Darshan University – School of Engineering

Bachelor of Technology – Semester I
Mid Semester Examination

Course Code	: 21HS01103		**Exam Date**	: 13/12/2021
Course Name	: Physics		**Total Marks**	: 30
Time	: 11:30 am to 12:45 pm		**Enrollment No.**	:_____

Instructions
1. Attempt **all** the questions.
2. Figure to the right indicate maximum **marks**.
3. Don't do any kind of **rough** work or **calculation** in Question Paper.
4. **Make** suitable assumptions whenever necessary.
5. The text to the right-side of the marks indicates the Bloom's Level **(BL*)** of the question followed by the Course Outcome **(CO).**
   i.e. R: Remembrance, **U:** Understanding, **A:** Application, **N:** Analyze, **E:** Evaluate, **C:** Create.

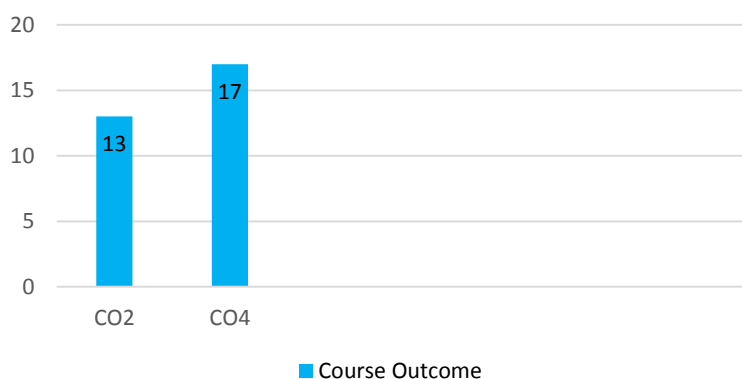| Course Outcomes (COs)	At the end of this course, students will be able to: CO2: **solve** the problems based on ray theory. CO4: **determine** parameters related to acoustic and ultrasonic wave.

Q. No.		Question	Marks	BL*	CO
Q. 1	(A)	What do you mean by acceptance angle of a fiber? Derive its expression.	03	U	CO2
	(B)	What is piezoelectric method for production of ultrasonic wave? Give its construction, working, and advantage & disadvantage.	07	U	CO4
Q. 2	(A)	Briefly describe the construction of a fiber optic cable.	03	U	CO2
	(B)	Give difference between step index fiber and graded index fiber.	03	U	CO2
	(C)	A silica optical fiber has a core of refractive index 1.55 and a cladding of refractive index of 1.47. Determine **(i)** the critical angle at the core cladding interface **(ii)** the numerical aperture for the fiber and **(iii)** the acceptance angle in air for the fiber.	04	A	CO2
		OR			
Q. 2	(A)	Discuss in detail the principle of optical fiber communication.	03	U	CO2
	(B)	Explain internodal dispersion, why it does not exist in SMF?	03	U	CO2
	(C)	An optical fiber has NA of 0.15 and a cladding refractive index is equal to 1.50. Find the NA and acceptance angle of the fiber in a liquid of refractive index 1.30.	04	A	CO2
Q. 3	(A)	Briefly describe characteristics of sound.	03	U	CO4
	(B)	What is meant by reverberation time? Discuss Sabine's formula.	04	U	CO4
	(C)	Calculate the intensity level in dB at a distance of 15 m away from source which radiates energy at the rate of 3.56 W. The reference intensity (I_0) is 100 Wm^{-2}.	03	A	CO4

		OR			
Q. 3	(A)	Explain Kundt's tube method.	03	U	CO4
	(B)	Write properties of ultrasonic wave.	04	U	CO4
	(C)	The area of interior surface of an auditorium is 3340 m². Its reverberation time is 1.5 second. If the average absorption coefficient of interior surface is 0.4 Sabine, find the volume of an auditorium.	03	A	CO4

Bloom's Level wise Marks Distribution
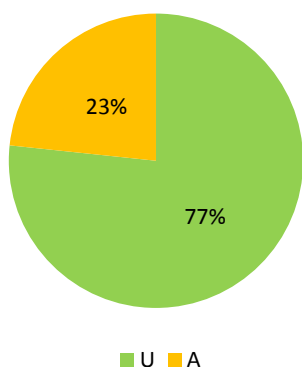
Course Outcome wise Marks Distribution

✽ ✽ ✽ ✽ ✽ ✽ ✽ ✽ ✽ ✽