### FOUR YEAR B.Sc. DEGREE EXAMINATION, JANUARY - 2024

### CHOICE BASED CREDIT SYSTEM

### FIRST SEMESTER

### PART - I

# PAPER - I : ESSENTIALS AND APPLICATION OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

(Common to Mathematics, Statistics, Chemistry, Computer Science, Data Science, Electronics and Physics)

(Under CBCS New Regulation w.e.f the academic year 2023-24)

Time: 3 Hours

Max. Marks: 75

#### **SECTION-A**

Answer any Five of the following questions. Each question carries equal marks.

 $(5 \times 5 = 25)$ 

- 1. Define Mechanics and discuss Newtonian Mechanics.
- 2. Draw a neat Diagram of Electromagnetic waves with labelled
- 3. Write a note on classification of matter with examples.
- A. Give a list of Monosaccharides.
- Write the importance of chemistry in Materials Science.
- **6.** What is the role of physics in Aerospace industries?
- 7. Discuss the various types of Networks.
- 8 Write a note on Cryptography.
- 9. Find the modular and amplitude form of 3+2i
- 19. Find the vector product of vectors 2i+3j+4k and 3i+4j+2k.

#### SECTION-B

(1)

Answer All the questions. Each Question carries equal marks.

 $(5 \times 10 = 50)$ 

- 1 a) Discuss the laws of thermodynamics and significance (OR)
  - b) Write a note on the following
    - i) Wave particle duality
    - ii) Nuclear particles

P.T.O

12. a) Discuss the Modern periodic table based on electronic configuration.

(OR)



Write a note on the following

- i) Fats
- ii) Vitamins
- 13. a) Write the applications of physics in the Electronics and semiconductor industry.

(OR)

b) Write the applications of chemistry in the Food and Beverage industry.

14. a) Define Internet and discuss role of internet in computer evolution

(OR)



Write a note on

- i) Malware
- ii) Fraud Techniques.
- 15. a) In triangle ABC,  $\underline{B} = 90^{\circ}$  and BA = 3, BC=4 and AC= 5 then find
  - i) All trigonometric ratios of angle B and
  - ii) Verify  $\sin^2 B + \cos^2 B = 1$

(OR)



Find the mean, median and mode of the following data.

Class interval	40-50	50-60	60-70	70-80	80-90
Frequency	5	12	23	8	2

[Total No. of Pages: 2

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## FOUR YEAR B.Sc. DEGREE EXAMINATION, JANUARY - 2024

## CHOICE BASED CREDIT SYSTEM

### FIRST SEMESTER

### PART - II

# PAPER- II: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

(Common to Mathematics, Statistics, Chemistry, Computer Science, Data Science, Electronics and Physics)

(Under CBCS New Regulation w.e.f the academic year 2023-24)

Time: 3 Hours

Max. Marks: 75

### **SECTION-A**

Answer any Five of the following questions. Each question carries equal marks.  $(5\times5=25)$ 

- Write a note on Nanosensors.
- Z Discuss impact of chemical pollutants on ecosystem.
- Write a note on solid waste management.
- Write the recent advances in biophysics.
- 5. Discuss energy efficient materials and devices.
- 6. Discuss application of medical physics.
- Give detailed use of the Binary Number system on Advance level.
- 8. Define Signals and explain working of Digital Modem.
- **9.** Find the point of intersection of the lines x+y=1 and x-y=3.
- 10. Find the derivative of the function  $x^2e^x$

### **SECTION-B**

Answer All the questions. Each question carries equal marks.

 $(5 \times 10 = 50)$ 

11. a) Write a note on Recent advances in the field of nanotechnology.

(OR)

45)

Discuss about Quantum dots.

3-1-101B-R23

(1)

[P.T.O

12. Write a note on Dye removal through the catalysis method.

(OR)

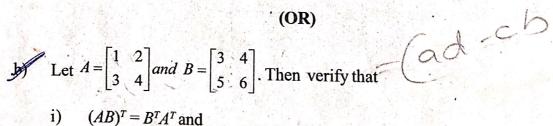
- Discuss the impact of chemical pollutants on Human health.
- Discuss Mathematical modeling applications in physics.

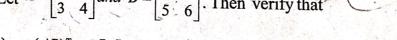
(OR)

- Discuss Mathematical modeling applications in chemistry. b)
- 14. a) Write a note on the following Networking devices
  - i) Repeater
  - ii) Router.

(OR)

- Write a note on the following Networking devices
  - 1) Bridge
  - 2) Hub
- Evaluate the following integrals 15. a)
  - $\int \sin^2 x \ dx \ and$
  - $\int (x^2 + 2x 3)^2 (x + 1) dx$





- $(AB)^T = B^T A^T$  and
- ii)  $\det(AB) = (\det A) (\det B)$

3-1-101B-R23

(2)