

**BSCS-SO101**

**B.Sc. DEGREE EXAMINATION, DECEMBER - 2024**  
**(Semester - I) (CBCS Pattern) (New Regulation)**  
**COMPUTER SCIENCE**

**Essentials and Applications of Mathematical, Physical  
and Chemical Science**

**(w.e.f. 2023-2024 Admitted Batch)**

**Time : 3 Hours**

**Max. Marks : 75**

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**SECTION - A**

**I. Multiple choice questions: (30 × 1 = 30)**

1. If  $\sin 2A = 2\sin A$ , then A is

a)  $30^\circ$

b)  $0^\circ$

c)  $60^\circ$

d)  $90^\circ$

2. If  $Z = 4 + i$  what is the real part of Z.

a) 4

b)  $i$

c) 1

d)  $4 + i$

3.  $(x + 3) + i(y - 2) = 5 + 2i$  than find the values of x and y.

a)  $x = 8$  and  $y = 4$

b)  $x = 2$  and  $y = 4$

c)  $x = 2$  and  $y = 0$

d)  $x = 8$  and  $y = 0$

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4. Find the mode of data

8,5,2,5,3,5,3,1

- a) 3
- b) 5
- c) 2
- d) 1

5.  $0 + 0i$  is \_\_\_\_\_ for complex number  $Z$ .

- a) additive inverse
- b) additive identity
- c) multiplication identity
- d) multiplications inverse

6. The weight of four bags of wheat (in kg) are 103,105,102,104. Find the mean weight

- a) 103.5 kg
- b) 100 kg
- c) 103 kg
- d) 104 kg

7. The word physics comes from a \_\_\_\_\_ word.

- a) India
- b) Greek
- c) Latin
- d) England

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8. To every action there is always an equal and opposite reaction which law \_\_\_\_\_
- a) Newton's first law
  - b) Newton's second law
  - c) Newton's third law
  - d) none
9. Which rays used in medicine to destroy cancer cells.
- a) Gamma - rays      b) X-rays
  - c) Visible rays      d) UV-rays
10. Electron relative charge
- a) +1      b) -1
  - c) 0      d) 2
11. Sound waves move more through sea water \_\_\_\_\_.
- a) 1450 m/s      b) 1200 m/s
  - c) 1400 m/s      d) 1500 m/s

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12. How many types of electromagnetic waves \_\_\_\_\_.

a) 5                                  b) 6

c) 7                                  d) 9
13. Which of the following drug is used for AIDS patients.

a) AGT                              b) BCT

c) BCP                              d) AZT
14. Who is the father of Modern Periodic table?

a) Mosley                          b) Mendeleev

c) Neel's-Bhor                  d) Douber neer
15. How many elements are present in 4<sup>th</sup> period?

a) 2                                  b) 8

c) 18                                d) 10
16. Another name of main group elements

a) Transition elements

b) Representative elements

c) Inner transition elements

d) Noble gases

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17. Transition elements are

- a) Good conductors of heat
- b) Used as catalyst
- c) Good magnetic nature
- d) All of the above

18. Electronic configuration of “Cr”

- a)  $[\text{Ar}] 4s^2 3d^4$
- b)  $[\text{Ar}] 4s^1 3d^5$
- c)  $[\text{Ar}] 4s^1 3d^5$
- d)  $[\text{Ne}] 4s^2 3d^4$

19. Calculus is applied in optics to understand the behaviour of

- a) light
- b) refraction
- c) diffraction
- d) all the above

20. Numerical techniques used in physics

- a) Euler's method
- b) Cayley's theorem
- c) Parseval's technique
- d) Mendeleev's technique

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21. \_\_\_\_\_ are physics principles in understanding the behaviour of 'air' around aircraft surfaces.
- a) Propulsion systems
  - b) Structural Analysis
  - c) Aerodynamics
  - d) All of the above
22. Satellite Communication systems include the design of
- a) Antennas
  - b) Signal propagation
  - c) Link budgets
  - d) None
23. API's stands for
- a) Active Pharmaceutical Ingredients
  - b) Analytic Pharmaceutical Ingredients
  - c) Active Polymer Ingredients
  - d) Analytic polymer Ingredients

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**24. The following are food preservatives**

- a) Sodium benzoate
- b)  $\text{C}_6\text{H}_5\text{COONa}$
- c) Salts of sorbic
- d) All

