सत्रीय कार्य / Assignment Work – 2019 - 20

B. Sc. CS (1st Year)

Max Marks – 30   **Min Marks - 10**

निर्देश : सत्रीय कार्य के प्रत्येक विषय में कुल 30 अंक हैं । सभी प्रश्नों के अंक समान होंगे । सभी प्रश्न हल कीजिए । (Assignment Work of each paper carries 30 Marks. All questions carry equal marks. Attempt all questions.)

PAPER - I (COMPUTER FUNDAMENTALS)

1. Explain the basic logic gates with diagram. Write the truth table for NOR, NAND, XOR gate.

2. Convert the following into Octal Number system.

   (i) $(1101)_2$ (ii) $(567)_8$ (iii) $(10A)_{16}$ (iv) $(10010)_2$

3. What is operating system? Write the functions of operating system. What are different types of operating systems?

4. What do you mean by binary arithmetic? Explain various operations in it.

5. What do you understand by compiler and interpreter? Why are they used? Briefly explain computer viruses?

PAPER – II (PROGRAMMING IN 'C')

1. What do you mean by array in "C" language? Explain 1D, 2D and Multi-Dimensional array with example.

2. What do you mean by token in "C"? Explain different types of C tokens.

3. What is 'go to' statement? It is not recommended to use the 'go to' statement. Why?

4. What is string? Write a C program to demonstrate the various functions of strings.

5. What are global and local variables in C? Differentiate between static variable and non-static variable.

PAPER - III (BASIC ANALOG AND DIGITAL ELECTRONICS)

1. Explain sequential circuits with block diagram. What are full adders?

2. Write the logic equation for the following:

   a)   Y = NOT A   b)   Y = A AND B

   c)   Y = A OR B   d)   Y = A AND B AND C

   e)   Y = A OR B AND C

3. What is gray code? How binary code is converted into gray code?

4. With a neat diagram explain the operation of 4-bit SISO (Serial-In Serial Out) register. Draw the timing diagram and give its truth table.

5. What do you mean by encoder? Explain with neat diagram. Why they are used?

1. If $f(x) = u + iv$ is an analytic function of $z = x + iy$ and function of x and y with differentiable coefficients of first two orders, then prove that

   (i) $\left(\frac{\partial \Phi}{\partial x}\right)^2 + \left(\frac{\partial \Phi}{\partial y}\right)^2 = \left\{\left(\frac{\partial \Phi}{\partial x}\right)^2 + \left(\frac{\partial \Phi}{\partial u}\right)^2\right\} |f'(z)|^2$.

2. Prove that the field due to a dipole of moment p at distance r is given by

   $E(r) = \frac{1}{4\pi\varepsilon_0}\left[\frac{3(p.r)}{r^5}r - \frac{p}{r^3}\right]$

   Hence obtain an expression for the energy of a dipole in the field of another dipole.

3. Subtract 3A8 from 1273 in hexadecimal system. Convert binary (110011001010101) to octal number system.

4. What do you mean by electrical susceptibility? Define polarization. Write the relation between electric displacements.

5. What do you mean by electric field strength, define it? State and Prove Gauss's Law.

1. What is Computer Graphics? Explain its areas of application.

2. Explain various line drawing algorithms. Write the steps involved in incremental line drawing algorithm.

3. What do you mean by normalization transformation? Why it is needed?

4. Explain the 3D Co-ordinate system with neat diagram.

5. Describe Parallel Projection with the help of diagram. List the problems in true curve generation algorithm.

1. Find the possible truth values of p, q, r, s, t, for which the following are contradictions :

   (i) $[(p \wedge q) \wedge r] \rightarrow (s \wedge t)$　　　　(ii) $[p \wedge (q \wedge r)] \rightarrow (s \underline{V} t)$

2. Describe Euler circuits and Euler graphs? Explain it with suitable diagram?

3. What is complete graph? Show that a complete graph with n vertices, namely Kn = 1/2n (n-1).

4. Find a generating function for the following recurrence relations:

   (i) $a_{n+2} - 3a_{n+1} - 4a_n = 0, n \geq 0, a_1 = 1, a_2 = 3$.

5. If f: $R \rightarrow R'$ is a homomorphism, then prove that i) f(0) = 0'   ii)   f(a) $\forall$ a $\in$ R .

****