

(Pages : 4)

L – 1895

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Group 2(a) – Physics and Computer Applications

Core Course

PC 1672 : OPERATING SYSTEM

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Very Short Answer Type)

(One word to maximum of one sentences, Answer all questions.)

1. Define Operating System.
2. What is a PCB?
3. What is a Semaphore?
4. Which algorithm is used for the Process Synchronization of N processes?
5. What are Cooperating Processes?
6. Define Short Term Scheduler.
7. What is Dirty Bit?

P.T.O.

8. What is Locality of Reference?
9. What is meant by file Organisation?
10. Expand RAID.

(10 × 1 = 10 Marks)

SECTION – B

(Short Answer Type)

(Not to exceed one paragraph, answer any eight questions, Each carry 2 marks)

11. Explain the tasks involved in the Memory Management function of an Operating System.
12. What is meant by Process Spawning?
13. What is Context Switching?
14. Differentiate between Process and Threads.
15. What is Critical Section? What is its importance?
16. Define Wait and Signal Operations of a Semaphore.
17. State Dining Philosophers Problem.
18. What are the necessary conditions of a deadlock?
19. Differentiate Logical and Physical Address.
20. Differentiate External and Internal Fragmentation.
21. What is demand paging?
22. Differentiate Execution Time Binding and Load Time Binding:
23. What are overlays? What is its advantages?

24. What are TLBs?
25. Explain the technique of DMA transfer in IO management?
26. Explain fork() in system Call.

(8 × 2 = 16 Marks)

SECTION – C

(Short Essay Questions)

(Not to exceed **120** words, answer **any six** questions, Each question carry **4** marks)

27. Explain Process states with diagram.
28. Explain the technique of Multi Level Queue Scheduling.
29. Describe Peterson Solution for Critical Section.
30. Explain the terms: Turnaround Time, Response Time, Burst Time, Waiting Time.
31. Describe the various levels of Scheduling.
32. What are the causes of Thrashing?
33. Explain the File operations.
34. Explain the continuous File allocation Technique.
35. Differentiate Polling and Interrupts .
36. What are the advantages of DMA transfer?
37. What all services are supervised by I/O Subsystem?
38. Explain SCAN algorithm used for Disk Scheduling.

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay Questions)

(Answer any two questions, Each question carry 15 marks)

39. What are the different types of Operating system?
40. Explain in detail Preemptive Scheduling Algorithms.
41. Explain with appropriate example, Banker's Algorithm.
42. Describe the various Non-Continuous Memory allocation techniques.
43. What are the various free space management techniques available in an Operating system?
44. Explain the various Protection and Security measures needed in an operating system.

(2 × 15 = 30 Marks)

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L – 1896

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Physics with Computer Applications

Elective Course

PC 1661.1 – ASTRONOMY AND ASTROPHYSICS

(2015 – 2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer all questions in one or two sentences. Each question carries 1 mark.

1. Define 1 Parsec.
2. Explain prograde and reterograde.
3. What are Pyroxene minerals?
4. What is side real period?
5. What is Pogson ratio?
6. Define Redshift.
7. What is Mean Solar day?
8. Define Eccentricity.
9. How Spherical aberration can be corrected.
10. What do you meant by Period of a planet?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. **Each** question carries **2** marks.

11. Explain Titius Bode law.
12. Give an account on Galilean telescope.
13. How Ptolemy explains Celestial motion?
14. 'Orbits of planets and satellites are not circular' Justify.
15. Differentiate between Brightness and Luminosity.
16. Explain Doppler Effect of light.
17. Give an account on different types of Meteorites.
18. Define Perihelion and Aphelion.
19. What is Lunar month?
20. Which are the solid matters present in interstellar space?
21. Sketch the period luminosity relationship for Cepheids and RR Lyrae stars.
22. What is Supernova Explosion?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

23. What is a Neutron star? Estimate the radius of a neutron star if its mass is 10^{30} Kg.
24. Briefly explain Celestial coordinate system.
25. State Kepler's laws of planetary motion.

26. Explain different stages of a star which finally leads to neutron star.
27. With suitable diagram, explain the working of Reflecting telescope.
28. What is Hubble's constant? Establish the relation between Hubble's constant, Hubble's time and Hubble's distance
29. Briefly explain the formation of Planets.
30. Write a short note on microwave background radiation.
31. Discuss on Proton — Proton cycle.

(6 × 4 = 24 Marks)

SECTION – D

Answer any two questions. Each question carries 15 marks.

