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Question Paper Code	12925
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

First Semester

**Civil Engineering**

(Common to All Branches)

**20BSPH101 - ENGINEERING PHYSICS**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	Marks	K- Level	CO
1. What are Bravais lattice?	2	K1	CO1
2. Tell the meaning of polymorphism and allotropy.	2	K2	CO1
3. What are the conditions for LASER action?	2	K2	CO2
4. Find the wavelength of light emitted by Ga-As Laser with band gap energy of 1.44 eV.	2	K2	CO2
5. Explain intermodal dispersion is and how it is reduced by using a GRIN fiber.	2	K2	CO3
6. Define the term attenuation.	2	K2	CO3
7. Explain the term neutral axis.	2	K2	CO4
8. Describe an I-shaped girder.	2	K2	CO4
9. Define an expansion joint? List out their types.	2	K2	CO6
10. Identify the uses of solar power.	2	K2	CO6

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Describe the BCC and FCC structures and derive the No. of atoms, Co-ordination number, atomic radius and packing factor.	13	K2	CO1
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**OR**

b) Explain the two melt growth techniques:-			
i) Czocharalski's method.	7	K2	CO1
ii) Bridgeman method.	6	K2	CO1
12. a) i) List out the population techniques and explain it.	6	K2	CO2
ii) Summarize the homo-junction laser with suitable diagram.	7	K2	CO2

**OR**

b) Describe with a neat sketch the principle, construction and working of a CO <sub>2</sub> laser.	13	K2	CO2
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13. a) Explain how optical fibers are classified. Discuss their characteristics features. 13 K2 CO3

**OR**

b) Explain the working of temperature and displacement sensors in detail. 13 K2 CO3

14. a) i) Deduce an expression for the couple to produce a unit twist in a long cylindrical wire fixed at one end. 8 K2 CO4

ii) Explain factors affecting elasticity. 5 K2 CO4

**OR**

b) Explain the term cantilever? Obtain an expression for the depression at the loaded end of cantilever whose other end is fixed as summing that its own weight is not effective in bending. 13 K2 CO4

15. a) Describe Lee's disc method for determining thermal conductivity of bad conductors. 13 K2 CO6

**OR**

b) Derive the expression for effective thermal conductivity through compound media in series and parallel. 13 K2 CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) Derive Planck's law for black body radiation and hence deduce Wien's displacement law and Rayleigh– Jean's law. 15 K2 CO5

**OR**

b) Explain the principle, construction, working and applications of Scanning Tunneling Microscope. Also mention its advantages and disadvantages. 15 K2 CO5