

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



U.G. DEGREE EXAMINATION – ALLIED

FOURTH SEMESTER – APRIL 2022

UPH 4401 – APPLIED PHYSICS

Date: 27-06-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Q. No **Answer ALL questions** **(10 x 2 = 20 Marks)**

- 1 Distinguish between intrinsic and extrinsic semiconductors.
- 2 Draw the energy band diagram for a p-type semiconductor.
- 3 Give any two applications of LED.
- 4 Draw the circuit symbol of (a) photodiode, and (b) light-emitting diode.
- 5 State De Morgan's theorem.
- 6 Convert the decimal number $(54)_{10}$ to its binary equivalent.
- 7 Draw the pin diagram of IC 741.
- 8 Write the characteristics of an ideal op amp.
- 9 What is a Laser?
- 10 Write the difference between spontaneous and stimulated emission of radiation.

PART – B

Answer any FOUR questions **(4 x 7.5 = 30 Marks)**

- 11 What is a Zener diode? Explain the V-I characteristic of a Zener diode.
- 12 Explain the principle, operation and characteristics of a photo voltaic cell.
- 13 (i) Show that $\bar{A}B + \bar{B}C + \bar{C}A = A\bar{B} + B\bar{C} + C\bar{A}$ and (4)
(ii) Simplify, $Y = [A\bar{B}(C + BD) + \bar{A}\bar{B}]C$. (3.5)
- 14 Explain with a neat diagram, the working of an op amp as an inverting amplifier.
- 15 Explain the construction, principle and working of Helium Neon laser.
- 16 Explain the extrinsic and intrinsic semiconductors with a neat energy band diagrams.

PART – C

Answer any FOUR questions **(4 x 12.5 = 50 Marks)**

- 17 What is a p-n junction diode? Explain the forward and reverse biasing of a junction diode and also its V-I characteristics.
- 18 Explain the principle and working of a LCD and LED.
- 19 Explain the working of Nd:YAG laser using energy level diagram.
- 20 With a neat circuit diagram, explain the working of an op amp as an integrator and differentiator.
- 21 With a neat diagram and truth table, show that NAND & NOR as universal gates.
- 22 Explain the working of a summing and difference amplifiers with a neat circuit diagram.

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