 183 cm, calculate the wavelength of light used.
7. Describe the construction of a plane transmission grating. Also write any two salient characteristic features of the grating spectrum.

**IV Write an essay on ANY ONE of the following**

**(1x10=10)**

1. Show that, the diameter of dark ring is proportional to square root of an integer, in the case of Newton's rings. Describe the experimental procedure to determine the radius of curvature of a plano-convex lens by Newton's rings method.
2. Explain the terms spontaneous emission, stimulated emission and population inversion. With neat energy level diagram, describe the three level mechanism of lasing action in a Ruby laser.

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