

Reg. No. :

D 2104

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

(For the candidates admitted from 2007 onwards)

M.Sc. DEGREE EXAMINATION, MAY 2013.

Second Year

Physics

ADVANCED ELECTRONICS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. (a) Discuss FET as a VVR.
(b) Discuss the operation of Avalanche photodiode with a diagram.
2. (a) List the parameters of op amp and explain.
(b) With a circuit diagram explain the operation of OP amp as integrator and derive the expression for V_o .
3. (a) Explain the working of
 - (i) Up /down counters
 - (ii) Johnson counter with truth table.
(b) Write notes on ROM, PROM, EEPROM

4. (a) Describe the working of phase shift oscillator with circuit and mention its advantages.
(b) Draw the simple Sample/Hold system. Explain the function of each block and mention one of its real time application.
5. (a) Discuss about directional high frequency antennas.
(b) Outline ecles & larmor theory of Ionosphere.
6. (a) Derive RADAR equation.
(b) Draw the block diagram of black and white TV receiver and explain.
7. (a) Derive the various power relation in AM wave.
(b) Discuss the various pulse modulation techniques in detail.
8. (a) Discuss the operation of multicavity klystron with its circuit.
(b) Explain the working principle of tunnel diode with (V-I) plot.

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D 2105

Q.P. Code : [D 07 PPH 06]

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M.Sc. DEGREE EXAMINATION, MAY 2013.

Second Year

Physics

CONDENSED MATTER PHYSICS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions

(5 × 20 = 100)

1. (a) Describe Rotatory crystal method of X-ray diffraction.
(b) Explain Edge dislocation and screw dislocation.
2. (a) Discuss the BCS Theory of Superconductivity.
(b) Explain Quantum theory of Paramagnetism.
3. (a) Obtain Gibbs Thomson equation for vapour and solution.
(b) Explain the BCF theory of solution growth.

4. (a) Explain Bridgman Method of crystal pulling apparatus.
(b) Outline the ideas of Non-linear phenomena in KDP crystals.
5. (a) Describe the single diffusion and double diffusion method of growing crystals in gel medium.
(b) Give the principle and working of Chemical Vapour Transport (CVT) method of growing crystals.
6. (a) Derive the London equation.
(b) Explain the A.C. and D.C. Josephson effects.
7. (a) Explain Neutron diffraction technique in detail.
(b) Write a note on colour centers.
8. (a) Describe the growth of potassium titanyle Sulphate.
(b) Explain the stationary temperature profiles of vapour growth.

Reg. No. :

D 2106

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

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M.Sc. DEGREE EXAMINATION, MAY 2013.

Second Year

Physics

ELECTRODYNAMICS AND PLASMA PHYSICS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Derive the expression for power radiated in Bremstrahlung radiation.
(b) Derive the wave equation for vector and scalar potential.
2. (a) Discuss the motion of charged particles in uniform electric and magnetic particles.
(b) Explain the adiabatic invariants for first and second kind.

3. (a) Derive the fluid equation for plasma.
(b) Explain the two stream and gravitational instabilities.
4. (a) Discuss the validity of plasma approximation.
(b) Explain the Alfvén waves and their measurement.
5. (a) Outline the Kinetic theory for plasma.
(b) Discuss the plasma Oscillations and Landau damping.
6. (a) Derive the Lorentz transformation equation in four dimensional space.
(b) Explain the reaction force of Cerenkov radiation.
7. (a) Describe the experimental verification of BGK and Vankampen modes.
(b) Discuss the concept of β in plasma physics.
8. (a) Explain the electrostatic electron Oscillation perpendicular to B.
(b) Write a note on CMA diagrams.

Reg. No. :

D 2107

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

(For the candidates admitted from 2007 onwards)

M.Sc. DEGREE EXAMINATION, MAY 2013.

Second Year

Physics

COMPUTATIONAL METHODS AND
PROGRAMMING

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Using Newton-Raphson method, find correct to four decimal places v/w 0 & 1 equation $x^3 - 6x + 4 = 0$.

- (b) Solve by Gauss elimination method

$$2x + y + 4z = 12$$

$$8x - 3y + 2z = 20$$

$$4x + 11y = 33$$

8. (a) Solve the poisson's equation $\nabla^2 U = -10(x^2 + y^2 + 10)$. Over the squares mesh with sides $x=0$; $y=0$ $x=3$; $y=3$; with $U=0$ on boundary and mesh length = 1.

(b) Find the approximation value of $\int_0^{\pi} \sin x \, dx$.