32. (a) Differentiate between apparent and absolute magnitudes and establish the relationship between them.
- (b) If the distance of a star is 100PC and its apparent magnitude is 6, what is its absolute magnitude?
- (c) Describe Parallax method to determine the distances of stellar objects.
33. With the help of HR diagram briefly explain the evolution of stars.
34. Discuss on Comets, Asteroids and Meteorites.
35. (a) Briefly explain different layers of sun.
- (b) Explain solar features.

(2 × 15 = 30 Marks)

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L – 2037

Reg. No. :

Name :

Sixth Semester B.C.A. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Group 2 (b) - Computer Applications

Elective Course

CP 1661.3 : SOFTWARE TESTING

(2015 - 2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer **ALL** questions. Each question carries 1 mark.)

1. Define bug.
2. Write a note on component testing.
3. Define feature bugs.
4. Define conjugation in terms of transaction flow graph.
5. What is walk through?
6. What is path sensitization?
7. Expand MIMD.
8. What is a killed or undefined object?

P.T.O.

9. Define static analysis.
10. Define loop free path segment.

(10 × 1 = 10 Marks)

SECTION – B

(Answer any **eight** questions. Each question carries **2** mark)

11. Write in brief about test design.
12. What do you mean by Functional Testing?
13. What is the difference between builder and buyer?
14. Write in brief about unforgiving data flow graph.
15. Explain about recoverable anomalies and alternate state graphs.
16. What is du path? Explain in brief.
17. Differentiate contradictory domain and ambiguous domain.
18. Write in detail about mean processing time of a routine.
19. Explain about loop removal operations in reduction procedure.
20. What is decision table? Explain.
21. Define and explain inference engine.
22. Write a note on finite state machine.

(8 × 2 = 16 Marks)

SECTION – C

(Answer any **six** questions. **Each** question carries **4** marks.)

23. What is the purpose of Testing?
24. Explain about Program model for testing.
25. Explain about consequences of bugs.
26. Write a note on complete boundaries.
27. What do you mean by closure compatibility? Explain.
28. Write a note on Path sums.
29. Discuss about maximum path count arithmetic.
30. Explain about two variable kv chart.
31. Write in detail about unreachable states.

(6 × 4 = 24 Marks)

SECTION – D

(Answer any **two** questions. **Each** question carries **15** marks.)

32. What is the Difference between Testing and Debugging? Explain in detail.
33. Explain about Data Flow Testing.
34. Write in detail about Path Expressions in detail.
35. Describe Transition Testing in detail.

(2 × 15 = 30 Marks)

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L – 1885

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Physics with Computer Applications

Core Course

PC 1641 : SOLID STATE PHYSICS

(2015 – 2017 Admission)

Time : 3 Hours

sMax. Marks : 80

SECTION – A

Answer **all** questions; **each** carries **1** mark.

1. Define crystal.
2. What are lattice points?
3. What is a unit cell?
4. What is meant by bonding in crystal?
5. What is free electron gas model?
6. Define electrical resistivity.
7. Define phonon.
8. What is electric susceptibility?

P.T.O.

9. Define electric polarization.
10. Define critical magnetic field.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight**; each carries **2** marks.

11. Differentiate between crystalline and amorphous solids.
12. Explain translation symmetry.
13. Write the properties of ionic bonds.
14. Explain the formation of hydrogen bonding.
15. Explain Hall effect.
16. Write the merits of free electron theory.
17. Write the assumptions of Einstein model.
18. Explain Debye's T^3 law.
19. Explain antiferro magnetism.
20. Explain the origin of ferromagnetism Give examples of ferromagnetic materials.
21. Explain Meissner effect.
22. Explain zero resistance.

(8 × 2 = 16 Marks)

SECTION – C

Answer any six; each carries 4 marks.

