

Roll No.

21264

**B. Sc. (Hons.) Chemistry 2nd Semester
Examination – May, 2019**

PHYSICS - I

Paper : CH(H)204 Opt.-i

Time : Three Hours] [Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Questions No. 1 is *compulsory*. Out of the rest you have to attempt *four* more questions selecting at least one from each Unit.

1. (a) Name two commonly used semiconductors. Give the order of conductivities of these materials. 2
- (b) Give one example each of donor type and acceptor type impurity. 2
- (c) What is full form of L.E.D. ? What type of material (give only example) can be used for L.E.D. ? 2

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- (d) What is negative feedback in an amplifier. 2
- (e) Draw symbols of NPN and PNP transistors with proper labelling. 2
- (f) Give any *two* applications of LASERS. 2

UNIT - A

2. Explain P-N junction diode, its depletion region and draw forward and reverse bias characteristics. 7
3. (a) Explain Zener diode. 3
- (b) Explain with a neat diagram how a zener diode can be used as a voltage regulator? 4
4. (a) For a certain transistor $\alpha_{dc} = 0.98$ and emitter current $I_E = 2$ mA. Calculate I_C and I_B . 2
- (b) Draw characteristics of an ideal diode. 2
- (c) Write the formulas for α_{dc} , β_{dc} and γ_{dc} as applied to a bipolar transistor. 3

UNIT - B

5. Discuss voltage divider biasing circuit using a suitable diagram. Explain stability of the circuit. 7
6. (a) How negative feedback in amplifiers leads to stabilization of gain and reduction in noise. 5

(2)

- (b) Calculate the gain of a negative feedback with internal gain $A = 100$ and feedback factor $\beta = 0.1$.

UNIT - C

7. What is coherence? Compare temporal and spatial coherence of a LASER with that of an ordinary source using typical values for both.
8. Discuss He-Ne LASER. (Principle, Construction and Working).

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