

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -1: Mathematical Physics and Classical Mechanics

ASSIGNMENT-1

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. State and Prove the frequency shifting property in Fourier Transforms
2. Write the theorem of Generating Function of Hermite polynomials.

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Define associate covariant and contra variant vectors. Show that the relation between a vector and its associate is reciprocal
2. Find the solution of the Laplace's equation in Cartesian coordinate system

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -1: Mathematical Physics and Classical Mechanics

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. What is meant by initial value problem?
2. Explain the technique involved in numerical integration

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. What is meant by velocity –dependent potential? Where do we come across such a potential?
2. Find a root of the equation $x\sin x + \cos x = 0$ using Newton-Raphson's method

DR.B.R.Ambedkar Open University
M.Sc 1year - PHYSICS (2019-20)
Course -II: Statistical Mechanics and Quantum Mechanics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. Define an Ensemble and mention the three types
2. State and explain Liouille's theorem

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Give a detailed comparison of the three statistics
2. Write a detailed note on the Operators

DR.B.R.Ambedkar Open University
M.Sc 1year - PHYSICS (2019-20)
Course -II: Statistical Mechanics and Quantum Mechanics

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. Write Eigen values and Eigen functions of Hydrogen atom
2. Derive Pauli's spin matrices

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Explain the dirac delta normalization
2. Explain the stark effect in Hydrozen atom

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -III: Solid State Physics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. What do you understand by glass stabilization
2. Explain how the effective mass of an electron varies with wave vector.

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Explain the Laue method of X-ray diffraction. What are the characteristic features of a Laue photograph
2. Discuss the Sommer field quantum theory and explain the behaviour of free electrons in a three dimensional potential box

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -III: Solid State Physics

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. What are the parameters of free electron gas
2. What is Larmor's precession?

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Explain the properties of ferroelectric materials.
2. Explain the Debyes theory of specific heats. What sre its success and failures?

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -IV: Semiconductor Devices: Analog and Digital Electronics

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. How the Op-Amp is used as an integrator?
2. How Zener diode is used as a voltage regulator. Explain

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Explain the operation of RS and JK flip flops along with their truth tables.
2. How does flash A/D converter Operate. Explain.

DR.B.R.Ambedkar Open University

M.Sc 1year - PHYSICS (2019-20)

Course -IV: Semiconductor Devices: Analog and Digital Electronics

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. Explain the working of a 4 to 1 MUX
2. Draw the circuit diagram of half adder and full adder and explain the action along with truth tables.

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Explain the Open loop and closed loop gains of an Op-Amp
2. Draw a neat diagram of RC coupled amplifier and explain its operation

DR.B.R.Ambedkar Open University
M.Sc Ilyear - PHYSICS (2019-20)
Course V: Nuclear Physics & Analytical Techniques

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. Write a note on Radiative Transitions in Nuclei
2. Discuss about the spin states of the two nuclei

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Explain the principle and working of a scintillation detector with a diagram
2. Describe the predictions related to the theory of Shell model

DR.B.R.Ambedkar Open University
M.Sc Ilyear - PHYSICS (2019-20)
Course V: Nuclear Physics & Analytical Techniques

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. Write a note on Mossbauer nuclides
2. What is super hyperfine interaction? Explain

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Derive Bloch equations and explain their significance.
2. With a neat sketch explain the functioning of different parts of SEM

DR.B.R.Ambedkar Open University

M.Sc Ilyear - PHYSICS (2019-20)

Course VI: Electromagnetic Theory and Spectroscopy

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. Explain the action of Polaroid glasses in reducing glare
2. Explain the magnetic effects of an electron

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Write briefly on (a) Magnetic vector potential,(b) Magneto Static boundary conditions,
(c) Magnetic fields in matter
2. Discuss the theory of Paschen-Back effect

DR.B.R.Ambedkar Open University
M.Sc Ilyear - PHYSICS (2019-20)
Course VI: Electromagnetic Theory and Spectroscopy
ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. What parameters can get from the study of vibrational analysis of band systems?
2. What is the principle of IR spectroscopy?

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. Describe intensity distribution of electronic spectral lines using Frank Condon Principle
2. Give the theory of vibration-rotational spectra of diatomic molecules

DR.B.R.Ambedkar Open University

M.Sc Ilyear - PHYSICS (2019-20)

Course VII: Memory Devices and Microprocessors

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines.

1. What is Tri-State Logic? Explain
2. Explain memory organization of 8155 RAM with a block diagram

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines.

1. What is Fan-out logic circuit? Explain its importance on the performance of a digital system
2. Discuss fetch operation and execute operation

DR.B.R.Ambedkar Open University

M.Sc Ilyear - PHYSICS (2019-20)

Course VII: Memory Devices and Microprocessors

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. What is hand shaking?
2. Write Assembly language programme for addition of two 16 bit number

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. Draw the pin diagram of 8086 microprocessor and explain the function of all the signals generated on the pins
2. Compare and contrast between memory mapped I/O and isolated I/O

DR.B.R.Ambedkar Open University

M.Sc Ilyear - PHYSICS (2019-20)

Course VIII: Microwave Devices and Communication Systems

ASSIGNMENT-I

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. What are the advantages of wave guide?
2. What are the characteristics of circular wave guide

Section-B

(Marks: 10)

II. Answer any **one** of the following questions in about 30 lines

1. What are the characteristics of E-Plane Tree, H-Plane tree and Magic tree
2. Explain the working of Magnetron Oscillator

DR.B.R.Ambedkar Open University

M.Sc Ilyear - PHYSICS (2015-16)

Course VIII: Microwave Devices and Communication Systems

ASSIGNMENT-II

Maximum Marks: 15

Minimum marks: 06

Section-A

(Marks: 05)

I. Answer any **one** of the following questions in about 10 lines

1. Briefly describe the ratio detector
2. Draw the block diagram of CW radar and explain its working