NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–I
(Mathematical Physics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1.   Find the solution of harmonic oscillator by Hamilton Jacobi Method.

2.   Obtain the expression for normal frequencies of a double pendulum.

3.   Find the eigen values and eigenvectors of the following matrix and show that nxn matrix may have n linearly independent eigenvectors, or it may have fewer that n.

$$A = \begin{vmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & -0 \end{vmatrix}$$

4.   Find the general solution of the following equation $y'' - 5y' + 6y = 2e^x + 6x - 5$.

5.   Prove that : $(1 - x^2)\, P_n'(x) = -\dfrac{n(n+1)}{2n+1}\left[P_{n+1}(x) - P_{n-1}(x)\right]$

6.   Find the value of $J \pm \frac{1}{2}\ (x)\ and\ J \pm \frac{3}{2}\ (x)$.

7.   Describe the following recurrence formulae for Hermite Polynomials :

   (a) $H_n''(x) = 4n(n-1)\, H_{n-2}(x)$

   (b) $2x\, H_n(x) - H_{n+1}(x) = H_n'(x)$

8.   Show that $(2n+1-x)\, L_n(x) = (n+1)\, L_{n+1}(x) - nL_{n-1}(x)$

9.   A covariant tensor has components xy, $2y-z^2$, xz in rectangular coordinates. Find its covariant components in spherical coordinates.

10.   If $A^k = g^{JK}\, Aj$; Show that $A_j = g_{jk} A^k$.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–II
(Quantum Mechanics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Derive Schrödinger (i) time independent and (ii) time dependent equations for matter waves. Give physical interpretation of the wave function. Define the stationary states of a particle.

2. State and prove Heisenberg uncertainty principle. What are its consequences.

3. Calculate the reflection and the transmission coefficients when a particle with energy $E > V_o$ is incident on a potential step defined by

    $V_{(x)} = 0$ *for $x < 0$*

    $\phantom{V_{(x)}} = V_0$ *for $x > 0$*

4. State the postulates of Schrödinger formulation of quantum mechanics.

5. Set up Schrödinger equation for an one dimensional harmonic oscillator and solve it for energy eigenvalues and eigenfunctions.

6. Show that, (i) $\left[L^2, L_\pm\right] = 0$, (ii) $\left[L_+, L_-\right] = 2\hbar L_z$, (iii) $\left[L_z, L_+\right] = \hbar L_z$ and $\left[L_z, L_-\right] = -2\hbar L_z$.

7. Using the method of partial waves for the study of scattering problems, show that scattering cross section is given by $\sigma = \dfrac{4\pi}{k^2} \sum\limits_{l=0}^{\infty} (2l + 1)\, Sin^2 \delta l$

8. Write down Schrödinger's equation for hydrogen atom and apply the separation of variables method to obtain the radial wave function for the system.

9. Give a brief account of quantum mechanical theory of Stark effect for splitting of energy of hydrogen atom.

10. Write short notes on any **Two** of the following :—
    (a) de-Broglie hypothesis
    (b) Operator form of K.E. & momentum.
    (c) Degeneracy.
    (d) Dirac δ-function.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–III
(Electrodynamics and Plasma Physics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Show that the scalar product $\vec{E} \cdot \vec{B}$ is unchanged under Lorentz transformation and show the same for $E^2 - C^2 B^2$.

2. What do you mean by Lienard and Weichert potential ? Obtain expression for Lienard-Weichart potential for uniformly moving point charge.

3. Obtain the electric and magnetic field due to acceleration parallel and perpendicular to the velocity of charged particle.

4. Discuss Larmor's formula for a non-relativistic accelerated charge.

5. Discuss the motion of a charged particle in an oscillating electromagnetic field.

6. Write Maxwell's equations in tensor form and show that they are covariant under transformations.

7. Give Saha theory of thermal ionisation and explain the determination of plasma ionisation on its basis.

8. Discuss Debye length, Debye shielding and the plasma parameter in detail.

9. Derive Boltzmann's equation. What is Boltzmann-Vlasov equation.

10. Discuss in details :—
    (a) Pulsed plasma Nitriding
    (b) Plasma enhanced chemical vapour deposition
    (c) Plasma pyrolysis of medical waste
    (d) Space plasma

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–IV
(Statistical Mechanics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. State and prove Liouville theorem. How is it analogous to the equation of continuity of an incompressible fluid ?

