

CERTIFICATE COURSE (FOR B.Sc. Part-I) Semester I and II

Semester- I INTRODUCTION TO ELECTRICAL GADGETS

Maximum Marks : External 22
Internal 08
Total 30

Time Allowed : (1L+2P)=3 Hours
Total Teaching hours: 40
Pass Marks : 35 %

Out of 30 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 08 marks, and the final examination at the end of the semester carries 22 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus and each question carries 03 marks. Section C consists of 10 marks, having 07 short answer type questions out of which the Candidate is to attempt any five questions of 02 marks each, which will cover the entire syllabus uniformly.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

BASIC ELECTRICITY PRINCIPLES: Voltage, Current, Resistance, and Power, Ohm's law, Series, parallel, and series-parallel combinations, Voltmeter (ac and Dc) and Ammeter, energy meter and its installation. Reading of an energy meter, checking the energy meter paying for electricity. Use of Test Pen/Voltage Tester while installing electric equipment. Fuse implementation.

GROUNDING : Earth Concept, Shock hazard protection using Earth ground, Basic grounding practice.

STUDY OF DOMESTIC CIRCUITS : Installation of Switches, Sockets, Brackets, Buttons and blocks, Conduits, Cables and wires, Domestic Fitting.

SECTION B

TESTING DEVICES : Study of Test Lamp, Line Tester, Phase Tester and Continuity Tester. Testing using digital multimeter.

DIGITAL METER : A/D and D/A converter

SHIELDING: Guidelines, Protection from Electrostatic Discharge, Vand De graff generator (brief), Types of phases.

BASICS OF OSCILLOSCOPE : Analog and digital oscilloscopes, Self Testing, vertical and horizontal sensitivity, Identification of various types of pulses, Voltage, time and frequency measurement.

REFERENCES

1. A text book in ElectricalTechnology-BLTheraja-SChand&Co.
2. A textbook of ElectricalTechnology-AKTheraja.
3. Electronic Instruments and Instrumentation Technology by M.M.S. Anand

Tyol

*Pratima
Debnath*

Rakesh

*Narjeet Kaur
Gaur*

Semester-I

INTRODUCTION TO ELECTRICAL GADGETS
(Practical)

Time Allowed : 2 Hours (Practical)

Max. Marks : 20
Min. Pass Marks: 35%

The candidate is to mark five experiments on the question paper. The examiner will allot one question to be performed.

- (i) One full experiment requiring the student to take some data, analyse it and draw conclusions-(candidates are expected to state their results with limits of error. (08)
- (ii) Brief theory (04)
- (iii) Viva-Voce (04)
- (iv) Record (Practical File) (04)

List of Practicals

1. To study energy-meter.
2. To learn utility of Test Pen/Voltage Tester while installing electric equipment.
3. To study implementation and use of fuse in circuit.
4. To study the Corona discharge in Vande Graff Generator kit.
5. To study conduction of electricity and electrostatic charges.
6. To study attraction and repulsion between the charged body.
7. To demonstrate ring launcher experiment.
8. To analyze the truth tables of various basic digital gates.
9. To study the characteristics of Zener diode and use as voltage stabilizer.
10. To find voltage, current relationship and power factor of a given R-L circuit.
11. Use of multimeter for testing electrical components.

Tyler
Raj Kumar
Department
Arup Thakur
Subject
Subject Pass
Year

Semester-II

OPTICAL FIBERS AND SOLAR POWER

Maximum Marks : External 22
Internal 08
Total 30

Time Allowed : 3 Hours
Total Teaching hours : 40
Pass Marks : 35 %

Out of 30 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 08 marks, and the final examination at the end of the semester carries 22 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from respective sections of the syllabus and each question carries 03 marks. Section C, consists of 10 marks, having 07 short answer type questions out of which the Candidate is to attempt any five questions of 02 marks each, which will cover the entire syllabus uniformly.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Solar energy: Solar energy, its importance, storage of solar energy, applications solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar cell, Need and characteristics of photovoltaic (PV) systems

Type of Solar Cells. Types and characteristics. materials for production, Applications of solar cells. Solar-to-Electrical-based Energy harvesting. Efficiency of solar cell.

SECTION B

Optical Fibers: Optical Fibers and their properties, Principal of light propagation through a fibre, fabrication, components, numerical aperture, Losses in optical fiber.

Application of optical fiber: Fiber optics cables and use in communication.,

REFERENCES

1. Non-conventional energysources-G.D Rai-Khanna Publishers, New Delhi
2. Solarenergy-MP Agarwal-S Chand and Co. Ltd.
3. Solarenergy-Suhas PSukhative Tata McGraw-Hill Publishing Company Ltd.
4. Dr. P. Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
5. J. Balfour, M. Shaw and S. Jarosek, Photovoltaics, Lawrence Goodrich (USA)

T. J. J.

Sudhakar Raj Kumar

Aradhya Thakur

Prakash

Sanjay Kumar

Narjeet Kaur

Aras

Semester-II
OPTICAL FIBERS AND SOLAR POWER
(Practical)

Time Allowed : 2Hours

Max. Marks : 20

Min. Pass Marks: 35%

The candidate is to mark five experiments on the question paper. The examiner will allot one question to be performed.

- | | | |
|-------|--|------|
| (i) | One full experiment requiring the student to take some data, analyse it and draw conclusions-(candidates are expected to state their results with limits of error. | (08) |
| (ii) | Brief theory | (04) |
| (iii) | Viva-Voce | (04) |
| (iv) | Record (Practical File) | (04) |

List of of Practicals

1. To study of solar cell and characteristics.
2. To measure the photocurrent as a function of irradiance at a constant voltage.
3. To determine the Planck's constant using photocell
4. To study the inverse square law using photocell.
5. To study the characteristics of photocell.
6. To study current vs voltage characteristics of CdS Photoresistor at constant irradiance.
7. To measure the numerical aperture of an optical fibre.
8. To study the variation of the bending loss in a multimode fibre

Tyler

Anub Thakur
Raj Kumar

Ranvir Singh
Deepak

Palak

Yash
Nayheet Kaur