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Code No. : 12522 AS N

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. II-Semester Advanced Supplementary Examinations, September-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.	Define diffraction. Write down an expression for resultant intensity of light passing through a single slit of width a . λ is the wavelength of the light used.	2	1	1	1,12
2.	Calculate the radius of the 10 th dark ring when light with a wavelength of 600 nm is used. The radius of curvature of the plano-convex lens is 0.5 m.	2	3	1	1,10
3.	Define coherence. Give an example for coherent source.	2	1	2	1,12
4.	What is the difference between single-mode and multi-mode fibers?	2	1	2	
5.	An auditorium with a volume of 5000 cubic meters has a reverberation time of 2.5 seconds. If the average absorption coefficient is 0.1, find the total absorption area.	2	1	3	1,2,12
6.	Mention any four applications of ultrasonic waves in industry.	2	1	3	1,12
7.	Draw hysteresis curves of soft and hard magnetic materials and mark coercivity and remanence.	2	2	4	1,10,12
8.	What is the difference between a normal conductor and superconductor?	2	2	4	1,12
9.	Write van der Waals gas equation and what happens to the temperature of a van der Waals gas during the Joule-Thomson process?	2	2	5	1,12
10.	What is the basic principle used in adiabatic demagnetization?	2	1	5	1,10,12
Part-B (5 × 8 = 40 Marks)					
11. a)	Discuss interference due to thin film and get the conditions for constructive and destructive interference.	5	2	1	1,2,10
b)	A diffraction grating has 2000 lines per centimeter. Determine the angle of the first-order maximum for a visible light of wavelength 550 nm.	3	3	1	1,2,10
12. a)	What is the gain medium in a ruby laser? Explain, how does a ruby laser work to produce a LASER beam?	5	2	2	1,2,12
b)	A single-mode fiber has a core with a refractive index of 1.49 and a numerical aperture of 0.12. Calculate the maximum acceptance angle of the fiber.	3	3	2	1,2,12

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13. a)	What is reverberation time and explain how Sabine derived an expression for reverberation time.	5	4	3	1,2,10
b)	What is SONAR and explain its working principle.	3	3	3	1,10,12
14. a)	What is the role of the molecular field in the Weiss theory and how does the Weiss theory explain spontaneous magnetization in ferromagnets?	4	2	4	1,10,12
b)	Write the note on SQUID and Josephson junction.	4	1	4	1,10,12
15. a)	What is the Joule-Thomson effect and what is the significance of the Joule-Thomson coefficient in the porous plug experiment?	4	2	5	1,2,12
b)	Explain how Hydrogen can be liquefied by using the principle of Joule Thomson effect.	4	4	5	1,10,12
16. a)	Describe the construction and working of Nicol Prism.	4	3	1	1,10,12
b)	Briefly explain the primary sources of signal loss in optical fibers.	4	2	2	1,10,12
17.	Answer any <i>two</i> of the following:				
a)	How are sound-absorbent materials different from soundproofing materials?	4	3	3	1,12
b)	What is Meissner effect? How do Type-I and TYPE - II superconductors react to external magnetic fields?	4	2	4	1,10,12
c)	How does regenerative cooling work in the process of liquefaction of a gas?	4	4	5	1,10,12

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

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	40%
iii)	Blooms Taxonomy Level - 3 & 4	40%
