Jahangirnagar University

Department/Institute: Information Technology

Masters/Honours 1st **year Final Examination-2019**

Course No.# ICT-1107

Course Title# Physics

Examination Roll No. # 19 23 40

Registration No. # 2019365 0283

Academic Session # **2018- 2019**

Total no of written pages in the script # 7

Date: , 2021, Aug, 01

Instructions:

1. Examinee must write his/her exam roll no. and page no. at the top of every page of the script.
2. Do not write your name or any identification mark anywhere of the script.
3. Total time for exam is 45 minutes. You will get 15 additional minutes for submission.
4. Delay in submission is not acceptable.
5. You have to submit your exam script in PDF format.
6. The examinee must submit the examination script **through online (Google classroom/email/google form etc.)** as prescribed by the examiner.
7. You must use **your EXAM ID** only for naming your submitted file.
8. After completing the exam, you must write the total number of pages used for the exam in the top sheet.

2021/8/1 10:52

Roll-19 23 40

Answer to the question no-1

a. Sound intensity also know as acousti-intensity is defined as the Power carried by sound wave Per unit area in a direction Perpendicular to that area.

Acoustic intensity is defined as the variation of the energy flux Produced by the acoustic Perturbation. ~~The en~~

Acoustic Intensity level:

Intensity of sound is a Physical quantity while the loudness is merely a degree of sensation.

The loudness Produced is Proportional to the Logarithm of Intensity:

$$S \propto \log I$$

$$S = k \log I$$

Souppose S is the loudness at an intensity I and S_0 is that for an intensity I_0

$$IL = S - S_0$$

$$= k \log_{10} I - k \log_{10} I_0$$

when IL is measured in decibels the the acoustic intensity level is

$$IL = 10 \log_{10} \left(\frac{I}{I_0}\right) dB$$

The standard acoustic intensity reference

$$I_0 = 10^{-12}$$

$$IL = 10 \log_{10} \left(\frac{1}{10^{-12}}\right) dB$$

$$IL = 10 \left[\log_{10} I + 120\right] dB$$

Roll-192340

Acoustic Pressure level :

When the Presure level is measured in decibel then the accoustic Pressure level is written as

$$PL = 10 \log_{10} \left(\frac{P}{P_0} \right)^2 dB$$

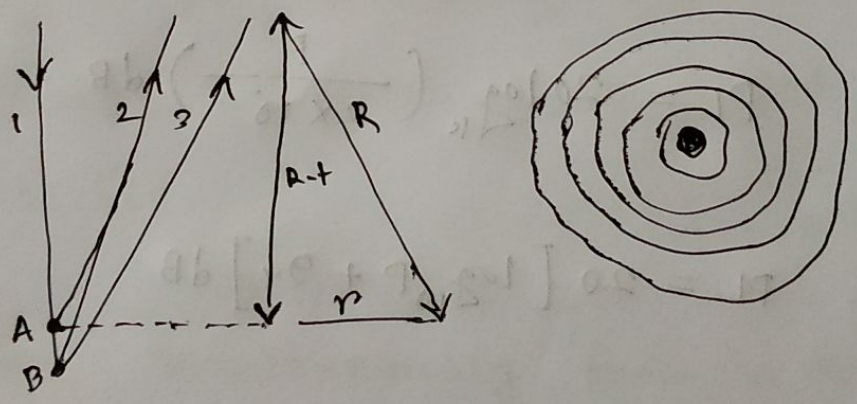
The standand acoustic intensity reference

$P_0 = 2 \times 10^{-5} \ N+m^{-2}$

$$PL = 20 \log_{10} \left(\frac{P}{2 \times 10^{-5}} \right) dB$$

$$PL = 20 \left[\log_{10} P + 94 \right] dB$$

b. The locus of the light passing through the lens of equal intensity depends upon the thickness of the air gap between the lens and the glass plate. Since the air film thickness is constant in the shape of a circle Hence the newton rings formed are circular in shape.



For the given image the air film thickness AB is constant in a circle around the lens hence the rings formed an circule.

Roll – 192340

Answer to the question no – 3

a. the entropy of the universe increases because energy never flows uphill spontaneously.

1. Energy always flows downhill and this causes an increse of entropy.

2. Entropy is the spreading out of energy and energy tends to spread out as much as possible.

3. If flows spontaneously form a hot region to a cold region.

4. As a result energy becomes evenly distributed across the two regions and the tempenature of the two regions becomes equals.

Roll – 192340

b. In the first case

$\eta = 25\%$

$= 0.25$

$T_2 = 25^\circ C$

$= 25 + 273\ K$

$= 298\ K$

We know

$$\eta = 1 - \frac{T_2}{T_1}$$

$$T_1 = \frac{T_2}{1-\eta}$$

$$= \frac{298}{1-0.25}$$

$$= 397.33\ K$$

Second case

$\eta = 35\%$

$= 0.35$

$$\eta = 1 - \frac{T_1}{T_2}$$

$\Rightarrow$ ~~T_2~~

Roll - 19 23 40

$$\Rightarrow 0.35 = 1 - \frac{298}{T_2}$$

$$\Rightarrow T_2 = 458.46\ K$$

$$\Delta T = 458.46 - 347.3$$

$$= 60.86\ K$$

we can Increase high resonroin tempreture by 60.8K K to reach our desned 35%. efficiency tanget.