



PART – A (10 X 2 = 20 Marks)

Answer Any **TEN** Questions from the following

1. What are the special functions associated with register CX?
2. Give the comparison between procedure and macro.
3. Why does dynamic RAM need refreshing?
4. What is meant by Demultiplexing?
5. How to enable and disable interrupts in 8086 microprocessor?
6. What is masking of interrupts?
7. Give the format of TCON register in 8051.
8. Write a program to perform multiplication of two 8-bit numbers using 8051 microcontroller.
9. What is meant by multitasking? What are their types?
10. Write down the salient features of 80486 microprocessor.
11. Which interrupt has the highest priority in 8086 microprocessor?
12. Write about CALL statement in 8051.

PART – B (5 X 5 = 25 Marks)

Answer Any **FIVE** Questions from the following

13. Describe any five addressing modes of 8086 with suitable examples.
14. Explain the use and operation of stack and stack pointer in detail.
15. Discuss the interrupt sequence of 8259 Programmable interrupt controller.
16. Draw the pin diagram of 8051 microcontroller and explain the function of various signals.
17. List out the difference between 8086 and 80386 microprocessor.
18. Write short note about assembler directives.
19. What are the various objectives and functions of operating systems?

PART – C (3 X 10 = 30 Marks)

Answer Any **THREE** Questions from the following

20. Explain the internal architecture of 8086 microprocessor with a neat diagram.
21. Show the memory organization and interfacing with 8086 microprocessor. Explain how the memory is accessed.
22. Define Interrupt and explain the different types of interrupt supported by 8086.
23. Discuss the data transfer, arithmetic and logical instructions of 8051 microcontroller with suitable examples.
24. Draw the flag register of 80386 processor and discuss the register organization of this processor.



PART – A (10 X 2 = 20 Marks)

Answer Any **TEN** Questions from the following

1. Write any two renewable energy sources.
2. What do you understand by energy storage?
3. What is tidal power?
4. What is marine energy?
5. What are the global winds and local winds?
6. Explain the formula to find the power from wind?
7. What is the origin of biomass energy?
8. What is bio gas?
9. List out the advantages of fuel cells.
10. What is green house effect?
11. What is nuclear energy?
12. What is anaerobic digestion?

PART – B (5 X 5 = 25 Marks)

Answer Any **FIVE** Questions from the following

13. Discuss the obstacles to the implementation of renewable energy system.
14. Explain the process of utilization of energy from oceans.
15. Discuss the aerodynamic forces acting on the blades of a wind mill.
16. Explain the factors bio digestion and gas generation.
17. Define black body radiation explain and explain its role in solar energy.
18. Discuss the advantages and disadvantages of horizontal and vertical axis wind mill.
19. Explain the classification of solar cookers.

PART – C (3 X 10 = 30 Marks)

Answer Any **THREE** Questions from the following

20. Explain various energy sources.
21. Write in detail about the basic principle of tidal power generation.
22. With neat diagram explain the working of wind electrical conversion system.
23. Explain how energy can be produced from biomass.
24. Define solar cell and describe the solar cell characteristics.

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PART – A (10 X 2 = 20 Marks)

Answer Any **TEN** Questions from the following

1. What is the difference between the first and second order phase transition?
2. State the third law of thermodynamics.
3. If a system contains N number of particles with chemical potential μ , What is its Gibb's free energy?
4. What is meant by phase space?
5. Write down the one-particle partition function and hence give the total partition function for a system of N-particles.
6. Compare microcanonical, and grand canonical ensembles with regards to contact with surroundings.
7. For an ideal B –E gas, the number of molecules in low energy state at a temperature 5 K is 7/8 times of total number of molecules. Find the Bose condensation temperature.
8. What are symmetric and antisymmetric wave functions?
9. Write down the conditions for both F-D and B-E statistics approach classical statistics?
10. Give the cluster expansion for the equation of state of a gas.
11. If a macroscopic system contains 10^{23} particles, what is its fluctuation in energy?
12. Mention the assumption of an Ising model.

