Mangalmay Institute of Engineering & Technology

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HOME Assignment1 (CO1)

SUBJECT NAME (CODE):-MP (KCS-403)   **CLASS:-B.TECH (IVSEM)**

1. Explaintheevolutionofmicroprocessorwithitsdifferentgenerationsindetail.
2. Discuss briefly about the types of Microprocessors.
3. Differentiate between microprocessor and microcontroller.
4. Discuss in detail about the Microprocessor architecture and Operation of its components.
5. Evaluate the functions of ALU in microprocessor.

HOME Assignment2 (CO2)

**SUBJECT NAME (CODE):-MP (KCS-403)**   **CLASS:-B.TECH (IVSEM)**

1. Draw and explain the architecture of 8085 microprocessor, also explain theprogrammer'smodel of 8085.
2. Draw the PIN diagram of 8086 microprocessor and discuss about each pin.
3. Explain how Address and Data Bus are multiplexed in 8085 microprocessor and how de-multiplexing is done. Describe the advantage of using multiplexed Address and Data Buses. Describe the role of ALE signal in DE multiplexing the buses.
4. Discuss the significance of Accumulator in 8085. Evaluate the role of temporary registers in 8085.
5. Explain Program Counter and Stack Pointer? Explain the various general purposes registers available in 8085.

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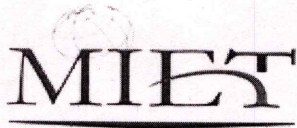
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HOME Assignment3 (CO3)

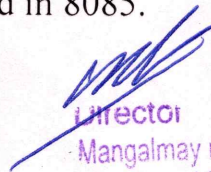**SUBJECT NAME (CODE):-MP (KCS-403)**   **CLASS:-B.TECH (IVSEM)**

1. Explain in detail about the Architecture of 8086 microprocessor with the help of a neat diagram.
2. Discuss the memory segmentation in 8086 and the various segments of the memory.
3. DrawtheFlagregisterof8086.
4. Explain in detail about the Execution Unit and Memory Segmentation of the Microprocessor.
5. Describe the function of BIU and EU in the architecture of 8086 microprocessor.Explain the Register organization of 8086 microprocessor. Explain the function ofsignals: TEST', LOCK'.

HOME Assignment4 (CO4)

SUBJECT NAME (CODE):-MP (KCS-403)   **CLASS:-B.TECH (IVSEM)**

1. What do you understand by the term Instruction sets?
2. Discuss the significance of following signals of 8085 in detail: HOLD, READY, ALE, HLDA, and CLK OUT.
3. Explain the execution of instructions: LXI H 2000H, LDA 2000 H, RAL, JNC, MVI.
4. Illustrate the following instructions of 8085 along-with suitable diagram (i) ADD, ADI (ii) ANA, ANI (iii) RLC (iv) RAL (IV) XTHL
5. Explain the call and Ret instructions used in 8085.

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HOME Assignment5 (CO5)

SUBJECT NAME (CODE):-MP (KCS-403)   **CLASS:-B.TECH (IVSEM)**

1. What do you understand by the Peripheral Devices?
2. Demonstrate the interfacing of output and input devices with 8085 along-with a suitable diagram. Also explain the relevant instructions used.

3. What do you understand by the DMA Controller?
4. Explain the various modes of operation of 8254/53 with examples.Programmable Timer and discuss the control word register.
5. Write short notes on following. i) 8259 programmable interrupt controller ii) 8251 USART

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Assignment1 (CO1)

SUBJECT NAME (CODE):- DAA (KCS-503)   **CLASS:-B.TECH (VSEM)**

1. What is an Algorithm? What are the characterics of an algorithm?
2. Compare (in terms of running time, asymptotic notation) brute force sorting algorithm with insertion sort.
3. What is the running time of QUICKSORT when all elements of array A have the same value?
4. Compare best, average and worst case scenarios for quick sort and randomized quick sort.
5. Write pseudo code for adding two n-bit binary numbers and find its complexity.

Assignment2 (CO2)

SUBJECT NAME (CODE):- DAA (KCS-503)   **CLASS:-B.TECH (VSEM)**

1. Explain Skip List in brief.
2. Write an algorithm for insertion of key in the Red Black Tree. Discuss the various cases for insertion of key in red-black tree for given sequence of key in an empty red black tree :**5,16,22,25,2,10,18,30,50,12,1**
3. Explain and write an algorithm for union of two binomial heaps and also write its time complexity.
4. Explain Applications of FFT in brief.
5. Define Feasible and optimal solution.

