JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- February 2018

B.Tech II Semester (CSE, ECE, IT)

COURSE CODE: 10B11PH211   MAX. MARKS: 15

COURSE NAME: PHYSICS-II

COURSE CREDITS: 04   MAX. TIME: 1Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Attempt all the questions in sequence.

Q1.

   a) Check the divergence theorem for the function $\vec{A} = y^2\hat{\imath} + (2xy + z^2)\hat{\jmath} + 2yz\hat{k}$ and a cube of side 1 unit situated at origin   **[3]**

   b) The height of a certain tower is given as $h\ (x,y) = 10\ (2xy - 3x^2 - 4y^2 - 18x + 28y + 12)$, where y is the distance north and x the distance east. (i) Where is the top of the tower located? (ii) What is the height of the tower?   **[2]**

Q2.

   a) Determine the electric field caused by a spherical clued of electrons with a volume charge density $\rho = -\rho_o$ for $0 \leq R \leq r$ and $\rho = 0$ for $R > r$, using Gauss law.   **[3]**

   b) Write down Laplace and Poisson's equations. Use them to find out the potential at any point between the two plates of a parallel plate capacitor separated by a distance 'd' and maintained at potentials 0 and V_o.   **[2]**

Q3.

   Write the Maxwell's electromagnetic equations. Using these drive the wave equation for electromagnetic waves in free space.   **[2+3]**