Dr. B.R. Ambedkar Open University

M.Sc IIyear - PHYSICS (2018-19)

Course V: Nuclear Physics & Analytical Techniques

FIRST ASSIGNMENT

Maximum Marks: 15

Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. Explain what is meant by a nuclear reaction? Discuss various types of nuclear reactions, which may occur when a high energetic particle approaches a nucleus. Give an example for each type of nuclear reaction.
2. Derive Bohr's formula for ionization due to passage of heavy charged particles in the medium.

Section-B (Short answer type)--------1×5

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

1. What are Fermi-kurie plots? Discuss their importance

2. Discuss about the nature of the Nuclear forces

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Course V: Nuclear Physics & Analytical Techniques

SECOND ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

Section-B (Short answer type)--------1×5

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

1. Discuss the principle of electron microscopy and give their applications.

2. Describe the theory of deuteron

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Course VI: Electromagnetic Theory and Spectroscopy

FIRST ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. State and explain Faraday's and Lenz's laws. Obtain expressions for self and mutual inductance.
2. Explain L-S coupling. Derive the spectral terms for Calcium(z=20) arising the configurations (i)two equivalent s electrons (ii) one s and one p electrons

Section-B (Short answer type)--------1×5

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

1. Write the Maxwell equations for charge and current free regions of matter.

2. Discuss Stark effect

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Course VI: Electromagnetic Theory and Spectroscopy

SECOND ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. Explain pure rotational Raman Spectra and discuss stokes and anti-stokes lines.
2. Describe intensity distribution of electronic spectral lines using Frank Condon principle.

Section-B (Short answer type)--------1×5

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

1. Outline the effect of isotopic substance on the rotational spectra of molecules
2. What is hyperfine splitting of Spectra?

M.Sc IIyear - PHYSICS (2018-19)

Course VII: Memory Devices and Microprocessors

FIRST ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. What are the various status flags in 8085 microprocessor? Explain the functions of the flags
2. Write an Assembly language programme to find the sum of two decimal numbers

Section-B (Short answer type)--------1×5

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

1. Compare the logic levels of TTL, ECL, and CMOS logic families
2. Explain memory organization of 8155 RAM with a block diagram

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M.Sc IIyear - PHYSICS (2018-19)

Course VII: Memory Devices and Microprocessors

SECOND ASSIGNMENT

Maximum Marks: 15

Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. Give the salient features of PIC 8259 and explain the function of all the signals using the pin diagram.
2. Compare and contrast between memory mapped I/O and isolated I/O

Section-B (Short answer type)--------1×5

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

1. What is hand shaking?
2. Explain the following instructions with examples:

   a) Loop b) MOVSB c) REP label prefix d) XCHG

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M.Sc IIyear - PHYSICS (2018-19)

Course VIII: Microwave Devices and Communication Systems

FIRST ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. Discuss the propagation of TM waves in a rectangular wave guide.
2. Explain the operation of Tunnel diode and its volt-ampere characteristics.

Section-B (Short answer type)--------1×5

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

1. Discuss about reflection in a parallel plane wave guide
2. Write S-matrix for a 2-port junction

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M.Sc IIyear - PHYSICS (2018-19)

Course VIII: Microwave Devices and Communication Systems

SECOND ASSIGNMENT

Maximum Marks: 15
Minimum marks: 06

Section-A (Essay Type)--------1×10

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

1. Explain the working of a basic Radar Equation
2. Describe the construction of helical antenna. Discuss the radiation pattern of helical antenna

Section-B (Short answer type)--------1×5

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

1. Explain the principle of Square law detector

2. Explain the terms (i) Gain, 2) Efficiency,3)Radiation resistance of an antenna.