Gurudas College (CU)

Internal Examination 2020

B.Sc Semester –II

Physics Hons (PHSA) Practical

Paper – CC4

Full Marks: 15 **Time: 1 Hour**

Answer ***any one question*** from below.

1. To determine the frequency of electrically maintained tuning fork by means of Melde's apparatus in transverse mode of vibration.
   a) Working formula. 2
   b) Data for transverse mode of vibration.

Total mass M (gm)	No. of loops (p)	Loop length (l) cm
50	5	75
	4	60
55	5	80
	4	64
60	5	85
	4	68

   i) Construct table for λ^2-T graph where $\lambda=2l/p$ and T=Mg tension. 5
   ii) Plot λ^2-T graph. 6
   iii) Calculate frequency from the graph. 2

2. Determination of radius of curvature of the lower surface of a plano convex lens using Newton's ring apparatus.

   a) Working Formula. 2

   b) Table for determination of diameter D of the Newton's rings for different order.

Ring number	Reading of the microscope for the	
	Left end of the ring (cm)	Right end of the ring (cm)
P+21	3.64	3.07
P+15	3.60	3.15
P+9	3.55	3.19
P+3	3.46	3.22

   i) Construct table to plot D^2 verses ring number plot. 5

   ii) Plot D^2 verses ring number. 6

   iii) Calculate the radius of curvature of the plano convex lens. (given wavelength of the source light, λ=5893 A^O) 2

3. To draw curve connecting refractive index μ of a given material of a prism verses $(1/\lambda^2)$ for lights of known wavelengths (λ) to verify Cauchy's formula $\mu=a+b/\lambda^2$ and to determine the constants a and b.

   a) Working formula to find refractive index. 2

   b) Table for minimum deviation for known wavelengths.

Color of light	Wavelengths λ (nm)	Minimum deviations
Red	623	48^0 43'
Yellow	579	$49^0$09'
Green	546	49^0 32'
Blue	436	51^0 23'

   i) Construct table for refractive index μ verses $1/\lambda^2$ plot. 5
   (Angle of prism A=60^o)

   ii) Plot refractive index μ verses $1/\lambda^2$ and comment on verification of Cauchy's formula 5+1

   iii) Calculate a and b constants of Cauchy's formula from the graph. 2