23. The lattice constant of a cubic crystal is 6.23 Å. What is the interplanar spacing between the (1 1 1) planes?
24. A substance with face centred cubic lattice has density 5260 kg/m³ and molecular weight 60.2. Calculate the lattice constant Given : Avogadro number = 6.02×10^{26} kg/mol.
25. Calculate the glancing angle on the (1 0 0) plane of a crystal with spacing 4.51 Å corresponding to the first order diffraction maximum for X-rays of wavelength 1.54 Å.
26. Fermi energy of conduction electrons in silver is 5.4 eV. Calculate the number of electrons per m³. (Given : $m_e = 9.11 \times 10^{-31}$ kg; Plank's constant $h = 6.6260715 \times 10^{-34}$ Js; 1 eV = 1.6×10^{-19} J)
27. The Debye cut off frequency of Be whose Debye temperature is 1440 K. Given $h = 6.625 \times 10^{-34}$ Js and $k = 1.38 \times 10^{-23}$ J/K.
28. Distinguish between dia, para and ferromagnetic materials.
29. A paramagnetic substance has 10^{28} atoms/m³. The magnetic moment of each atom is 2×10^{-23} Am². Determine the paramagnetic susceptibility at 300 K. [Given : permeability of free space $\mu_0 = 4\pi \times 10^{-7}$ H/m; Boltzmann constant $k_B = 1.38 \times 10^{-23}$ J/K]
30. Explain the various properties of superconductors.
31. Superconducting tin has a critical temperature of 3.7 K at zero magnetic field and a critical field of 0.0306 tesla at 0 K. Find the critical field at 2 K.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two**; each carries **15** marks.

32. Explain the following structures with their diagram:
- (a) Diamond
 - (b) NaCl
 - (c) CsCl
33. Using Einstein model, derive the expression for the specific heat of a solid. Discuss its merits and demerits.
34. Derive an expression for diamagnetic susceptibility using Langevin's theory.
35. Discuss the effect of magnetic field in superconductors. Distinguish between type I and type II superconductors.

(2 × 15 = 30 Marks)

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L – 1890

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Physics with Computer Applications

Core Course

PC 1642 – STATISTICAL MECHANICS AND QUANTUM MECHANICS

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer all questions in one or two sentences. Each question carries 1 mark).

1. What are microstates?
2. Name the law corresponding to the low frequency part of black body spectrum.
3. Mention any two particles obeying Bose-Einstein statistics.
4. What is meant by phase space?
5. What is de-Brogile hypothesis?
6. Write down the general eigen value equation.
7. What is normalization condition?
8. Write down Einstein's photoelectric equation.

P.T.O.

9. What is a square well potential?
10. Give the expression for Compton shift.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions not exceeding a paragraph. Each question carries 2 marks.

11. Define probability. Explain the principle of equal probability.
12. Explain what is meant by Bose Einstein condensate.
13. Discuss the properties of three statistical distributions.
14. Give a short account of microcanonical ensemble.
15. What is meant by canonical ensemble?
16. Explain Wein's displacement law. Why it is called so?
17. Explain the term "indistinguishability".
18. Explain Fermi- Dirac distribution function.
19. Give a short note on wave packet.
20. Explain the conclusions of photoelectric effect.
21. Consider the standing wave of an electron in an orbit and obtain Bohr's quantization rule.
22. Outline the probability interpretation of the wave function.
23. Give any four characteristic features of Schrodinger equation.
24. What is zero-point energy of a harmonic oscillator?

25. Write down the free particle Schrodinger equation. How k is related to E in the equation?
26. Sketch out the black radiation curve and mark out the different regions.

(8 × 2 = 16 Marks)

SECTION – C

(Answer any six questions. Each question carries 4 marks).

27. Find the root mean square velocity of H_2 gas at room temperature.
28. Four particles are to be arranged in 5 different energy levels. Calculate the possible number of ways of distribution of the particles if they are bosons.
29. Show that the minimum volume element in phase space is h^3 .
30. Find the rms speed of oxygen molecules at $0^\circ C$.
31. Evaluate the average energy of a molecule at room temperature.
32. X-rays with $\lambda = 1.0 \text{ \AA}$ are scattered from a metal block. The scattered radiations are viewed at 90° to the incident radiation. Evaluate the Compton shift.
33. What is the work function of a metal, if the threshold wavelength for it is 580 nm.
34. Derive Wein's displacement law from Planck's radiation formula.
35. Determine the de-Broglie wavelength of an electron that has been accelerated through a potential difference of 100 V.
36. Normalize the wave function $\psi(x) = A \exp(-\alpha x^2)$ where A and α are constants and the domain $-\alpha \leq x \leq \alpha$.
37. Calculate the maximum wavelength that hydrogen atom in its ground state can absorb.
38. Sketch out the wave function and probability density for $n = 0$ and $n = 1$ states of a linear harmonic oscillator.

(6 × 4 = 24 Marks)

SECTION – D

(Answer any two questions. Each question carries 15 marks).

