JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-I (SEPT-2022)

B.Tech (ECE/CSE/IT/CE)

COURSE CODE: 18B11PH211 TIME ALLOWED: 1HR

COURSE NAME: Engineering Physics-II

COURSE CREDITS: 4 MAXIMUM MARKS: 15

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.*

1. What is Coulomb Law and find the force on a charge Q_1 (20 μC) due to charge Q_2(-300 μC), Where Q_1 is at (0, 1, 2)m and Q_2 at (0, 0, 2) m. **(1+2)**

2. Find the expression for the electric field at P(x,y,z) due to a point Charge Q at (x_1,y_1,z_1). What will be electric field if charge is at origin? **(2+1)**

3. Find the gradient of the following scalar functions:
   - $T = 3/(x^2+z^2)$, (b) $V = xy^2z^4$, (c) $U = z\cos\phi/(1+r^2)$, **(1+1+1)**

4. What is gauss law and what is relation between flux density and electric field intensity. **(2)**

5. Find Divergence of the following vector Functions

   $A = r\sin\theta\hat{r} + 2r\cos\theta\hat{\theta} + 2z^2\hat{z}$

   $A = \frac{5}{r^2}\hat{r} + \frac{10}{\sin\theta}\hat{\theta} - r^2\varphi\sin\theta\hat{\varphi}$ **(1+1)**

6. Find Curl of the following vector Functions at (2, 2, 0)

   $A = \hat{i}x^2 + \hat{j}yz + \hat{k}xy$

   $A = \hat{i}\frac{1}{\sqrt{x^2+y^2}}$ **(1+1)**