2. Explain partition function. Deduce expression for partition function of a monoatomic gas.

3. Explain : ensembles, microcanonical and the grand canonical ensembles. Derive Sackur equation for a perfect gas.

4. What do you mean by cluster expansion ? Discuss the theory of cluster expansion.

5. Explain the first and the second order phase transitions. Give the Landau theory of transition.

6. Prove that the one dimensional Ising model does not explain the spontaneous magnetization. How does the solution of the two dimensional Ising model overcome these difficulties ?

7. What are critical indices ? explain the different kinds of critical indices.

8. Derive Fermi-Dirac distribution law.

9. Derive the virial equation of state and evaluate the virial coefficients.

10. What is entropy ? Show that, (a) $S = K \ln z + \dfrac{U}{T}$,   (b) $U = -\dfrac{\partial}{\partial \beta}(\ln z)$, Where notations have their usual meaning.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–V
(Nuclear and Particle Physics)
Annual Examination, 2018

1. What is β-decay ? Give Fermi theory of β-decay. Discuss Fermi and Gamow-Teller selection rules in the context of Fermi's theory of β-disintegration.

2. Discuss the nature and properties of π-mesons. How does it account for the charge independence of nuclear forces ? Show that the parity of π-mesons is negative.

3. Discuss the quark model in detail. How does this model explain baryons and mesons ?

4. What are electric and magnetic transitions in Gamma-ray emission ? Explain multipolarity in the Gamma transition.

5. What is majorana force ? Explain why a neutron-proton pair forms bound nucleus, while a bi-neutron and a di-proton pair does not. How this exchange force gives rise to saturation in binding energy ?

6. Write the classification chart of elementary particles. Give in details the electromagnetic interaction between elementary particles.

7. Describe the compound nucleus theory of nuclear reactions. Give experimental evidences in support of this theory.

8. Define the Q-value of a nuclear reaction. Establish the Q-equation of the nuclear reaction.

9. What are stripping and pickup reactions ? Obtain an expression for reaction amplitude using Born approximation for the above reactions.

10. Explain nuclear quadrupole moment and discuss the ground state of deuteron in the light of the fact that it has small but definite quadrupole moment.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–VI
(Atomic and molecular Physics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer Five Questions in all, selecting at least Two Questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Discuss the hyperfine structure of Spectral lines. What light does this Throw on the spin and magnetic moment of atomic nuclei ?

2. Describe the general feature of the spectra of alkali-like atoms. How are they explained.

3. Deduce an expression for the series spectra of a hydrogen-like atom, taking into account the finite mass of the nucleus. Calculate the energy required to remove the electron from singly-ionized helium atom.

4. What are normal and anomalous Zeeman effects ? How are they explained ?

5. Discuss stark effect. Show that splitting increases with the increase of principal quantum number n.

GROUP 'B'

6. Describe the principal features of the rotational band spectrum of a diatomic molecule.

7. Give the theory of a vibrational-rotational spectrum of a diatomic molecules.

8. Discuss the Raman spectra of a diatomic molecule and point out the similarities and diffrences with infra-red Raman spectra.

9. Explain the important features of electronic spectra. How electronic spectra differ from atomic spectra.

10. Explain with calculation of frequency for ESR and VMR.

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For Practical Counselling Class & Practical Examination Programme
Please See on Back Page.

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–VII
(Condensed Matter Physics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What are Miller indices ? How the orientation of a plane is specified by Miller indices ? Explain their importance. Write down the Miller indices for planes with intercepts $(a,\ 2b,\ \alpha)$.

2. Derive the Laue equations for diffraction of X-rays by a crystalline solid. Show that the Bragg's equation in a special case of the Laue equations.

3. How are Brillouin Zones constructed ? Describe and sketch the first Brillouin Zones of bcc and fcc lattices. Mention their importance in crystal analysis.

4. What is atomic scattering factor ? Derive the general expression for the atomic scattering factor using spherical polar coordinates.

5. Discuss Kronig-Penny model for a linear lattice. How does it lead to the formation of bands in solids.

6. (a) State and prove Bloch theorem.
   (b) Explain the significance of the effective mass of the electron.

7. Explain the Schottky and the Frenkel defects. Calculate the equilibrium concentration defects and indicate the order of their magnitude.

8. Describe the tight binding approximation for calculating the energy states of an electron in a solid. How can this method be compared with the nearby free electron model in the case of a metal.