39. Derive the Bose-Einstein distribution law.
40. Deduce Maxwell velocity distribution for an ideal gas.
41. Describe with necessary theory any one application of Fermi-Dirac distribution law.
42. Explain the generalized statistical interpretation of wave function. Prove the generalized uncertainty principle.
43. Solve the Schrodinger equation for a harmonic oscillator.
44. Discuss Bohr atom model. Derive an expression for hydrogen spectrum.

(2 × 15 = 30 Marks)

(Pages : 4)

L – 1891

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Physics with Computer Applications

Elective Course

PC 1661.1 – ASTRONOMY AND ASTROPHYSICS

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer all questions; each carries 1 mark)

1. What are monopoles?
2. What is the binding energy of ^2H ?
3. What is photosphere?
4. What is a star?
5. What is glass?
6. What is Oort cloud?
7. Define a year.
8. Define sidereal year.

P.T.O.

9. What is astronomy?
10. What is milky way?

(10 × 1 = 10 Marks)

SECTION – B

(Answer any eight; each carries 2 marks)

11. What we called the visible universe?
12. Explain Titus-Bode law.
13. Explain Planckian.
14. Differentiate between horizontal parallax and heliocentric parallax.
15. What is Chandrasekhar limit?
16. What is singularity?
17. What is prograde and retrograde?
18. What is sidereal period?
19. What is called spherical aberration?
20. What is called nebulae?
21. 'The solar day is longer than the sidereal day'. Why?
22. What is atomic second?
23. What is supernova?
24. What are asteroids?
25. What is neutron star?
26. What is renaissance astronomy?

(8 × 2 = 16 Marks)

SECTION – C

(Answer any **six**; each carries **4** marks)

27. Explain the importance of X interaction in inflation model.
28. Calculate the mass of top and bottom quarks in joule.
29. Explain the formation of galactic clusters.
30. Explain the Schwarzschild radius.
31. Explain Stefan-Boltzmann law.
32. Explain gravity waves.
33. Explain elliptical galaxies.
34. What is the relation of astronomy to some other branches of science?
35. What are the methods of astronomy?
36. Write a note on modern astronomy.
37. Explain harmonic motion.
38. Describe black holes.

(6 × 4 = 24 Marks)

SECTION – D

(Answer any **two**; each carries **15** marks)

39. Explain the inflation model over standard model.
40. Explain the features of neutrons stars and black holes.

41. Give the detailed explanation on Galaxies.
42. Discuss about the seasons.
43. Explain the formation of planets.
44. What are the developments in scientific methods in astronomy and astrophysics?

(2 × 15 = 30 Marks)

(Pages : 3)

L – 1894

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Group 2 (a) – Computer Applications

Vocational Course XII

PC 1672 – COMPUTER NETWORKS

(2015-2017 Admission)

Time : 3 Hours

Max. Marks : 80

PART – A

(Very short answer type)

One word to maximum of one sentences, each question carries 1 mark.

1. Define a port.
2. An agreement between the communicating parties on how communication is to proceed is commonly referred to as _____?
3. OSI stands for _____.
4. The _____ protocol has flow control but no error control.
5. The hierarchical routing uses the idea of dividing routs called _____.
6. The data link layer uses a _____ to detect an error.
7. Expand POP.

P.T.O.

8. TCP is a _____ protocol
9. Define piggy backing.
10. What is baud rate?

(10 × 1 = 10 Marks)

PART – B

(Short Answer Type)

Answer any eight questions. Each question carries 2 marks.

11. What is difference between physical addressing and logical addressing?
12. What you mean by datagram?
13. Compare TCP vs UDP.
14. What is the principle behind optical fiber?
15. What are the basic elements of communication?
16. Define a protocol.
17. Explain the different modes of communication.
18. Write a note on ALOHA.
19. What is flow control?
20. What is meant by routing?
21. List out the file transfer protocols.
22. Explain hamming code in detail.

(8 × 2 = 16 Marks)

PART – C
(Short Essays)

Answer any **six** questions. **Each** question carries **4** marks.

23. Explain functions of data link layer.
24. State and explain the *Unrestricted Simplex Protocol*.
25. Explain framing in detail.
26. Explain congestion control.
27. Compare adaptive and non-adaptive routing.
28. Differentiate between leaky bucket algorithm and token bucket algorithm.
29. Compare flow based and hierarchical routing.
30. Explain the DNS service.
31. Describe different topology.

(6 × 4 = 24 Marks)

PART – D
(Long Essay)

Answer any **two** questions. **Each** question carries **15** marks.

32. Compare between OSI reference model and TCP/IP protocol suite.
33. Explain the different transmission media used for data communication.
34. Explain various routing algorithm in detail.
35. Write a note on various interfacing device and its functions.

