Hall Ticket Number:

Code No. : 12522 N

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. II-Semester Main Examinations, August-2023

Engineering Physics

(Mech. Engg.)

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What are the conditions to observe Interference pattern with good contrast	2	1	1	1,12
2.	Write any four differences between Ordinary ray and Extraordinary ray.	2	2	1	1,10
3.	Mention few applications of Laser in Mechanical Industry.	2	3	2	1,12
4.	A step indexed fiber has a core of refractive index 1.5. If the numerical aperture of the fiber is 0.26, calculate the refractive index of cladding.	2	3	2	1,2,12
5.	A hall has the volume of 7500 m^3. What should be the total absorption in the hall if the reverberation time of 1.5 s is to be maintained?	2	3	3	1,10
6.	Mention any four properties of ultrasonic waves.	2	1	3	1,12
7.	How ferro magnetic materials are different from ferri magnetic materials?	2	2	4	1,1012
8.	A superconducting tin has a critical temperature of 3.7K at zero magnetic field and a critical field of 0.0306T at 0K. Find the critical field at 2K.	2	3	4	1,12
9.	Show that Enthalpy remains constant during Joule Thomson's expansion	2	1	5	1,12
10.	List out few applications of Cryogenic fluids.	2	2	5	1,10,12
	Part-B (5 × 8 = 40 Marks)				
11. a)	Prove that the diameter of the n^{th} dark ring in a Newton's ring experiment is directly proportional to the square root of the ring number	4	3	1	1,2 10
b)	Derive an expression for the intensity distribution due to Fraunhofer diffraction at a single slit.	4	3	1	1,2,10
12. a)	Draw a neat diagram of He – Ne Laser and its energy level diagram and describe its method of working.	4	1	2	1,2,12
b)	Discuss how light is propagated through optical fiber and derive an expression for Numerical aperture and acceptance angle.	4	3	2	1,2,12
13. a)	Deduce Sabine's formula for the reverberation time of an auditorium.	4	3	3	1,2,10

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b)	What are ultrasonic waves? Describe the construction and working of piezo electric oscillator using circuit diagram.	4	1	3	1,10,12
14. a)	Identify the differences between soft and hard magnetic materials.	4	2	4	1,10,12
b)	Discuss various properties of superconductor in superconducting state.	4	2	4	1,10,12
15. a)	State and explain Joule Thomson's Effect.	4	2	5	1,10,12
b)	Explain the process of regenerative cooling used to produce low temperatures.	4	2	5	1,10,12
16. a)	Describe the principle, construction and working of Nicol Prism.	4	2	1	1,10,12
b)	Distinguish between spontaneous and stimulated emissions.	4	3	2	1,12
17.	Answer any ***two*** of the following:				
a)	Examine the various factors affecting the acoustics of building and give their remedies.	4	3	3	1,12
b)	Differentiate between TYPE – I and TYPE – II superconductors.	4	2	4	1,10,12
c)	How adiabatic demagnetization can be used to produce low temperatures less than 1K? Explain.	4	2	5	1,10,12

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	17.5%
ii)	Blooms Taxonomy Level – 2	42.5%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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