Assignment 3 (CO3)

SUBJECT NAME (CODE):- DAA (KCS-503)   **CLASS:-B.TECH (VSEM)**

1. How Greedy algorithm is different from Dynamic programming?
2. Explain Bellman Ford Algorithm.
3. Write Dijkstra's algorithm to find the shortest path. Explain it with example.
4. What do you mean by graph? Explain various graph traversing algorithms with examples.
5. Write pseudo code to find transpose of a given input graph.

Assignment4 (CO4)
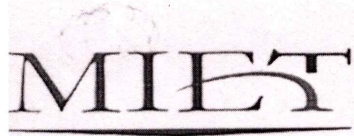
SUBJECT NAME (CODE):- DAA (KCS-503)   **CLASS:-B.TECH (VSEM)**

1. Write Floyd-Warshall Algorithm to find all pair shortest path. Also show step by step execution on any graph.

2. What is Dynamic Programming? Explain with suitable example. What are the features and drawbacks of dynamic programming?

3. What do you mean by backtracking? Explain one situation which cannot be solved without backtracking approach.

4. What is travelling salesman problem (TSP)? Find the solutions of Following TSP using dynamic programming.

0	1	15	6
2	0	7	3
9	6	0	12
10	4	8	0

5. Discuss n queen's problem. Solve 4 queens problem using backtracking method.
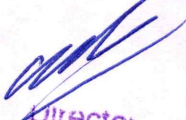
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Assignment-5 (CO5)

SUBJECT NAME (CODE):-Design and Analysis of Algorithm (KCS-503)

CLASS:-B.TECH (VSEM)

1. Define P, NP, NP-Hard and NP-Completeness. Is P=NP?
2. Explain a procedure to prove that a problem is NP-Complete.
3. Explain the Rabin-Karp algorithm for string matching with q=11, T=3141592653598793 and P=26.
4. What do you mean by approximation algorithm? Explain set covering problem with respect to approximation algorithm
5. Explain Naïve string matching problem.

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Assignment 1 (CO1)

SUBJECT NAME (CODE):- BAS203 : ENGINEERING MATHEMATICS-II

CLASS:- B.TECH (IISEM)

1. Solve $(D^2 - 4D + 4)y = 8x^2 e^{2x} \sin 2x$.

2. Solve the following simultaneous differential equations:

$$\frac{dx}{dt} + 5x - 2y = t, \quad \frac{dy}{dt} + 2x + y = 0, \quad given\,that \ x = y = 0, \ when \ t = 0.$$

   Solve $\dfrac{d^2 y}{dx^2} - 2\tan x \dfrac{dy}{dx} + 5y = e^x \sec x$

3. By changing the independent variable, solve the differential equation

$$\frac{d^2 y}{dx^2} - \frac{1}{x}\frac{dy}{dx} + 4x^2 y = x^4$$

4. By changing the independent variable, solve the differential equation

$$\cos x \frac{d^2 y}{dx^2} + \sin x \frac{dy}{dx} - 2y \cos^3 x = 2\cos^5 x$$

5. Solve by the method of variation of parameters:

$(a)\ \dfrac{d^2 y}{dx^2} + a^2 y = \sec ax.$ $(b)\ \dfrac{d^2 y}{dx^2} + y = \tan x.$ $(c)\ (D^2 - 1)y = 2(1 - e^{-2x})^{-1/2}$

$(d)\ \dfrac{d^2 y}{dx^2} - 3\dfrac{dy}{dx} + 2y = \dfrac{e^x}{1 + e^x}.$

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Assignment 2 (CO2)

SUBJECT NAME (CODE):- BAS203 : ENGINEERING MATHEMATICS-II

CLASS:- B.TECH (IISEM)

1. Find Laplace transform of the following :

    i) $e^t t^{-\frac{1}{2}}$

    ii) $t^2 e^t \sin 4t$

    iii) $t^2 \sin at$

    iv) $te^{-t} \sin 2t$

2. Find $L\{F(t)\}$, where $F(t)$ is defined by $F(t) = \begin{cases} \sin t, 0 < t < \pi \\ 0, \pi < t < 2\pi \end{cases}$ and $F(t + 2\pi) = F(t)$

