74

S.No.: 178 BATCH: 2014, 2017 Reg.No.:

END OF SEMESTER EXAMINATIONS, NOVEMBER - 2018
ELECTIVE – I:THIN FILM PHYSICS & NANO SCIENCE
SUBJECT CODE: 17P3PH08

MAJOR: M.Sc.,(PHYSICS) SEMESTER : II
TIME : 3 HOURS MAX.MARKS : 70

SECTION – A (10 X 1 = 10)

Answer All the questions:

Choose the correct answer:

1. What is flash evaporation?

2. Film thickness can be evaluated from the relation _____
   a) $t = \frac{WA}{\rho}$ b) $t = \frac{W}{\rho A}$ c) $t = \frac{\rho}{WA}$ d) $t = \frac{\rho A}{W}$

3. What is a phase transition?

4. How many stages of growth are there for single crystal substrates?
   a) 5 b) 3 c) 4 d) 6

5. Fullerenes, which is one of the allotropes of carbon have atleast ____carbon atoms.
   a) 60 b) 30 c) 90 d) 40

6. Quantum dot is a tiny semiconductor having diameter in the range of _____ nm.
   a) 3 to 11 b) 2 to 11 c) 2 to 8 d) 3 to 10

7. Write down any two limitations of carbon nanotubes.

8. Give any two uses of nanowires.

9. Give the basic principle of SEM.

10. Nanobots are robots which can be used effectively for
    a) Drug delivery b) AIDS c) Cancer d) Diabetics

SECTION – B (5 X 4 = 20)

Answer All the questions:

11. a) Describe the thermal evaporation method of thin film Preparation.
    (OR)
    b) Explain Vapour transporation and disproportionation method.

12. a) Write brief notes on epitaxy.
    (OR)
    b) Explain the substrate effect in thin film structures.

13. a) What are carbon nanotubes? Name the two types of carbon nanotubes.
    (OR)
    b) List the properties of nanomaterials.

..2.,

14. a) Write short notes on carbon nanotube fuel cells to store hydrogen and the type of materials used for hydrogen storage.

(OR)

b) Highlight the properties of carbon nanotubes.

15. a) Explain the principle of x-ray photoelectron spectroscopy .

(OR)

b) What is nanoelectronics? Give its advantages.

SECTION – C (5 X 8 = 40)

Answer All the questions:

16. a) Explain thermal decomposition and vapour phase reaction by chemical vapour deposition method.

(OR)

b) Describe the mass methods of microbalance technique and crystal oscillator.

17. a) Describe the various growth stages of thin films with appropriate illustrations.

(OR)

b) Explain the ellipsometry method to measure the thickness of surface layers of films and their optical constants.

18. a) Describe the Sol-gel synthesis method.

(OR)

b) Explain carbon nanomaterials in details? Highlight their properties and features.

19. a) Explain the production, structure and uses of nanowires.

(OR)

b) Describe the health and environmental impact of nanomaterials and carbon nano tube fuel cells to store hydrogen.

20. a) Describe in detail, the principle and working of transmission electron microscope with a neat schematic diagram.

(OR)

b) Write short notes on plastic solar cells.

* * * * *