DEPARTMENT OF PHYSICS
Engineering Optics (PH 301)
End-semester Examination

Full Marks: 35 **Date: Nov. 28, 2019** **Time: 24 Hrs**

Answer all questions.

1. Mention the storage capacities of DVD, blue-ray disc, and dual layer blue-ray disc. Discuss the principle used in writing and reading data with CD. Explain the reason why storage capacities vary in these products. [5]
2. Consider a fully-phase object with amplitude transmittance as $t(x,y) = exp[i\phi(x,y)]$. How this fully-phase object can be observed? Explain with derivation and diagram the principle of phase contrast. [5]
3. Explain with diagram the laser printing process. [5]
4. What is a *liquid crystal*? How such materials are used in display applications? What is the difference between LCD TV and LED TV? [5]
5. What is the difference between imaging with a charge-coupled device (CCD) camera and thermal imager? Explain their workings with diagrams. [5]
6. Explain with diagrams the working principle of a *polarization microscope* and *digital holographic microscope*. [5]
7. How do you define the term *Engineering Optics*? State at least 10 names of devices/instruments where engineering aspect is associated with optics. Discuss what you have learnt new in this course and provide your suggestions with respect to course content, if any. [5]
