

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name: Modern Physics

Subject Code: 4SC03PHE1

Branch: B.Sc(All)

Semester: 3 Date: 15/12/2015 Time: 2.30 To 5.30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1 Attempt the following questions: (14)

- a) Define : Cantilever
- b) Give the definition of the turbulant flow.
- c) What is inertial frame?
- d) State any one postulate in which the special theory of relativity based?
- e) Draw only the graph of combine effect of absorption and fluroscense with respect to intensity and wavelength.
- f) What is Auger effect?
- g) Define: Fluroscence
- h) Enlist the names of types of spectra.
- i) Give the formulla of X-ray diffraction by Bragg's law.
- j) Which quantum number shows the size as well as shape of the orbit.
- k) What is Stark effect?
- l) Give the difference between normal Zeeman effect and Anamolous Zeeman effect.
- m) Define: Microscopic state.
- n) Give the statement of Liouville's theorem.

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions

- 1 Explain bending moment of a beam with neat and clean diagrams. Also derive formula for the same. **7**
- 2 Explain Michelson and Morley experiment for special theory of relativity **7**



Q-3	Attempt all questions	
1	A metal bar 10^{-2}m^2 in cross section and 0.8 m long is firmly clamped horizontally at one end and a weight of 1.6 kg is applied at the free end. calculate the depression produced.	5
	The value of young modulus of the material is $= 9.9 \times 10^{10}\text{Nm}^{-2}$	
2	Explain with diagram cantilever supported at its end and loaded in the middle with necessary formula.	5
3	Explain: Stoke's law.	4
Q-4	Attempt all questions	
1	Explain Production of X-ray with neat and clean diagram.	7
2	Explain X-ray diffraction by Bragg's law.	7
Q-5	Attempt all questions	
1	Write a note on : Absorption spectrum	5
2	Explain about J-J coupling.	5
3	What is Auger effect? Explain.	4
Q-6	Attempt all questions	
1	Explain each quantum number with their physical interpretation.	7
2	Explain about : L-S coupling	7
Q-7	Attempt all questions	
1	Explain : Zeeman effect.	7
2	Explain about the Gibb's Paradox.	7
Q-8	Attempt all questions	
1	Explain about the term: Equal a priori probability	5
2	Explain about the specific heat at constant volume.	5
3	What is microcanonical ensemble? Explain.	4

