

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Anshul Mawya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida

T1 Examination Odd Semester 2022

B.Tech 5th Semester

Course Name: Sociology of Media

Max Time: 1 Hr

Course Code: 16B1NHS435

Max Marks: 20

After the completion of the course, students will be able to:

- CO1** Demonstrate a basic understanding of different concepts used in the systematic study of Sociology of Media
- CO2** Examine various sociological theoretical orientations towards media and society
- CO3** Analyze the key issues related to the processes of Production of Media, Popular Culture and consumer culture
- CO4** Critically evaluate the cultural consumption, social class and the process of construction of subjectivities and audience reception in new media
- CO5** Create positive and critical attitude towards the use of new media and understanding of threats of digital age

Note: Attempt All Questions

- Q.1** Media Literacy is defined as the ability to access, analyse, evaluate and communicate messages in a variety of forms. It builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy. Media Literacy is based on certain foundation principles. Explain any two principles of Media Literacy and support your answer with suitable examples. [6 marks, CO1]
- Q.2** Why is it important to see an audience as “constructed” rather than as objectively real? Evaluate your answer in the context of media theories. [4 marks, CO4]
- Q.3** Examine the difference between functionalist viewpoint of digital surveillance and the conflict viewpoint of surveillance. Discuss with examples. [4 marks, CO2]
- Q.4** How would you interpret media as a gatekeeper? Analyse the various gate-keeping functions of media with examples from the Indian context. [6 marks, CO3]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Vishesh Maurya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
T1 Examination, 2022
B.Tech(Vth Semester) ECE

Course Title: Microprocessor and Microcontroller

Maximum Time: 1 Hour

Course Code: 15B11FC313

Maximum Marks: 20

Note: All the questions are compulsory.

Course Outcomes		Cognitive Levels
CO1	Recall the basics of digital circuits , specifications and applications	Remembering Level (C1)
CO2	Familiarization with the basic of 8 bit, 16 bit and 32 bit Microprocessor/ Microcontroller and their internal architecture	Understanding Level (C2)
CO3	Use the knowledge of different instruction of 8085 and Microcontroller 8051, to write various program in assembly Language.	Applying Level (C3)
CO4	Interface the Memory Chips and peripherals chips , LED , LCD, keyboard, motors and sensors	Analyzing Level (C4)

Q1. (a) With a neat labelled diagram of internal architecture of 8085. [2] CO2

(b) Discuss all the addressing modes in 8085, with suitable examples. [2] CO2

Q2. (a) What is the importance of ALE signal? Explain clearly. [2] CO2

(b) Find the Data and Address lines for the following memory chips : [2] CO1

(i) **8192 X 8**

(ii) **2072 X 3**

Q3. For an assembly language program below , written for 8085 [4] CO3

2000H MVI A, 05H

MVI B, 05H

2004H ADD B

DCR B

JNZ 2004H

ADI 03H

HLT

At the end of the program , find the content of the accumulator and length of each instruction.

Q4. Draw a neat and properly labelled timing diagram for LDA 2050H. Content of the location 2050H is 55H. Instruction is written at memory location 2001H. [4] CO2

Q5. Obtain the address range of the memory chip in Figure 1., by analysing the circuit properly. [4] CO3

Figure 1 is on the next page.

