BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

B. Tech. Sem - I COMPUTER SCIENCE & BUSINESS SYSTEMS : SUMMER : 2024

SUBJECT: PHYSICS FOR COMPUTING SCIENCE

Day : Thursday
Date : 16/05/2024

S-24134-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data **WHEREVER** necessary.
4) Draw neat diagrams **WHEREVER** necessary.

Constants:

$e = 1.6 \times 10^{-19} C$

$m_e = 9.1 \times 10^{-31} Kg$

$h = 6.63 \times 10^{-34} J - s$

$m_p = 1.66 \times 10^{-27} Kg$

$N_a = 6.025 \times 10^{23} atom / gm - mole$

Q.1 Derive the formula for stiffness in a spring-mass system where two springs are connected in series and parallel. **(10)**

OR

Q.1 Explain the oscillation in an LCR circuit when capacitor, inductor and resistor are connected parallel. Set the differential equation when excited by an a.c. voltage. **(10)**

Q.2 With experimental setup, explain the formation of Newton's rings. Explain the features of rings. **(10)**

OR

Q.2 Derive the formula for intensity distribution when light is diffracted at a single slit. Calculate the width of principal maxima when light wavelength 580 nm is diffracted from slit of with 1mm. **(10)**

Q.3 Derive the formula for energy eigen value for particle trapped in an infinite potential well of length L. **(10)**

OR

Q.3 State and explain Heisenberg's uncertainty principle. **(10)**
If uncertainty in location is equal to its De-Broglie wavelength. Prove that $\Delta v = v$.

Q.4 What is packing Factor? **(10)**
Derive the packing factor for simple cubic and BCC.

OR

Q.4 What is energy band? Explain the formation of energy bands in solids. **(10)**

Q.5 What are Einstein's A and B coefficients? Derive a relation between them. **(10)**

OR

Q.5 With energy level diagram, explain the construction and working of Nd-YAG laser. **(10)**

Q.6 What is Carnot Engine? Explain Carnot cycle. **(10)**

OR

Q.6 What is entropy? Derive formula for entropy in reversible and irreversible process. **(10)**

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