9. Discuss the quantization of electron orbits in magnetic field.

10. Explain the difference between Type I and Type II superconductors. Prove that Meissner effect and the disappearance of resistinity in a superconductor are mutually consistant.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-I
PAPER–VIII
(Electronic Devices)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1.   What is Gunn effect ? Describe the design of Gunn diode and discuss its operating characterics.

2.   Describe the design and operating characteristic of UJT. How are they explained ?

3.   What is meant by pinch off ? How does it take place in JEFT.

4.   What do you understand by electrogyration ? Explain it on the basis of symmetry approach.

5.   Explain the basic design and working of change coupled device (CCD)

6.   Explain large Bragg angle diffraction with special reference to codirectional and contradirectional.

7.   What is Raman-Nath diffraction. How can it be observed. Give they theory of this diffraction.

8.   Give an account of the theoretical treatment of liquid crystals.

9.   What is meant by magneto optic effect ? Explain it with special reference to Faraday effect and magneto optic K_{err}.

10. Explain piezoelectricity and discuss the application of piezoelectric metarial in sensors and actuation.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–IX
(Computational Mathematics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Using Lin-Bairstow's method obtain quadratic factor of the polynomial given by
   $f(x) = x^3 - 2x^2 + 5x - 2$

2. Solve the following systems by Gauss-Seidel method,
   $10x + 2y + z = 9$
   $2x + 20y + z = -44$
   $-2x + 3y + 10z = 22$

3. State and prove Stirling's formula for interpolation.

4. From the Taylor's series for $y(x)$, find $y(0, 1)$, correct to three decimal places if $y(x)$ satisfies $y' = x - y^2$ and $y(0) = 1$.

5. What is Euler-Maclaurin formula for numerical integration ? Evaluate $I = \int_0^{\pi/2} Cosx \, dx$ using this formula.

6. Give the theory of Crank-Nicolson Method to solve the parabolic partial differential equation. Explain it with a suitable solved example.

7. Solve the equation $y'' + y + 1 = 0$, with boundary conditions y = 0, when x = 0 and y = 0 when x = 1.

8. Using finite difference method, solve the following differential equation $\dfrac{d^2y}{dx^2} = y$ with $y(0) = 0$, $y(2) = 3.627$.

9. Use Splin method to solve the initial value problem $y'' + 2y' + y + 0$, $y(0) = 0$, $y(1) = 0$.

10. From the following table of values of x and y, obtain $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$ for $x = 1.2$.

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–X
(Programming with Fortran and C++)
Annual Examination, 2018

Time : 3 Hours.   Full Marks : 80

Answer any Five Questions.
All questions carry equal marks.

1. What are executable and non-executable statements and what is difference between them ?

2. Discuss the following three ways of writing $X2$ in Fortran; (a) X^*X, (b) $X^{**}2$, (c) $X^{**}2.0$.

3. Write Fortran program which counts the number of positive numbers and the number of negative numbers.

4. Write a SUBROUTINE subprogram which does not have any (a) argument (b) RETURN statement.

5. Write a program segment or subroutine to plot a graph between specified limit with its argument range of 101.

6. Discuss the characteristics of OPEN, READ END FILE and close FILE used in file format of Fortran.

7. Write a function in C++ to generate a Fibonacci series of n numbers, where n is defined by a program.

8. Write a program in C++ to perform the following, (a) Area of a triangle (b) Area of a rectangle.

9. What is a function ? List out the advantages and disadvantages of using functions in C++.

10. What is a relationship between a pointer and an array ? How is a pointer variable declared in C++.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
Venue : School of Computer Education & IT, Nalanda Open University, 12th Floor, Biscomaun Tower, Patna-800001				

For Enrollment No. All Old Batch Students

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
09.07.2018 to 10.07.2018	11.00 AM to 5.00 PM	XII	11.07.2018	11:30 AM to 2:30 PM
		XIV	11.07.2018	2:45 PM to 5:45 PM
		XV	12.07.2018	11:30 AM to 2:30 PM
		XVI	12.07.2018	2:45 PM to 5:45 PM
Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

For Enrollment No. 160280001 to 160280660

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
13.07.2018 to 14.07.2018	11.00 AM to 5.00 PM	XII	16.07.2018	11:30 AM to 2:30 PM
		XIV	16.07.2018	2:45 PM to 5:45 PM
		XV	17.07.2018	11:30 AM to 2:30 PM
		XVI	17.07.2018	2:45 PM to 5:45 PM
Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–XI
(Physics of Nano Materials)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1.   What are Nanoparticles ? What are quantum dots ? Give short notes on their applications.