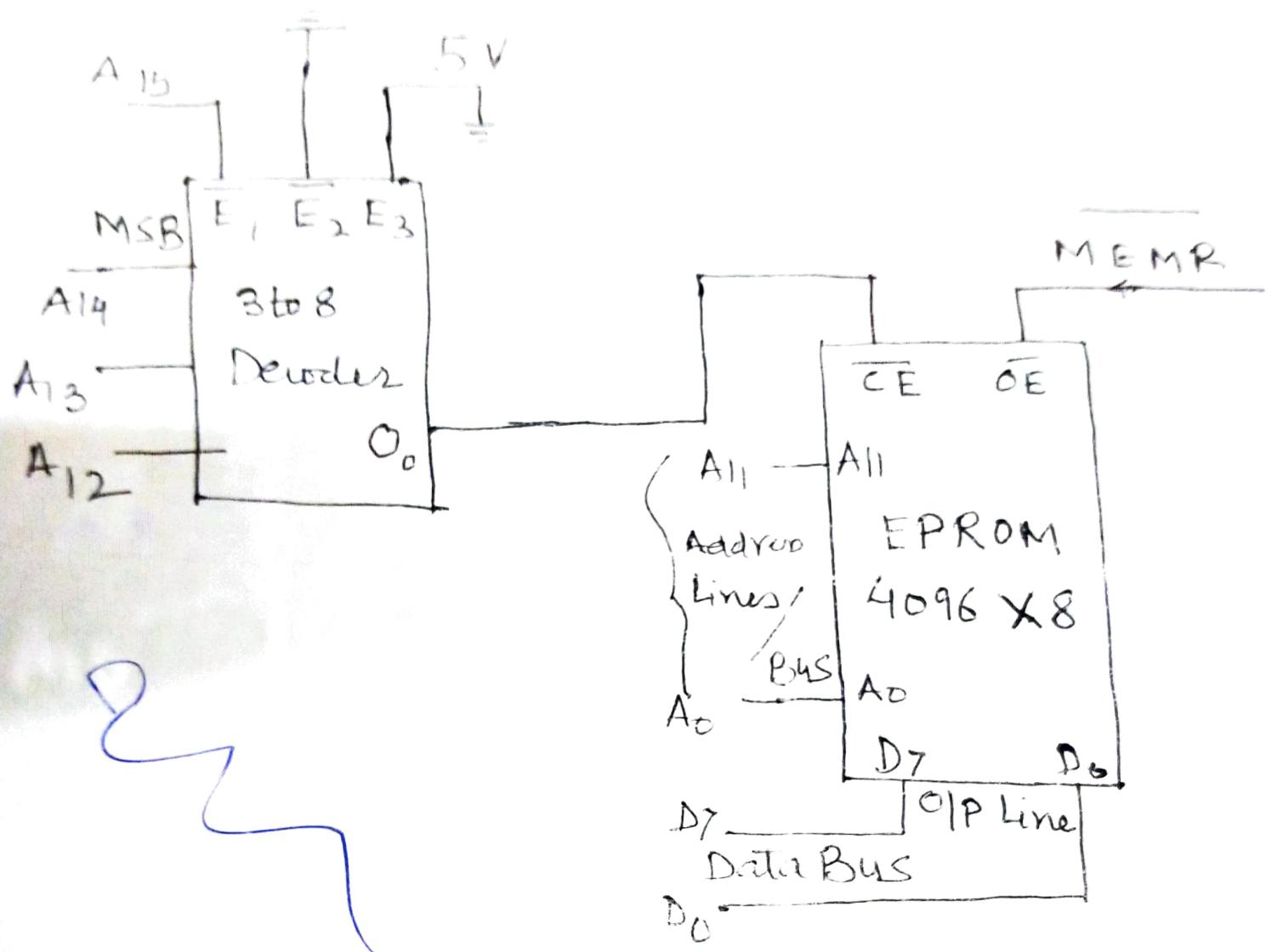


Figure 1.

Name Anshul Mawaya

Enrollment No. 9920102081

Jaypee Institute of Information Technology, Noida

T1 Examination, ODD Semester 2022

B. Tech. V Semester

Course Name: Electromagnetic Field Theory
Course Code: 18B11EC312

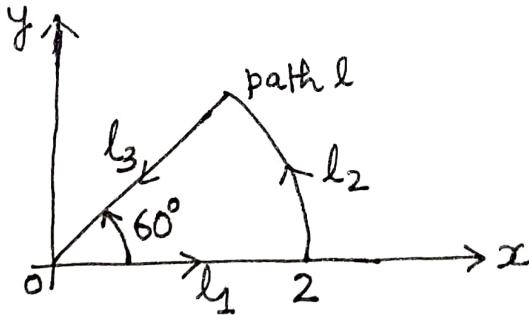
Maximum Marks: 20
Maximum Time: 1 Hr

After pursuing the above mentioned course, the students will be able to:

- CO1: Recall concepts of vector calculus to solve complex problems and relate among different coordinate systems. Explain the basic principles of electrostatics and magnetostatics and relate the electric and magnetic fields using Maxwell's equations.
- CO2: Illustrate the propagation of EM waves in different medium and their reflection and transmission parameters. Distinguish among different wave polarizations.
- CO3: Estimate the current voltage and power for the different types of transmission lines. Determine reflection parameters. Demonstrate the waveguide theory, wave equations and evaluate different waveguide parameters.
- CO4: Classify and compare the different parameters associated with the antennas and also interpret the radiation mechanism.