(2 × 15 = 30 Marks)

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L – 1886

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Physics with Computer Applications

Core Course

PC 1641 : SOLID STATE PHYSICS

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer all questions. Each question carries 1 marks.

1. "All primitive cells are unit cells but all unit cells may not be primitive cells". Why?
2. Define "basis" of a crystal structure.
3. Define electron mobility.
4. Write down the equation for the Hall coefficient for n-type and p-type semiconductors.
5. What is a phonon?
6. State Bloch theorem.
7. Explain polarizability of a dielectric.
8. Write down Curie-Weiss Law.

P.T.O.

9. Mention any two applications of super conductivity.
10. What are Type II Superconductors?

(10 × 1 = 10 Marks)

PART – B

Answer any **eight** questions. Each question carries **2** marks.

11. What are the basic lattice parameters?
12. List out the rules to find the Miller indices of a lattice plane.
13. What is a reciprocal lattice?
14. Mention any two advantages of Neutron diffraction over its X-ray counterpart.
15. What is a free electron gas?
16. What is the significance of Fermi-Dirac distribution?
17. What are the parameters on which the Hall field depend on?
18. Mention the experimental evidence for the existence of phonons.
19. What is meant by the specific heat of a solid?
20. Write down the expression for specific heat of solids by Einstein.
21. What is meant by polarization in the context of dielectrics?
22. What is meant by the term 'local field' in the context of a solid dielectric?
23. List out how magnetic materials are classified.
24. What is critical temperature (or transition temperature)?
25. Discuss the effect of magnetic field on superconductivity.
26. What is Josephson junction?

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. Each question carries **4** marks.

27. Copper has FCC structure and the atomic radius is 0.1278 nm. Calculate the density and the inter-planar spacing for (321) planes. Atomic weight of Copper = 63.5, Avogadro's number = 6.02×10^{23} particles per mole.
28. Calculate the atomic radii of BCC and FCC lattices.
29. Calculate the inter-planar spacing d of planes (111) in a simple cubic lattice of side a .
30. Show that the average kinetic energy of free electrons following Fermi-Dirac statistics is $\frac{3}{5}E_F$ at $T = 0K$.
31. Calculate the Hall coefficient of Sodium on a free electron model. Given that Sodium has BCC structure having side equal to 0.428 nm.
32. Assuming the average energy of electrons to be three-fifths of the Fermi energy, estimate the pressure of the electron gas in a metal.
33. Discuss the nature of the vibrational energy of a crystal at temperatures below the Debye temperature.
34. Argon gas contains 2.7×10^{25} atoms at $0^\circ C$ and 1 atm. If the diameter of an Argon atom is 0.384 nm, find the dielectric constant of Argon at $0^\circ C$.
35. Find the relation between relative permittivity and susceptibility of a dielectric.
36. Magnetization and flux density of a magnetic material is 3200 A/m and 0.005 Wb/m^2 respectively Calculate the relative permeability of the material.
37. A superconducting Tin has a critical temperature of 3.7 K at zero magnetic field and a critical field of 0.0306 T at 0 K. What is the critical field at 2 K?
38. Derive the equation for London penetration depth.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** questions. Each question carries **15** marks.

39. Explain Hexagonal Close Packing (HCP). Derive its (c/a) ratio and calculate packing fraction.
40. (a) Explain Electron diffraction.
(b) What is Fermi energy? Calculate its value for the free-electron gas at 0 K.
41. Discuss the Debye theory of specific heat capacity of a crystalline solid.
42. Discuss the Langevin's classical theory on paramagnetism and its physical significance.
43. (a) Derive the Clausius-Mosotti relation
(b) Differentiate dia- and para- magnetism.
44. Discuss :
(a) Meissner effect
(b) Formation of cooper pair in superconductors.

(2 × 15 = 30 Marks)

(Pages : 3)

L – 1889

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Physics with Computer Applications

Core Course

PC 1642 – STATISTICAL MECHANICS AND QUANTUM MECHANICS

(2015-2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer all questions; each carries 1 mark)

1. What is a phase space?
2. What are bosons?
3. Define ensemble.
4. Give the postulate of equal a priori probability.
5. What is Compton effect?
6. What is a wave function?
7. State correspondence principle.
8. Give the relation connecting entropy and probability.
9. Write deBroglie relation.
10. Write the time independent Schrodinger wave equation.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

(Answer any **eight**; each carries **2** marks)

11. What are Bohr's postulates?
12. Distinguish between microstate and macrostate.
13. Explain Maxwell-Boltzmann distribution law.
14. Explain zero point energy.
15. Write a note on micro canonical ensemble.
16. Explain Fermi-Dirac distribution function.
17. Outline the probability interpretation of wave function.
18. Obtain time dependent form of Schrodinger's equation.
19. Mention any two deficiencies of the Planck's Quantum theory.
20. Explain natural line width of spectral lines using uncertainty principle.
21. Distinguish between group velocity and phase velocity.
22. Write Einstein's photoelectric equation and explain.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six**; each carries **4** marks.