PART – B (5 X 5 = 25 Marks)

Answer Any **FIVE** Questions from the following

13. Show that the second thermodynamical relation $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$.
14. Deduce an expression for thermodynamic entropy of an ideal gas.
15. If the partition function is give by Z, show that the mean energy $\bar{E} = -\frac{\partial \log Z}{\partial \beta}$.
16. Deduce Plank radiation formula from Bose-Einstein statistics.
17. Derive Maxwell Boltzmann law for the distribution of molecules in a gas.
18. Write a short note on cluster expansion for a classical gas.
19. Explain the fluctuation-dissipation theory.

PART – C (3 X 10 = 30 Marks)

Answer Any **THREE** Questions from the following

20. Discuss Landau theory for paramagnetic to ferromagnetic phase transition. Obtain critical exponents.
21. What is Gibb's paradox? Demonstrate it through the mixing of two different ideal gases and mixing of one ideal gas with the same ideal gas.
22. State and prove Liouville's theorem.
23. Explain Bose-Einstein condensation with a necessary theory.
24. Derive Einstein expression for the diffusion coefficient of molecules $D = \left(\frac{RT}{N}\right) \frac{1}{6\pi\eta r}$.

How will you determine Avogadro number (N) by using the Brownian movement in gases.

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PART – A (10 X 2 = 20 Marks)

Answer Any **TEN** Questions from the following

1. Define nuclear magnetic dipole moment.
2. State the properties of nuclear forces.
3. Give the three forms of β decay.
4. What is meant by nuclear isomerism?
5. What are Schmidt lines?
6. What are the limitations of shell model?
7. State the four-factor formula.
8. Write short notes on plasma confinement.
9. What is strangeness?
10. What are quarks?
11. Briefly explain the concept of iso-spin.
12. State Fermi and Gamow-Teller selection rules in β decay.

PART – B (5 X 5 = 25 Marks)

Answer Any **FIVE** Questions from the following

13. Outline Yukawa's meson exchange theory of nuclear forces.
14. Give a brief account of Fermi's theory of β -decay.
15. Describe Liquid drop model of nucleus. State its usefulness and limitations in understanding the nuclear phenomena.
16. Explain nuclear fusion process with an example.
17. State and explain the CPT theorem.
18. Classify the nuclear transitions of β -decay based on Fermi and Gamow-Teller selection rules. Discuss the allowed and forbidden transitions with suitable examples.
19. Describe the working of pressurized water reactor with a neat sketch.

PART – C (3 X 10 = 30 Marks)

Answer Any **THREE** Questions from the following

20. Give a simple theory of deuteron. Obtain and plot the wave function for the deuteron ground state.
21. Describe Gamow's theory of α -decay.
22. Derive Breit-Wigner dispersion formula for nuclear reactions.
23. Outline the general aspects of nuclear reactor design.
24. Describe the classification of the elementary particles, fundamental interactions and conservation laws.

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PART – A (10 X 2 = 20 Marks)

Answer any **TEN** Questions from the following

1. Write the different types of “Return Values”
2. Write a Short note on ‘Synopsis Writing’.
3. What the geometrical interpretation of Newton Raphson method.
4. Write the Euler’s algorithm for solving differential equations numerically.
5. Illustrate an identifier.
6. What are keywords? Mention some C Keywords.
7. Distinguish between one and two dimensional arrays.
8. State the role of arrays in C.
9. Distinguish between qualitative and quantitative analysis.
10. Write a short note on calling functions.
11. Write the Simpson 3/8 rule.
12. Explain used detained functions.

PART – B (5 X 5 = 25 Marks)

Answer any **FIVE** Questions from the following

13. Write a note on Literature survey.
14. Using Newton-Raphson method, evaluate $\sqrt{8}$.
15. Explain the basic structure of C Program.
16. Explain the initializing arrays with examples.
17. Write a note on diagonalisation and inversion.
18. Discuss the different types of constants in C.
19. Describe the reading and writing strings on the screen.

PART - C (3 X 10 = 30 Marks)

Answer any **THREE** Questions from the following

20. Describe the power point presentation and OHP presentation.
21. Solve the equation $\frac{dy}{dx} = -y$ to find Y for $x = 0.01, 0.02, 0.03$ and 0.04 subject to the initial condition $y(0) = 1$ by Euler's method.
22. How do you classify operators in C? Explain any three types of them with examples.
23. Explain with example, declaration and initializing string variables. Write a note on bitwise operator
24. Write a simple program to solve simultaneous equations.