

Reg. No. :

D 1092

Q.P. Code : [D 07 PPH 05]

(For the candidates admitted from 2007 onwards)

M.Sc. DEGREE EXAMINATION, DECEMBER 2013.

Second year

Physics

ADVANCED ELECTRONICS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. (a) Explain FET as a Voltage Variable Resistor.
(b) Discuss the working of Tunnel Diode.
2. (a) Describe with circuit the working of OP-Amp as ADDER and SUBTRACTOR.
(b) Explain the working of Active Filters.
3. (a) Describe the I²L logic family.
(b) Write a note on charge coupled devices.

4. (a) Explain the working of phase shift oscillator.
(b) Describe the working of A/D convertor.
 5. (a) Derive the RADAR equation.
(b) Discuss the effect of noise on carrier in frequency modulation.
 6. (a) Analyse the behaviour of common source amplifier at high frequencies.
(b) Explain the use of solar cells in energy conversion and mention their uses.
 7. (a) Explain the working of JK Flip Flops and give truth table.
(b) Discuss about Read Only Memory (ROM) and Random Access Memory (RAM).
 8. (a) Outline the Eccless and Larmon theory of Ionosphere.
(b) Explain the working of Schmitt Trigger with neat circuit diagram.
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Second Year

Physics

CONDENSED MATTER PHYSICS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

Draw diagrams and write equations whenever
necessary.

(5 × 20 = 100)

1. (a) Discuss the principle of Neutron diffraction method. Mention its advantages.
(b) Explain Frenkel and Schottky defects.
2. (a) Derive London equation. Prove that it implies Meissner effect.
(b) Describe the Langevin theory of paramagnetism.

3. (a) Derive the Gibb's Thomson equation for solution.
(b) Discuss in detail about BCF theory for solution growth.
4. (a) Describe the Czochralski crystal puller and its working.
(b) Discuss the growth of potassium Titanyl phosphate.
5. (a) Derive Nernst relation.
(b) Describe the structure of the Gel.
6. (a) Explain in detail about Bridgman techniques with a diagram.
(b) Discuss the Non linear phenomena in KDP family crystals.
7. (a) Describe the structure of cap shaped nucleus.
(b) Draw the miller krumbhaar model and explain.
8. (a) Write notes on stationary temperature profiles of crystals.
(b) Explain the experimental procedure for the growth of crystals in gels.

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Second Year

Physics

ELECTRO DYNAMICS AND PLASMA PHYSICS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Derive Maxwell's equations
(b) Derive Bremsstrahlung radiation.
2. (a) Explain the motion of a charged particle in a magnetic field.
(b) Explain the time varying Electric and magnetic fields.
3. (a) Explain the fluid equation for plasma.
(b) Describe the hydromagnetic equilibrium.

4. (a) Describe the gravitational instabilities.
(b) Explain the plasma approximation.
 5. (a) Explain the theory – CMA diagram.
(b) Describe the plasma oscillations.
 6. (a) Derive the Fokker plank equation.
(b) Explain Landau damping.
 7. (a) Derive equation Lienard – Wiechart potential.
(b) Explain Cerenkov radiation.
 8. (a) Derive Lorentz transformation equation.
(b) Explain synchrotron radiation.
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D 1095

Q.P. Code : [D 07 PPH 08]

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M.Sc. DEGREE EXAMINATION, DECEMBER 2013.

Second Year

Physics

COMPUTATIONAL METHODS AND PROGRAMMING

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. (a) Find the smallest positive root of the equation $x^2 - 2x + 0.5 = 0$ using Newton Raphson method.
- (b) Derive an expression for solving differential equation by second order Runge-Kutta method.
2. (a) Write about finite difference method for solving partial differential equations.
- (b) Explain Monte Carlo simulation technique in detail.

8. (a) Write a note on *if-else* and *switch* statements.
- (b) Explain the various array editor and current directory in MATLAB.
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