Physics

Reg.No. : ☐☐☐☐☐☐

I.Answer all the questions.

II.Use Blue pen only.

Time : 01:30:00 Hrs

Total Marks : 95

Part-A

5 x 1 = 5

1) In an X-ray tube,the intensity of the emitted X-ray beam is increased by

(a) increasing the filament current (b) decreasing the filament current (c) increasing the target potential (d) decreasing the target potential

2) Maser materials are

(a) diamagnetic ions (b) paramagnetic ions (c) ferromagnetic ions (d) non-magnetic ions

3) A three-dimensional image of an object can be formed by

(a) antomic spectroscopy (b) holography (c) molecular spectroscopy (d) Maser

4) When an electric field is applied to an atom each of the spectral lines split into several lines.This effect is known as

(a) Zeeman effect (b) Stark effect (c) Raman effect (d) seebeck effect

5) The low pressure of air needed for the discharge of electricity to pass through the gases is............ mercuric pressure

(a) 10mm (b) 100mm (c) 1mm (d) 0.1mm

Part-B

5 x 3 = 15

6) What are the drawback of sommerfled atom model?

7) Write the conditions to achieve laser action.

8) What is hologram?

9) What are the basic requirements for production of X-rays?

10) Give any four properties of cathode rays.

Part-C

3 x 5 = 15

11) Obtain the equation $2\,d\sin\theta = n\lambda$ X-rays in Coolidge tube.

12) Explain the production of X-rays in Coolidge tube.

13) Explain spectral series of hydrogen.

Part-D

6 x 10 = 60

14) a) Draw a neat sketch of Ruby laser. Explain its working with the help of energy level diagram.

(OR)

b) Draw a neat diagram of He-Ne laser and explain its working with the help of energy level diagram.

15) a) Prove that the energy of an electron of hydrogen atom in n^{th} orbit is, $E_n = \frac{-me^4}{8\varepsilon_0^2 n^2 h^2}$

(OR)

b) Explain the spectral series of hydrogen atom.

16) a) Explain the Milliken's Oil Drop Experiment to determine the charge of an electron.

(OR)

b) Obtain the expression for the radius of the nth orbit of an eletron based on Bhor's theory.

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