Department of Mechanical Engineering
Birla Institute of Technology and Science, Pilani, Pilani campus
ME F472: Precision Engineering
Comprehensive Examination (17/05/2022)
Time: <u>180 min</u>; Max. Marks: <u>35</u>

Note to Students:

1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. This is an OPEN BOOK test. Exchange of notes/books is NOT permitted.
3. However, you are <u>NOT ALLOWED</u> to bring photocopies of handwritten notes.
4. Assumptions made if any, should be stated clearly at the beginning of your answer.

1. A company is set to manufacture IR lenses for night vision thermal imaging cameras. What should be the prerequisites for the company if they wish to achieve surface roughness of not more than 20 nm? **10**

2. Smartphones, laptops, and other electronic gadgets that we use in our daily life includes silicon as the base material. Before processing the silicon, its surface has to be made near perfect flat by removing all peaks from the surface. What technique will you use for such purpose? Explain the process in detail with a schematic? 5+10 = **15**

3. What is surface roughness? Explain its importance in precision engineering. What are the differences between touch based and vision based measurement for surface roughness? Explain with examples. You are provided with a metallic mirror that has been highly polished with a suitable finishing process. Which type of surface roughness measurement will you use and why? 2+2+2+2+2 = **10**

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