Registration No :

Total Number of Pages : 01   **M.Sc.I**
                                                                                                 FPYE206

2nd Semester Back Examination 2018-19
PHYSICS-II
BRANCH : M.Sc.I(AC)
Time : 3 Hours
Max Marks : 70
Q.CODE : F367
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions :**   **(2 x 10)**
   a)   What is vector triple product?
   b)   State Gauss' law in electrostatics.
   c)   What are dielectrics? Define dielectric constant.
   d)   State Biot and Savart's law.
   e)   Give the physical significance four Maxwell's equations.
   f)   What is Q-factor?
   g)   What is half wave rectifier?
   h)   How does RC coupled amplifier work? Give its advantage.
   i)   What is Colpitt's oscillator?
   j)   Give the necessary criteria for maintenance of sustained oscillation in an
           electronic oscillator.

Q2 **a)** State and prove Stokes theorem.   **(5)**
       b) Deduce the differential form of Gauss law.   **(5)**

Q3 **a)** Using Biot and Savart's law, find the magnetic field due to a straight conductor   **(5)**
               of infinite length carrying current in a perpendicular distance from the
               conductor.
       b) State and prove Ampere's circuital law.   **(5)**

Q4 **a)** Find an expression for the decay of current in a circuit containing an   **(5)**
               inductance and a resistance.
       b) Find an expression for power in an AC circuit.   **(5)**

Q5 **a)** Draw the circuit diagram and explain the working of a full wave rectifier.   **(5)**
       b) Explain the principle of demodulation function and basic theory of linear diode   **(5)**
               detectors.

Q6   Determine the electric field of charges uniformly distributed over an infinite   **(10)**
           plane surface and spherically symmetric charge distribution using Gauss
           theorem.

Q7   Obtain an expression for the growth and decay current in RC circuits.   **(10)**

Q8   **Write short answer on any TWO :**   **(5 x 2)**
   a)   Gauss divergence theorem
   b)   Decay current in RC circuit
   c)   Hartley Oscillator