Government General Degree College, Chapra
Physics (General)
6th Semester internal examination, 2021-22

Total marks: 15   **Duration: 40 min**

<u>Answer any **three** questions</u>:   3X5=15

1. Explain the concept of virtual ground in an OPAMP. Is there a virtual ground point in the non-inverting mode of operation of an OPAMP?   3+2

2. What is a rectifier? Draw a neat circuit diagram for a half-wave rectifier. Explain the physical mechanism of a Zener breakdowns in a reverse biased p-n junction.   1+1+3

3. State De Morgan's theorem. Explain how the logic function $A\bar{B} + \bar{A}B$ can be realized by using NAND/NOR only.   2+3

4. What is the reverse saturation current of a p-n junction diode? How does it depend on temperature? What is its order for Ge and Si diodes?   2+1+2

5. Explain the principle of operation of a LED. Why is Si not used as a LED material? Which type of semiconductor is suitable for manufacturing LED?   3+1+1

6. Draw the output characteristic curves of an n-p-n transistor in CE mode. Discuss about the different operating regions.   2+3

7. Write down the characteristics of an ideal OPAMP. What is the CMRR of an OPAMP?3+2

8. Explain how an OPAMP may be used as a substractor.   5