2016

M.Sc.

2nd Semester Examination

ELECTRONICS

PAPER—ELC-205

(PRACTICAL)

Full Marks : 50

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Optoelectronics Lab)

Answer any *one* question selecting it by a *lucky draw*.

1. Study the I (Current) – V (Voltage) characteristics of LED (Light emitting diode) of two colours and compare the results.

Allotment of Marks (A.M.)

(a) Theory — 5

(b) Circuit diagram — 2

(c) Implementation of the circuit — 3

(d) Data for I–V characteristics — 9+9

(e) Graph — 5

(f) Comparison of results and discussion — 2.

2. Find the numerical aperture of the given optical fibre. Calculate the acceptance angle of the same fibre.

Allotment of Marks

(a) Working formula — 6

(b) Data for numerical aperture — 20

(c) Calculation of numerical aperture — 3

(d) Calculation of acceptance angle — 3

(e) Discussion of the results obtained — 3.

3. Study the Optical conversion of 4-bit digital signal to its analog form by R–2R ladder Network.

Allotment of Marks

(a) Theory and working formula — 5

(b) Circuit diagram — 2

(c) Implementation of the circuit — 3

(d) Data for different digital inputs — 18

(e) Drawing of graph — 5

(f) Discussion of results obtained — 2.

4. Study the Current (I) – Voltage (V) characteristics of Light emitting diode of three colours and compare the results.

Allotment of Marks

(a) Theory — 5

(b) Circuit diagram — 2

(c) Implementation of the circuit — 3

(d) Data for I–V characteristics — 6+6+6

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(e) Graph — 5

(f) Comparison of results and discussion — 2.

5. Draw the characteristics of the given Voltage LDR for two light intensities. Calculate LDR resistances for both cases and compare accordingly.

Allotment of Marks

(a) Theory and working formula — 5

(b) Circuit diagram — 2

(c) Implementation of the circuit — 3

(d) Data for characteristic curves — 14

(e) Graph — 5

(f) Calculation of LDR resistances — 2

(g) Comparison of resistances in the two cases and discussion about them — 4.

6. Study the frequency response of the given LDR.

Allotment of Marks

(a) Theory — 5

(b) Circuit diagram — 2

(c) Implementation of the circuit — 3

(d) Data for frequency response — 18

(e) Graph — 5

(f) Discussion — 2.

7. Given a slit with a hole of known diameter, determine the wavelength of light from diffraction of a laser beam.

Allotment of Marks

(a) Working formula — 5

(b) Data for diffraction band on both sides of central band
 — 20

(c) Results and discussion — 10.

8. Given a slit with a hole of known diameter, determine the diameter of the hole from the diffraction of a laser beam of known wavelength.

Allotment of Marks

(a) Working formula — 5

(b) Data for diffraction band on both sides of central band
 — 20

(c) Results and discussion — 10.

Marks Distribution

Experiment	:	35
LNB	:	05
Viva-Voce	:	10
Total	:	50