Note: Attempt all questions

- Q. 1 (a)** Given two vectors $\vec{A} = 0.5\hat{a}_x - 2.2\hat{a}_y + 1.6\hat{a}_z$ and $\vec{B} = 2.6\hat{a}_x + 0.8\hat{a}_y - 2.7\hat{a}_z$. Find [2M, CO1] the vector component of \vec{B} along \vec{A} .
- (b)** Convert point P (4, 30°, 60) from Spherical to Cartesian and Cylindrical coordinates. [2M, CO1]
- Q. 2** Find the circulation of a vector $\vec{B} = \rho \cos \phi \hat{a}_\rho + z \sin \phi \hat{a}_z$ around the path shown in [4M, CO1] figure given below. Also verify it using Stoke's theorem.



- Q. 3** A point charge of $2\mu\text{C}$ is situated at P (0, 4, 0) and an infinite uniformly charged line with charge density of 100 nC/m placed along the z axis. Find the electric field intensity at (3, 4, 0). [3M, CO1]
- Q. 4** The electric field $\vec{E} = \frac{10^6}{\rho} \hat{a}_\rho \text{ V/m}$ in a cylindrical region defined by $0.01 \leq \rho \leq 0.05$, $0 \leq \phi \leq 2\pi$, and $0 \leq z \leq 0.5$. Determine the electric energy stored in the region assuming free space. [2M, CO1]
- Q. 5** The interface between two dielectrics is defined by $x = 0$ plane. For dielectric 1, $x > 0$, $\epsilon_{r1} = 3$ and for dielectric 2, $x < 0$, $\epsilon_{r2} = 4$. If the electric flux density in region 1 is given by $\vec{D}_1 = 4\hat{a}_x + 6\hat{a}_y + 8\hat{a}_z \text{ C/m}^2$, find electric flux density in region 2 (\vec{D}_2). [3M, CO1]
- Q. 6** In a free space, the magnetic flux density is $\vec{B} = y^2 \hat{a}_x + z^2 \hat{a}_y + x^2 \hat{a}_z \text{ Weber/m}^2$. [4M, CO1]
 - (a) Find the magnetic flux through $x=1$, $0 < y < 1$, and $1 < z < 4$.
 - (b) Calculate \vec{J} .

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Amitpal Mawya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida

Test – 1 Examination, 2022

B.Tech, Vth Semester

Course Title: 15B11C1518

Maximum Time : 1 hr

Course Code: Data Structures and Algorithms

Maximum Marks : 20

After pursuing this course, the students will be able to:

CO1. Apply fundamental operations on data structures such as linked-lists, trees, binary search trees, AVL trees, heap trees, graphs and hash tables.

CO2. Apply and compare different sorting and searching algorithms.

CO3. Identify suitable data structure and develop solution for the given problem.

CO4. Formulate solutions for programming problems or improve existing code using algorithms such as Backtracking, Branch and Bound, Greedy Algorithm and Dynamic Programming.

Attempt all the questions

1. [CO1] The ranks of employees working in a sales company are stored using a doubly link list. Every node of the list stores the following details of an employee: Empid, Name, Sale_of_month. Details of the employees are stored in descending order based on the Sale_of_month. For example, if employee with ID as 101, has Sale_of_month as 10 while employee with ID as 102 has Sale_of_month as 30 then employee 102 will be placed before employee 101 in the link list. Assume that the Sale_of_month made by an employee is unique. Write a complete program to perform the following operations:

- (a) [1 marks] Design the structure of the node for doubly link list.
 (b) [2 marks] Insert the details of 5 employees in descending order based on the Sale_of_month.
 (c) [2 marks] Display the details of employees where Sale_of_month is less than 10. Analyze the complexity of the proposed approach.

2. [CO1] Solve the following using asymptotic notations

- (a) [2 marks] $f(n) = 3n^3 + 5n - 2$. Find the values for C_1 , C_2 and n_0 for which $f(n) = \theta(g(n^3))$.
 (b) [2 marks] $f(n) = 7n + 2$ and $g(n) = n^2$ find whether n^2 is upper bound for this function or not using Big-oh notation? Which upper bound will you pick n or n^2 ? Explain with help of graph.

3. [CO1] With respect to stack perform the following operations:

- (a) [2 marks] Convert the following expression into postfix notation. Show all steps of conversion of the expression.

$$2 + 3 * (8 - 5) / 3 + 7 - (2 * 3) + 8$$

- (b) [1 marks] Evaluate the resultant postfix notation from 3(a). Show all steps of evaluation of the expression.