2.   Discuss the motion of electrons in two dimensional potential well and obtain expression for density of states.

3.   What is a quantum wire ? Discuss the optical properties of quantum wire. Describe various quantum wire devices.

4.   Write note on, (i) Quantum Well (ii) Superlattice.

5.   Enumerate the basic steps involved in construction of electron microscope. Give brief notes on Transmission Electron microscope (TEM) Scanning Electron Microscope (SEM)

6.   What is difference between 'Bottom up' and 'bottom down' methods of producing nanoparticles ? Describe, in detail, the Sol-Gel method' of preparation of nanoparticles.

7.   What is multiferroic material ? Describe the application of such materials.

8.   What is Raman effect ? Discuss variations in Raman spectra of nanoparticles.

9.   Explain the phenomenon of photoluminescence, phosphorescence and chemiluminescence. How do you account for the shift in the peaks of PL-Spectra ?

10. Write notes on :-
     (a)   Plasma Arcing
     (b)   Hund's rule in quantum dot

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
Date	*Time*	*Paper*	*Date*	*Time*
02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
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For Enrollment No. 160280001 to 160280660

Counselling Class Programme		Practical Examination Programme		
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13.07.2018 to 14.07.2018	11.00 AM to 5.00 PM	XII	16.07.2018	11:30 AM to 2:30 PM
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Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–XII
(Science and Technology of Renewable Energy)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Derive expression for Radiant Power Density.

2. Explain 'quantum efficiency' and 'spectral response'. How will you calculate quantum efficiency from spectral response.

3. What do you understand by first, second and third generation of solar cells ? What efficiency they can achieve ?

4. Explain series and shunt resistances and their effects on 'Fill Factor' (FF) in solar cells. Distinguish between characteristics and parasitic resistances.

5. Derive Betz's law and show that maximum efficiency of rotors can't exceed 60%. What are the factors that limit the use of wind energy ?

6. What are environmental impacts of harnessing the geothermal, the wave and the tidal energy ? What are the methods employed in harnessing the tidal energy ?

7. Compare hydroelectric generation with other sources of energy and discuss its positive and negative aspects. What are its limitations ?

8. What are advantages and disadvantages of hydrogen energy applications ?

9. Can solar energy be used for cooling ? How ?

10. Write notes on the following :-
    (a) Wave energy generation.
    (b) Ideal solar cell.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
Venue : School of Computer Education & IT, Nalanda Open University, 12th Floor, Biscomaun Tower, Patna-800001				

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For Enrollment No. 160280001 to 160280660

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Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER—XIII
(Environmental Physics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What is atmospheric stratification ? Explain its importance. What do you mean by 'The Froude Number' ?

2. What is LIDAR ? Explain its principle, physical and technical aspects with applications.

3. Explain Einstein's A and B coefficients of absorption, stimulated emission and spontaneous emission. Hence deduce Lambert-Beer's Law.

4. Discuss equation of motion for fluid and hence obtain the Navier-Stoke's equation for fluids.

5. What do you mean by 'End-of-Year Cost' and 'Rest Value' ? What is 'building times' and 'break-even points' with reference to conventional energy sources.

6. Enumerate the basis atmospheric forces to study laws of motion in atmosphere. Explain what do you mean by 'Baroclinic Model' and 'Renold's Number' (Re).

7. Derive Fick law and explain its analogy with heat transfer equation.

8. Why Bifuels are called renewable energy source ? Explain briefly, the four generations of Bifuesl.

9. Discuss improvements in diffusion equations to predict the transport of pollutants to a fair accuracy. What is Drupuit Approximation ? Discuss.

10. Explain the principle of solar collectors which absorb solar radiation. Find the expression for the net heat flux entering the collector.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
Date	*Time*	*Paper*	*Date*	*Time*
02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
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Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER—XIV
(Photonics)
Annual Examination, 2018

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What do you mean by 'Core and Cladding' ? Describe the structures of different types of optical fibers with ray path.

2. Describe with a neat diagram the operation of Ruby laser. Explain the origin of spiking in laser emission.

3. What do you mean by 'stimulated emission' and 'population inversion' ? How is the population inversion accomplished in semiconductor and non-semiconductor laser ?

4. How plasma screen in different from LCD screen ? What is the future of LCD screen ?

5. Explain the difference between analog and digital communication. Why digital communication is more suitable with modern day requirements ?

