

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 MAKEUP EXAMINATION - April 2018

B.Tech IV Semester

MAX. MARKS: 25

COURSE CODE: 17B11EC411

COURSE NAME: Electromagnetic Engineering

MAX. TIME: 1HR 30Min

COURSE CREDITS: 04

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume any missing data. Each question carries five marks.

1. Find the capacitance per unit area for two infinite parallel plates separated by d units using the Laplace's equation. The medium between the two plates is filled with a dielectric material of relative dielectric constant ϵ_r .
2. Derive the expression for magnetic field intensity at the point $(0, 0, 10)$ if there is an infinite current carrying conductors kept at and $y = +10$ (x -is varying from infinity to infinity). The direction of current is in the positive x -direction.
3. If $H = xyza_x + (x + y + z)a_y + za_z A/m$, verify the Stokes theorem for the area $0 < x < 1$ and $0 < y < 2$.
4. The interface between two magnetic media is given by $y + z = 1$. Medium-1 ($\mu_{r1} = 10$) is present for $y + z > 1$ while medium-2 ($\mu_{r2} = 20$) is present for $y + z < 1$. If there is a uniform sheet current density of $10a_x mA/m$ exists on the interface, find H_2 if $H_1 = 2a_x + 3a_y + 4a_z mA/m$.
5. Write in brief about the following.
 - a. Maxwell's Equations in point form.
 - b. Force on a current carrying conductor due to magnetic field.
 - c. Electrical boundary conditions at the interface between two dielectrics.
 - d. Capacitance determination
 - e. Scalar magnetic potential.