PG/IIS/ELC-205/12(Pr.)

M.Sc. 2nd Semester Examination, 2012

ELECTRONICS

(*Optoelectronics Lab*)

(Practical)

PAPER – ELC-205

Full Marks : 50

Time : 3 hours

Select **one** question by a lucky draw.

1. Study the I-V characteristics of LEDs of two colours and compare the results.

2

Allotment of marks

(*a*) Theory – 5

(*b*) Circuit diagram – 2

(*c*) Implementation of the circuit – 3

(*d*) Data for I - V – 9 + 9

(*e*) Graph – 5

(*f*) Comparison of results and discussion – 2

2. Study of voltage-Lux characteristics of LEDs of two colours and comparison of the results obtained.

Marks allotted for

(*a*) Theory – 5
(*b*) Circuit diagram – 2
(*c*) Implementation of the circuit – 3
(*d*) Data for Voltage and Lux – 9 + 9
(*e*) Graph – 5
(*f*) Comparison of results and discussion – 2

3. Draw the characteristics of the given LDR for two light intensities. Calculate LDR resistances for both cases. compare them.

Allotment of marks

(*a*) Theory and Working formula – 5
(*b*) Circuit diagram – 2
(*c*) Implementation of the circuit – 3
(*d*) Data for characteristic curve – 14
(*e*) Graph – 5
(*f*) Calculation of LDR resistance – 2
(*g*) Comparison of resistances in the two cases and discussion about them – 4

4. Find the numerical aperture of the given optical fibre. Also calculate the acceptance angle for the fibre.

Allotment of marks

(*a*) Working formula – 6

(*b*) Data for N.A. – 20

(*c*) Calculation of N.A. – 2

(*d*) Calculation of acceptance angle – 2

(*e*) Discussion – 5

5. 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*) Recording of data – 18

(*e*) Graph – 5

(*f*) Discussion – 2

6. Measure the diameter of a narrow wire by diffraction of LASER beam. Use any other method to measure the same.

Allotment of marks

(*a*) Working formula – 5

(*b*) Data for diffraction band on both sides of central band– 16

(*c*) Calculation of diameter – 2

(*d*) Diameter measurement by other method – 8

(*e*) Comparison of result and discussion – 4

7. Study the time response of the given LDR.

Allotment of marks

(*a*) Theory – 5

(*b*) Circuit diagram – 2

(*c*) Implementation of the circuit – 3

(*d*) Data for three frequencies – 15

(*e*) Graph – 5

(*f*) Time of response from graph – 3

(*g*) Discussion – 2

8. A narrow wire is supplied. Measure its diameter by any conventional method. Determine the wavelength of the given LASER light with the help of diffraction of it by the given wire.

Allotment of marks

(*a*) Working formula – 5

(*b*) Diameter measurement by any method – 8

(*c*) Data for diffraction band on both sides of the central band – 16

(*d*) Calculation of wavelength – 2

(*e*) Discussion about the difficulties faced and their approximate remedy – 4

Marks distribution

LNB – 05

Viva-voce – 10

Experiment – 35

Total – 50