3. If $f(t)$ is a periodic function with period T, i.e. $f(t + T) = f(t)$, then prove that

$$L\{f(t)\} = \frac{1}{1 - e^{-pT}} \int_0^T e^{-pt} f(t) dt.$$

4. Find Laplace transform of $\dfrac{\cos at - \cos bt}{t}$

5. Solve Differential Equations by Laplace Transform

   1. $y''' + 2y'' - y' - 2y = 0$, where $y(0) = 1, y'(0) = 2, y''(0) = 2$, Ans $y = \frac{1}{3}\left(5e^t + e^{-2t}\right) - e^{-t}$

   2. $y'' - 3y' + 2y = 4t + e^{3t}$, where, $y(0) = 1, y'(0) = -1$, Ans, $y = 3 + 2t + \frac{1}{2}\left(e^{3t} - e^t\right) - 2e^{2t}$

   3. $x'' + 9x = \cos t$ where, $x(0) = 1, x\left(\frac{\pi}{2}\right) = -1$, Ans, $x = \frac{1}{5}\left(\cos 2t + 4\cos 3t + 4\sin 3t\right)$

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Assignment 3 (CO3)

SUBJECT NAME (CODE):- BAS203 : ENGINEERING MATHEMATICS-II

CLASS:- B.TECH (IISEM)

Q-1   Find the Fourier series expansion for $f(x) = x + \frac{x^2}{4}, \quad -\pi \le x \le \pi$.

Q-2   Find the Fourier series for the function $f(x)$ in the interval $(-\pi, \pi)$ when
$$f(x) = \begin{cases} \pi + x, & -\pi < x < 0 \\ -\pi - x, & 0 < x < \pi \end{cases}$$

Q-3 Find the Fourier series for the function $f(x) = \begin{cases} 0, & -\pi < x \le 0 \\ x, & 0 \le x \le \pi \end{cases}$

Q-4 Find the Fourier expansion for the function $f(x) = x - x^3$ in the interval $-1 < x < 1$. ?

Q-5 Find the half-range cosine series for the function $f(x) = x(\pi - x); \quad 0 < x < \pi$.

Assignment 4 (CO4)

SUBJECT NAME (CODE):- BAS203 : ENGINEERING MATHEMATICS-II

CLASS:- B.TECH (IISEM)

Q-1   Discuss the analyticity of the function $f(z) = z . \bar{z}$
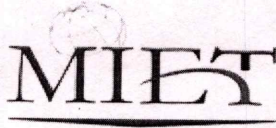
Q-2   Show that $f(z) = \log z$ is analytic everywhere in the complex plane except at the origin and that its derivative is $\frac{1}{z}$.

.Q-3   Show that the following function $u(x, y) = x^4 - 6x^2y^2 + y^4$ is harmonic .Also find the analytic function $f(z) = u(x, y) + iv(x, y)$.

Q-4   Determine an analytic function $f(z)$ in terms of z whose real part is $e^{-x}(x \sin y - y \cos y)$.

.Q-5 If $f(z)$ is a regular function of Z, prove that $\left\{\frac{\partial}{\partial x}|f(z)|\right\}^2 + \left\{\frac{\partial}{\partial y}|f(z)|\right\}^2 = |f'(z)|^2$

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Assignment 5 (CO5)

SUBJECT NAME (CODE):- BAS203 : ENGINEERING MATHEMATICS-II

CLASS:- B.TECH (II SEM)

Q-1 Evaluate by Cauchy integral formula $\oint_C \frac{z^2-2z}{(z+1)^2(z^2+4)} dz$ where $C \equiv |z| = 3$.

Q-2 Evaluate using Cauchy's integral formula $\oint \frac{e^{2z}}{(z+1)^5} dz$ where C is the circle $|z| = 2$.

Q-3 Evaluate the following integrals using Cauchy's residue theorem :

$$\oint_C \frac{cos\pi z^2 + sin\pi z^2}{(z-1)^2(z-2)} dz; \ C \equiv |z| = 3.$$

Q-4 Evaluate using Cauchy's integral formula $\oint \frac{1}{(z^2+9)} dz$ where C is the circle $|z + 3i| = 2$

Q-5 Evaluate the following integrals by using contour integration;

$$\int_{-\infty}^{\infty} \frac{cosx}{(x^2+a^2) \ (x^2 + b^2)} dx; \ a > b > 0$$