Banke Bageshwori College

Institute of Science and Technology

2075

Pre-Board Examination

Bachelor Level/First Year/First Semester/Science
Computer Science and Information Technology(PHY113)
(Physics)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks

Group A

Attempt any TWO question. **[2X10=20]**

1. Discuss different process of growth of single crystal.
2. Define electric potential. Find an expression for the electric potential at a point. Hence generalized it for potential difference between two points.
3. Obtain the solution of Schrödinger equation for hydrogen atom. Write the physical significance of the results.

Group B

Attempt any EIGHT questions. **[8X5=40]**

4. State the postulates of Bohr's theory of hydrogen atom and deduce an expression of energy of n^{th} orbit of hydrogen atom.
5. Describe different types of bonding in solids.
6. Describe the junction field effect transistors.
7. An oscillator of mass 10kg has a velocity of 5m/s after 1 second of its crossing the mean position. If the time period is 5s, find the PE and KE at that instant.
8. A beam of electrons moving with velocity $1x10^5$m/s enters normally into the uniform magnetic field of 0.02 tesla. If the specific charge of an electron is $1.8x10^{11}$kg/c, calculate the radius of circular path described by the electrons.
9. What are the shortest and longest wavelength of Lyman series?
10. Calculate the normal Zeeman splitting of calcium 4226A0 when the atoms are placed in a magnetic field of 1.2 tesla.
11. A strip of metal has a diameter 1.02mm, cross-sectional area 8.2x10-7m2 and resistivity 8.2x10-8 ohm-meter. It carries a current of 1.67A. Find the magnitude of electric field intensity in the wire and potential difference between two points in the wire 50m apart.
12. Find the appropriate truth table for the following distributive law of Boolean algebra.
    A (B+C)=AB+AC

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Pre-Board Examination

Bachelor Level/First Year/First Semester/Science
Computer Science and Information Technology(CSC.110)
(C Programming)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks

Group A

Long questions.

Attempt any TWO question. **[2X10=20]**

1. What is algorithm? Write characteristics of writing good algorithm. Write an algorithm to find roots of a quadratic equation. Check all the necessary conditions.
2. What is function? Describe types of functions with suitable practical example.
3. What is structure? How it is differ from union? Write a program in C to read records of 20 students from user then display only record of those student whose age is greatest.

Group B

Short questions.

Attempt any EIGHT questions. **[8X5=40]**

4. Draw a flowchart to determine the largest among three numbers entered.
5. What are the different types of operators available in C? How can you declare the variable in C?
6. Write the syntax for while, do-while and switch statement .Write the example for switch statement.
7. Write a program to obtain the product of two matrices.
8. What are the advantages of using a function? How can you define recursion? Write a recursive program to find factorial of a given number.
9. Justify that a pointer is a jewel in C language. Write a function that accept 10 numbers and sort them in ascending order using pointer.
10. Define a structure of employee having data members name, address, age and salary. Take data for n employee in an array and find the average salary.
11. Write a program to enter name, roll and age of 4 students and write it to a file and display its content.
12. Describe any three graphic function used in C. and also write a program to draw a circle of Centre (x, y) and radius r.

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Pre-Board Examination

Bachelor Level/First Year/First Semester/Science
Computer Science and Information Technology(CSC.109)
(Introduction to Information Technology)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks

Group A

Long questions.

Attempt any TWO question. **[2X10=20]**

1. What is computer memory? Explain different types of memory used in computer system in brief.
2. What is operating system? Explain different functions of operating system in brief.
3. What do you understand by network topology. Explain different types of network topologies.

Group B

Short questions.

Attempt any EIGHT questions. **[8X5=40]**

4. Define a supercomputer and mainframe computer.
5. Difference between CISC and RISC architecture.
6. Define input devices. Explain the various types of the input devices.
7. Convert $(240)_{10}$ into octal number and $(ABC)_{16}$ into binary numbers.
8. Explain different types of transmission mode.
9. What is internet? Explain Dial-up access, leased line and DSL in brief.
10. What is e-commerce? Explain different types of E- commerce.
11. Explain different types of implemented data model.
12. What is multimedia? What are the characteristics of multimedia system.
13. Write short notes on. (any two)
    a) Central processing unit
    b) Data warehouse
    c) Cryptography

Best of Luck

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Pre-Board Examination

Bachelor Level/First Year/First Semester/Science
Computer Science and Information Technology(MTH-112)
(Mathematics I)

Full Marks: 80
Pass Marks: 32
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks

Group A

Attempt any THREE question. **[3X10=30]**

1. a) A function is designed by $f(x) = \begin{cases} x+2 & if\ x<0 \\ 1-x & if\ x>0 \end{cases}$. Calculate f(-1), f(3) and and sketch the graph.
   b) Prove that the limit $\lim_{x\to 0} \frac{|x|}{x}$ does not exist.
2. a) Find the derivative of $f(x) = \sqrt{x}$ and to state the domain of f'.
   b) Sketch the graph of $f(x) = x^{\frac{4}{3}} - 4x^{\frac{1}{3}}$
3. a) Estimate the area between the curve $y^2 = x$ and the lines x = 0 and x= 2.
   b) State the Rolle's theorem. Verify Rolle's theorem for the function $y = \sqrt{1-x^2}$, $[-1,1]$.
4. a) Show that the function $f(x,y) = \frac{2x^2y}{x^4+y^2}$ has no limit as $(x,y) \to (0,0)$
   b) Find correct to six decimal places, the root of the equation cosx=x.

Group B

Attempt any TEN questions. **[10X5=50]**

5. Find the Macular series. Use Macular in expansion. show that
$$sinx = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots\ldots\ldots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + \ldots\ldots\ldots$$
6. Calculate $\iint_R f(x,y)dA$ for $f(x,y) = 100 - 6x^2y$ and $R: 0 \le x \le 2, -1 \le y \le 1$.
7. Find the solution of $y'' + 6y' + 9 = 0$, $y(0) = 2$, $y'(0) = 1$.
8. Define cross product of two vectors. If a = i +3j + 4k and b = 2i +7j – 5k, find the vector a × b and b × a.
9. Find the absolute maxima and minima of $f(x,y) = 2 + 2x + 2y - x^2 - y^2$ on the triangular plate in the first quadrant bounded by the lines x=0, y=0 and x + y = 9.
10. Find the length of the cardioid $r = 1 - cos\theta$.
11. Determine wheather the integral is convergent or divergent.
$$\int_0^{\infty} \frac{x\,arctanx}{(1+x^2)^2}\,dx$$
12. Find the volume of the solid obtained by rotating about the y-axis the region bounded by $y = 2x^2 - x^3$ and y= 0.
13. Show that the unit tangent vector $\vec{T}(t)$ and the principal unit normal $\vec{N}(t)$ of a smooth curve $\vec{r}(t)$ are orthogonal.
14. If $f(x) = \sqrt{x}$ and $g(x) = \sqrt{2-x}$. find fog and gog.
15. Find the third approximation x_3 to the root of the equation $f(x) = x^3 - 2x - 5$, setting $x_1 = 2$.