



WEST BENGAL STATE UNIVERSITY
B.Sc. Programme 6th Semester Examination, 2022



ELSGDSE03T-ELECTRONICS (DSE2)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.*

GROUP-A

Answer any five questions

2×5 = 10

1. (a) What is impact ionization?
- (b) Why 'LASER' is called so? Explain its nomenclature.
- (c) How one can turn-off an SCR?
- (d) What are the relative advantages and disadvantages of an LCD display as compared to an LED display?
- (e) What is "Population inversion" for a LASER?
- (f) State some applications of PIN 'photodiode'.
- (g) What are the different loss-mechanisms for optical fiber communication?
- (h) "Solar cells have a negative short circuit current (I_{sc})"— Explain.

GROUP-B

Answer any six questions

5×6 = 30

2. Describe the operation of SCR, considering the two-transistor model. 5
3. (a) Explain the operation of photo voltaic cell. 3
- (b) What are the different layers of a solar cell? 2
4. (a) What are the basic condition of 'LASER' emission? 2
- (b) Explain the operation of a LASER. 3
- 5.(a) What is electro-optic effect? 3
- (b) How the shape of 'LED' enhances the efficiency of the device? 2
6. What is the effect of "Numerical Aperture"? Derive the expression of "Numerical Aperture". 2+3

7. (a) Why the use of optical fiber is so popular now? 2
(b) What are the advanced use of LEDs ? 3
8. Explain the construction and working principle of a TRIAC. Draw the I-V characteristics of the device. (1+3)+1
9. A typical LED couples 1.8 mW optical power into an optical fiber, when the drive current is 20 mA. Determine the overall power conversion efficiency when the forward voltage across the diode is 2V. 5
- 10.(a) Why the requirements of power electronics devices are increasing? 2
(b) Why the negative resistance regions are important in some semiconductor devices? 3

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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