23. What potential difference must be applied to stop the fastest photoelectrons emitted by a surface when electromagnetic radiation of frequency 1.5×10^{15} Hz is allowed to fall on it. Work function of the surface is 5 eV.
24. Determine the deBroglie wavelength of an electron that has been accelerated through a potential difference of 100V.

25. If the uncertainty in the position of an electron is $4 \times 10^{-10} \text{ m}$, calculate the uncertainty in its momentum.
26. Find the energy of an electron moving in one dimension in an infinitely high potential box of width 1 \AA , given mass of electron = $9.11 \times 10^{-31} \text{ Kg}$, $h = 6.63 \times 10^{-34} \text{ Js}$.
27. Find the probability that a particle trapped in a box of width L can be found between $0.45 L$ and $0.55 L$ for the ground state and first excited state.
28. Given the mathematical representation of a spherical wave travelling outward from a point as $\psi(r) = A/r e^{ikr}$, Evaluate its probability current density.
29. A cubic meter of atomic hydrogen at 0°C and at atmospheric pressure contains about 2.7×10^{25} atoms. Find the number of these atoms in their first excited state at 0°C .
30. Find the rms speed of oxygen molecules at 0°C .
31. Calculate the number of phase cells in given energy range of harmonic oscillator.

(6 × 4 = 24 Marks)

SECTION – D

Answer any two; each carries 15 marks.

32. Distinguish between Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics.
33. Discuss the uncertainty principle and its relevance in quantum mechanics.
34. What is photoelectric effect? Describe the laws of photoelectric effect. Derive Einstein's photoelectric equation.
35. Obtain the wavefunction and energy of a particle in a finite potential well.

(2 × 15 = 30 Marks)

(Pages : 4)

L – 1892

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Group 2(a) – Physics and Computer Applications

Core Course

PC.1671 – COMPUTER NETWORKS AND SECURITY

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer **all** questions. Each question carries 1 mark)

1. What do you mean by simplex data flow?
2. Define computer network.
3. What is bandwidth?
4. Expand MIME.
5. What is a domain name?
6. PGP stands for?
7. Who developed RSA algorithm?
8. What is piggybacking?

P.T.O.

9. DES stands for?
10. What is web security?

(10 × 1 = 10 Marks)

SECTION – B

(Answer any eight questions. Each question carries 2 marks)

11. List any four interfacing devices.
12. Define data communication.
13. What is private key cryptography?
14. What do you mean by ciphering?
15. Define network security.
16. What is a stream cipher?
17. What do you mean by authentication?
18. What is a parity bit?
19. What is CRC?
20. Describe hamming code.
21. What is Remote Login?
22. What are trojans?
23. What do you mean by flow control?
24. What is flooding?
25. Write briefly about Satellite Communication.
26. What is anti-virus software? Give an example.

(8 × 2 = 16 Marks)

SECTION – C

(Answer **any six** questions. **Each** question carries **4** marks).

27. Write paragraph on E-mail security.
28. Differentiate public key and private key cryptography.
29. Compare circuit switching and packet switching.
30. Why RSA algorithm is used?
31. Explain the concepts and policies of network security.
32. What is Secure Socket Layer?
33. What is User Datagram Protocol?
34. What is steganography?
35. Write a note on Consumer Protection Act.
36. What is the purpose of sliding window protocol?
37. What is asymmetric key cryptography? Explain with examples.
38. Write a note on Law of Convergence.

(6 × 4 = 24 Marks)

SECTION – D

(Answer **any two** questions. **Each** question carries **15** marks).

39. Explain the types of transmission medias.
40. Explain in detail about TCP/IP model.
41. Discuss in detail, public key Cryptography. Illustrate with examples.
42. Discuss about link state routing

43. Explain in detail

(a) Digital Signature

(b) Message Digest

44. Discuss the concepts of congestion control.

(2 × 15 = 30 Marks)
