JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

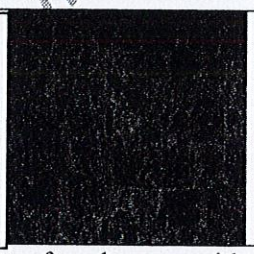
B.Tech-V Semester (CSE/ECE)

COURSE CODE (CREDITS):25B1WPH533 (3) MAX. MARKS: 15

COURSE NAME: PHYSICS OF FUNCTIONAL MATERIALS AND DEVICES

COURSE INSTRUCTOR:SKT MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems (c) Use of calculator is not allowed*

Q.No	Question	CO	Marks
Q1	What is Alloy? Explain the temporal evolution of alloying of Al & Cu, using phase field model and interfaces. Give appropriate expression of free energy functional, entropy, and internal energy.	**3**	**3**
Q2	The given figure is actual representation of JUIT wall, supposes water is flowing/ absorbed across the boundary. Explain the phenomenon of detachment using sharp interface model in phase field. 	**2**	**3**
Q3	Name the different average molecular weight of polymer with appropriate formula. Suppose you want to develop photo-chromatic glass, which type of polymer you will choose and why?	**4**	**3**
Q4	What engineering and materials parameters would you need to consider in creating wearable, long lasting, and monitoring device.	**5**	**2**
Q5	Explain the following observed experimental facts. (a) Why the temperature dependent conductivity of copper is different from TiO_2 ? (b) The band gap of bulk CdSe is 1.7 eV, when the same material is converted into nanostructure, it' band gap increases from 1.7 eV to 2.5 eV. (c) Design and working principle of device to monitor the exhaust gases from an internal combustion engine	**1**	**1+1+2=4**

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