**25. Based on the size of the computer, how many types of computers are present**

- a) 7
- b) 5
- c) 3
- d) 4

**26. A network that links many different types of computers all over the world.**

- a) Intranet
- b) Internet
- c) Arpanet
- d) LAN

**27. The size of an IP address in IPV6 is**

- a) 32 bits
- b) 64 bits
- c) 128 bits
- d) 265 bits

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**28. In cryptography, what is cipher.**

- a) Algorithm for performing encryption and decryption**
- b) Encrypted message**
- c) Both algorithm for performing encryption and decryption and encrypted message**
- d) None**

**29. Which of the following is a programs the copy themselves throughout a computer or network.**

- a) Worms**
- b) Trojans**
- c) Viruses**
- d) Root kits**

**30. Which computer works on data in 0's and 1's**

- a) Digital computer**
- b) Hybrid computer**
- c) Physical computer**
- d) Analog computer**

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### II. Fill in the blanks

(10 × 1 = 10)

1. If  $z_1 = -1$  and  $z_2 = i$  then find the value of  $\arg \left( \frac{z_1}{z_2} \right) = \underline{\hspace{2cm}}$ .
2. If  $3\sin \theta + 4 \cos \theta = 5$  then find the value of  $4 \sin \theta - 3 \cos \theta = \underline{\hspace{2cm}}$ .
3. Sound is classified into           .
4. In law of thermodynamics  $\Delta U = \Delta Q - \Delta W$  where  $\Delta Q = \underline{\hspace{2cm}}$ .
5. Each d-series is having        elements.
6. Chemical change is generally        process.
7. Patiens are composed with           .
8. Carbohydrates are           .
9.            Computers can be easily used for individual use.
10. The goal of stealing sensitive data like credit card and login information is called       .

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### **SECTION - B**

#### **III. Very short answer questions**

**(15 × 1 = 15)**

1. Evaluate  $\sin^2 60^\circ + \cos^2 45^\circ$ ?
2. Find the mean of first 5-natural numbers.
3. Express  $-1 + i$  in polar form.
4. What is photoelectric effect?
5. Define Newton's second law?
6. What is first law of Thermodynamics?
7. How many groups are there in the modern periodic table?
8. Name a substance which exists naturally in all the -three states?
9. Define vitamins?
10. Write any two uses of physics in robotics?
11. What do you mean by food chemistry?
12. What are food preservatives?
13. What is a Domain name?
14. What is VPN?
15. What is a Digital Singature?

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IV. Match the following

(10 × 1 = 10)

- |   |                                    |
|---|------------------------------------|
| 1. Tan 2A                               | a) 100 - 400 NM                    |
| 2. $x + iy$ form of $\frac{2}{3+4i}$ is | b) Plain text to cipher text       |
| 3. Electron                             | c) $\frac{6}{25} + i\frac{8}{25}$  |
| 4. U-V rays                             | d) Richard Henderson               |
| 5. Vitamin B <sub>1</sub>               | e) $\frac{2 \tan A}{1 - \tan^2 A}$ |
| 6. 16-Group elements                    | f) Wireless Fedelity               |
| 7. Biomolecules                         | g) J. J. Thomson                   |
| 8. Carbohydrates                        | h) Chalkogens                      |
| 9. WIFI                                 | i) Thiamine                        |
| 10. Encryption                          | j) Monosachrides                   |
|   | k) Ascorbic Acid                   |

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### **SECTION - C**

#### **V. True or False**

**(10 × 1 = 10)**

1. The value of  $\sqrt{i} + \sqrt{-i}$  is  $\sqrt{2}$  (T/F)
2.  $\cot A \cot B + \cot B \cot C + \cot C \cot A = 1$  (T/F)
3. Neutron discovered by James Chadwick in 1932 (T/F)
4. Magnetic lines of forces never intersect each other (T/F)
5. 1<sup>st</sup> period is having two element (T/F)
6. -Carbohydrates are made up of nitrogen (T/F)
7. Quantum field theory is to study the behaviour of Quantum fields (T/F)
8. WLAN is also called as Ethernet (T/F)
9. Vaccum tubes are used in third generation of computers (T/F)
10. Aerodynamics describes the behaviour of air around Air India surfaces (T/F)

