

PD-261 CV-19  
(522) M.Sc. Physics (Second Semester)  
Examination June 2021  
ELECTRONICS (II)  
Paper - IV

Time : Three Hours]

Maximum Marks : 80

Minimum Passing Marks :

नोट : दोनों खण्डों से निर्देशानुसार उत्तर दीजिये। प्रश्नों के अंक उनके दाहिनी ओर अंकित हैं।

Note : Answer from both the Sections as directed. The figures in the right hand margin indicate marks.

**SECTION-'A'**

1. Answer the following questions:- [1 X 10 = 10]  
(Very short answer type questions)
- (i) Write condition for population inversion in active region.
  - (ii) What is non radiative transitions?
  - (iii) Write any one use of photo conductor.
  - (iv) On what principle solar cell works?
  - (v) Give circuit symbol of Non inverting op-amp.
  - (vi) Write two advantages of negative feedback.
  - (vii) Which type of signal is amplified by op-amp?
  - (viii) What is offset voltage?
  - (ix) In which mode photo transmeter is used commonly?
  - (x) What is Interprater?
2. Answer the following questions :- [2 X 5 = 10]  
(short answer type questions)
- (i) Write name of various types of LED<sup>s</sup>.  
**OR**  
What is LASER? Write its any two applications.
  - (ii) What is photoconductor? Give an equivalent circuit of photoconductor.  
**OR**  
Explain energy band diagram of Solar Cell.
  - (iii) What is differential amplifier? Give circuit symbol of differential amplifier.  
**OR**  
Give block diagram of a typical op-amp.
  - (iv) What is total output offset voltage? Give its expression.  
**OR**  
What do you mean by open loop configuration of op-amp?
  - (v) What is instrumentation amplifier?  
**OR**  
Differentiate between visible LED<sup>s</sup> and infrared LED<sup>s</sup>.

### SECTION-'B'

Answer the following long answer type questions :-

[15 X 4 = 60]

3. What do you mean by optical absorption? Describe construction and working of LDR and write its various applications.

**OR**

Discuss about diode laser with suitable diagram and explain light confinement factor. Give any two uses of Diode LASER.

4. Explain the working principle of photo-transistor. What is bipolar photo transistor?

**OR**

What is solar cells? Explain the working principle of solar cell with suitable diagram and discuss its I – V characteristics.

5. Explain dual input balance output differential amplifier. Give its DC analysis and AC analysis.

**OR**

Differential between inverting and non inverting op-amp and explain the negative feedback opamp.

6. Describe summing, scaling and averaging amplifiers with suitable circuit diagram.

**OR**

What is an Oscillator? Give condition for oscillations and explain wein – bridge oscillator.