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2803E1387

Candidate's Seat No :_____

B.Sc. Semester-5 Examination

SE 305

Physics (A)

March-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q: 1

(a). Describe the effect of reducing the size from bulk to nano with examples. **(07)**

OR

(a). Discuss in brief about Excitons. **(07)**

(b). What are nano materials? Give the classification of nano materials and describe how the quantum confinement results a blue shift on band gap in nano materials. **(07)**

OR

(b). Write a note on semiconductor nano-particles. **(07)**

Q: 2

(a). Write a note on the synthesis of nano particles by Physical Vapour Deposition method. **(07)**

OR

(a). Describe High Energy Ball Milling method to synthesis nano materials. **(07)**

(b). Discuss Colloids and Colloids in solutions. Also discuss synthesis of Colloids. **(07)**

OR

(b). What are Sol and Gels? Describe Sol-gel method for the synthesis of nano materials. **(07)**

Q: 3

(a). Describe the construction and working of Scanning Electron Microscope (SEM). **(07)**

OR

(a). Describe in detail about X-ray diffraction experiment. **(07)**

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(b). Discuss the applications of nanotechnology in space and defense. **(07)**

OR

(b). Discuss applications of nanotechnology in Electronics. **(07)**

Q: 4

(a). Can nano particles be considered as metals? Explain Coulomb blockade and Staircase for a quantum dot. **(07)**

OR

(a). Write a note on the synthesis of nano particles by Chemical Vapour Deposition (CVD). **(07)**

(b). Describe about the structure of Carbon Nano tubes. **(07)**

OR

(b). Discuss the applications of nanotechnology in cosmetics. **(07)**

Q: 5 Attempt any seven (7) from the following(each question carry 2 marks): (14)

1. What do you mean by plastic deformation?
2. Define Cathode Luminescence.
3. What do you mean by a technique called EDAX?
4. What are diamagnetic materials?
5. Full form of MOCVD is .....

(A) Mineral Chemical Vapor Depositi (B) Metallo Organic Chemical Vapor Deposition

(C) Melted Chemical Vapor Deposition (D) Mineral Organic Chemical Vapor Deposition

6. Fullerenes with ..... atom molecule is the most stable.

(A) 60 (B) 70 (C) 78 (D) 55

7. State types of mills used in High energy ball milling method.
8. Define Colloids.
9. State types of electron microscope.
10. Define field emission.
11. Give one disadvantage of SEM.
12. What is the advantage of using electron in microscopy?

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B.Sc. Semester-5 Examination

SE 305

Physics (C)

Time : 2-30 Hours] **March-2024** **[Max. Marks : 70**

Q.1(a) Explain the primitive data types of C++. (7)

OR

(a) Write a program to input data and display with class and objects. (7)

(b) Write the advantages of Object Oriented Programming C++. (7)

OR

(b) Write a program to convert and display temperature in Fahrenheit to Celcius. (7)

Q.2(a) Write a note on Multiple Constructors in a class. (7)

OR

(a) Write a note on function overloading. (7)

(b) Write a C++ program to add amount data in rupees and paise format. (7)

OR

(b) Write a C++ program to calculate sum of first 50 natural numbers. (7)

Q.3(a) Explain Exception Handling with keywords 'throw', 'catch' and 'try'. (7)

OR

(a) Write a program to add distance data in meters and centimeters format. (7)

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(b) Write a note on deconstructors. (7)

OR

(b) Write a program for function overloading for function volume() of cube and cylinder. (7)

Q.4(a) Explain the private number function with suitable example. (7)

OR

(a) Write a C++ program to display string in triangle 'COMPUTER'. (7)

(b) Explain the open() function with its different modes. (7)

OR

(b) Write a program for arithmetic operator (+) overloading to add time in Hours and Minutes. (7)

Q.5 Answer in short (Any Seven) (14)

(i) Which data types are used to declare array value?

(ii) What is the default extension of a C++ program?

(iii) How do you declare constants in C++?

(iv) Which function is a must in every C++ program?

(v) Which operator is called scope resolution operator?

(vi) State the arithmetic operators in C++?

(vii) What is the default destructor in C++?

(viii) What is a friend function in C++?

(ix) Which character is used for directivity?

(x) Which header file is used for standard input output?

(xi) Which identifier is used for character value?

(xii) Which operators are not overloaded?