Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY

FACULTY OF APPLIED SCIENCE

B.Sc., Summer 2017-18 Examination

Semester: 3 **Date: 29/05/2018**
Subject Code: 11104202 **Time: 10:30 am to 1:00 pm**
Subject Name: Electricity and Magnetism **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Essay type/ Brief note (4x2) (Each of 04 marks) **(08)**
(a) Explain LC tank Circuit.
(b) Derive the equation of continuity.

Q.1. B) Answer the following questions (Any two)
(a) Brief note: **(04)**
1. State Kirchoff's first and second law.
2. State Biot-Savart and Ampere's circuital law.
(b) Explain Polarization of dielectric and derive the equation of displacement field. **(04)**
(c) Short note **(04)**

Q.2. A) Answer the following questions.
(a) Brief note: **(04)**
1. Define rotational and irrotational vector field.
2. Find Curl of $xyz\hat{\imath} + xyz\hat{\jmath} + xyz\hat{k}$ at (1,2,3)
(b) Explain Uniqueness theorem. **(04)**

Q.2. B) Answer the following questions (Any two)
(a) Short questions: **(03)**
1. Define linear charge density.
2. Define current density.
3. Draw the graph of Current VS. frequency for LCR series circuit.
(b) Derive the 2nd order differential equation of electric charge in LCR series AC circuit. **(03)**
(c) Explain the effect of conductor **(03)**

Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks) **(08)**
(a) Derive the equation of rise of electric current in RL circuit.
(b) Derive the equation of decay of electric charge in RC circuit.

Q.3. B) Answer the following questions (Any two)
(a) Brief note: **(04)**
1. Find grad of $f(x, y, z) = 2x^2 + 3y^2 + z^2$ at (2,1,3)
2. Write a short note on Q factor.
(b) Derive an equation $I = \int \vec{J} \cdot \overrightarrow{da}$ **(04)**
(c) Derive an equation of decay of electric current in RL circuit. **(04)**

Q.4. A) Answer the following questions.
(a) Short note: **(04)**
1. Write Laplace and Possion's equation.
2. Define polarization and polarziability.
(b) Derive the equation of electric field due to infinitely long straight charged wire by using Gauss's law. **(04)**

Q.4. B) Answer the following questions (Any two)
(a) Short Answers: **(03)**
1. Define drift velocity.
2 .Define relaxation time.
3. State Ohm's law.
(b) Explain resonance in details. **(03)**
(c) Derive the equation of electric potential of charged ring. **(03)**