6. What is optical fiber flow sensor ? Describe optical fiber gyroscope.

7. Describe intrinsic semiconductor laser and doped semiconductor laser. What is limitation for these lasers to operate continuously.

8. Obtain a relation between divergence and Waist Rise of of the beam for a Gaussian distribution of wave energy.

9. What is LED ? Describe its design and explain its working.

10. Write notes on the following :–
    (a) Ultrafast laser and its uses
    (b) Holography
    (c) Optical transmitters and receivers

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
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02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
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		XVI	17.07.2018	2:45 PM to 5:45 PM
Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–XV
(Advanced Condensed Matter Physics)
Annual Examination, 2018

Time : 3 Hours.   Full Marks : 80

Answer any Five Questions.
All questions carry equal marks.

1. What is Mösbauer effect ? Explain Doppler broadening through intensity-frequency graphs for gamma emission and absorption by identical nuclei.

2. Derive Clausius-Mossotti formula relating the dielectric constant and the polarisability for a composite dielectric material.

3. What is skin effect ? Distinguish between normal and anamalous skin effect. Give the mathematical theory of anomalous skin effect. How do you get information about Fermi structure with the help of this effect ?

4. State Gruneisen law. Derive equation of state and gruneisen parameter for solids.

5. What is Debye-Waller factor ? What is its origin ? Discuss the temperature dependence of the Bragg reflection.

6. Give a quantitative treatment of BCS ground state. Obtain an expression for the energy gap at 0K.

7. What is polariton ? Obtain polariton dispersion relation. How does it stand the experiment test ?

8. Derive an expression for electrical conductivity of metal on Drone Model. Explain the effect on conductivity if an alternatives electric field is applied to the system.

9. What do you understand by direct transition and indirect transition ? Calculate the absorption coefficient in case of direct transition.

10. What are ionic crystals ? Explain the formation of an ionic crystal and obtain, in short, an expression for its cohesive energy.

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NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
Practical Counseling and Practical Examination Programme, 2018
Practical Programme for Paper-X of All Students

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
02.07.2018 to 06.07.2018	1.00 PM to 5.00 PM	X	07.07.2018	12:00 Noon to 3:00 PM
Venue : School of Computer Education & IT, Nalanda Open University, 12th Floor, Biscomaun Tower, Patna-800001				

For Enrollment No. All Old Batch Students

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
09.07.2018 to 10.07.2018	11.00 AM to 5.00 PM	XII	11.07.2018	11:30 AM to 2:30 PM
		XIV	11.07.2018	2:45 PM to 5:45 PM
		XV	12.07.2018	11:30 AM to 2:30 PM
		XVI	12.07.2018	2:45 PM to 5:45 PM
Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

For Enrollment No. 160280001 to 160280660

Counselling Class Programme		Practical Examination Programme		
Date	Time	Paper	Date	Time
13.07.2018 to 14.07.2018	11.00 AM to 5.00 PM	XII	16.07.2018	11:30 AM to 2:30 PM
		XIV	16.07.2018	2:45 PM to 5:45 PM
		XV	17.07.2018	11:30 AM to 2:30 PM
		XVI	17.07.2018	2:45 PM to 5:45 PM
Venue : Physics Lab, 1st Floor Biscomaun Tower, Patna-800001				

NALANDA OPEN UNIVERSITY
M.Sc. Physics, Part-II
PAPER–XVI
(Advanced Electronics)
Annual Examination, 2018

Time : 3 Hours.   **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What is a level transistor circuit ? Why it is used with the cascaded differential amplifier ?

2. What is a multiplexer ? Draw the logic circuit for a 4-to-1 multiplexer. Write the Boolean equation and describe the truth table.

3. What is an op-amp ? What are the characteristics of an ideal op-amp ? Draw the block diagram of an op-amp ?

4. What is a decoder ? Describe seven segment displays for an LED circuit.

5. What is encoder. Draw the logic circuit of 8-time-to-3 time encoder.

6. What is Read Only Memory (ROM) ? Distinguish between PROM and EPROM. Give some of the important applications of ROM.

7. What is a comparator ? Explain the working of a comparator. What are its important characteristics ?

8. What are the five basic hardware blocks of a digital computer ? Draw the block diagram of a digital computer and explain the working of each block.

9. What is a flip-flop ? Explain the functioning of NOR and NAND latch.

10. Explain the architecture of 8086 microprocessor.

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