D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE – 1
SEMESTER EXAMINATIONS
APRIL – 2016   15CAPH2A
ALLIED : PHYSICS - II

Time: 3 Hrs   **Max. Marks: 75**

SECTION – A (10 X 2 =20)

Answer ALL the questions.

1. Why is the wave nature of matter not noticeable in our daily observations?

2. What was G. P. Thomson's experiment to reveal the wave nature of electrons?

3. Define mass – energy equivalence.

4. What is nuclear medicine?

5. Define primitive cell.

6. Graph the plane and determine the axis intersects of a surface with the Miller index (013).

7. What is the physical meaning of numerical aperture of an optical fiber?

8. Sketch the graded index fiber.

9. Simplify: C + BC.

10. Why IC capacitor cannot be prepared by monolithic technology?

SECTION – B (5 X 5 =25)

Answer any FIVE of the following questions.

11. Illustrate the uncertainty in measuring position and momentum of an electron.

12. Describe the method of radiocarbon dating.

13. What is the crystal structure of NaCl? Sketch the crystal structure of NaCl.

14. With a neat sketch compare and contrast the single mode and multimode fibers.

15. State and prove Demorgan's theorem.

16. List all Bravias lattices for every crystal system.

17. What are the conditions required for total internal reflection to take place? With a neat sketch depict how the total internal reflection takes place in a fiber?

18. What are Flip Flops? Sketch and give the truth table of a J K Flip Flop.

SECTION – C (3 X 10 =30)

Answer ALL the questions.

19. a) Describe the G.P. Thomson's experiment.

(Or)

b) What is the process of transmutation? How do transmutation changes one element into another? Describe the (α, P) and (α, n) reactions with suitable nuclear equations.

20. a) State and derive the Bragg's law. What are the applications of Bragg's law?

(Or)

b) Define fiber optic communication. Give the block diagram of a fiber optic communication system. Mention the merits and demerits of this communication.

21. a) What are integrated circuits ? Discuss in detail the various steps involved in fabricating a semiconductor transistor by monolithic technology.

(Or)

b) Why NAND and NOR gates called universal gates? Prove the universality of these gates.

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