4. [CO2][4 marks] Design the linear search function to search an element in an array using recursion. Also, design a recurrence relation for the above recursive function. Compute its time complexity using Substitution/Recursion tree method. Show all steps of computation.

5. [CO2] Let A[] be an array of n integers. It is required to find the pair of two integers x and y in A such that their difference is minimum. For example, if A={7, 14, 5, 20, 4, 9} then |(5 - 4)| gives the minimum of |(x - y)|. Write an efficient algorithm/program to find the pair in A[].

- (a) [2 marks] if A[] is sorted

- (b) [2 marks] and if A[] is unsorted.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Aishul Mawya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida

**T1 Examination, 2022
B.tech 5th Semester**

**Course Title : Indian Constitution and Traditional Knowledge Maximum Time : 1 hr
Course Code : 20B13HS311 Maximum Marks : 20**

Course Outcomes:

- CO1: Demonstrate an understanding about the early Indian traditional political thought and the constitutional design by knowing about the structure of government in place
- CO2: Demonstrate an understanding of the role of Indian president, prime minister, governor and other members of the legislature and local governments as representatives of the common masses
- CO3: Analyze the working of Indian federalism with reference to centre-state relations
- CO4: Analyze the impact of the contemporary challenges such as caste and gender to the working of Indian democracy
-

Note: Attempt all questions

- Q1. Despite the significance of both fundamental rights and Directive principles of state policy (DPSP), there arises a conflict due to the fact that one is justiciable while the other is not. In this regard there have been many landmark cases. What is the outcome of Golaknath case? Analyze the difference between Golaknath and Keshavnanda Bharati case? 2+2 marks, CO1
- Q2. What are the various exceptions to the right to equality of opportunity in matters of public employment? 4 marks, CO1
- Q3. Discuss in details any two salient features of the Indian Constitution. Why is India known as "quasi federation"? 2+2 marks, CO1
- Q4. What are the remedies for the enforcement of fundamental rights guaranteed under the Indian Constitution? Explain in detail. 4 marks, CO1
- Q5. "Fundamental duties are not made enforceable like the fundamental rights, but they are fundamental to the well being of the society and individuals." Examine the statement with reference to any four fundamental duties and examples to substantiate your viewpoint. 4 marks, CO1

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Anshul Mawya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida

Test-2 Examination, ODD 2022

B.Tech (ECE) V Semester

Course Title : Electromagnetic Field Theory

Maximum Time : 1 hour

Course Code : 18B11EC312

Maximum Marks : 20

CO1 Recall concepts of vector calculus to solve complex problems and relate among different coordinate systems. Explain the basic principles of electrostatics and magnetostatics and relate the electric and magnetic fields using Maxwell's equations.

CO2 Illustrate the propagation of electromagnetic waves in different medium and their reflection and transmission parameters. Distinguish among different wave polarizations.

CO3 Estimate the current, voltage and power for the different types of transmission lines, determine reflection parameters. Demonstrate the waveguide theory, wave equations and evaluate different waveguide parameters.

CO4 Classify and compare the different parameters associated with the antenna and also interpret the radiation mechanism.

Note: Attempt all questions.

Q1. An H field travels in the $-\hat{a}_z$ direction in free space with a phase constant of 30 rad/m and an amplitude of $1/3\pi$ A/m. If the field has the direction $-\hat{a}_y$, when $t = 0$ and $z = 0$, write suitable expressions for E and H fields. Calculate the frequency and wavelength of the wave. **[CO2, 4Marks]**

Q2. A uniform plane wave in air is normally incident on an infinite lossless dielectric material having $\epsilon = 3\epsilon_0$ and $\mu = \mu_0$. If the incident wave is $E_i = i0 \cos(\omega t - z)\hat{a}_y V/m$, find the following: **[CO2, 4Marks]**

- λ and ω of the wave in air.
- The incident H_i field.
- Γ (Reflection Coefficient) and τ (Transmission Coefficient).
- The total electric field in both media.

Q3. A current sheet, $K = 9\hat{a}_y A/m$ is located at $z = 0$, the interface between region 1, $z < 0$ with $\mu_{r1} = 4$ and region 2, $z > 0$ with $\mu_{r2} = 3$. Given that $H_2 = 14.5\hat{a}_x + 8\hat{a}_z A/m$, find H_1 . **[CO1, 4Marks]**

Q4. The time domain expression for the magnetic field of a plane wave travelling in non magnetic medium is given by the following expression:

$H(x,t) = 0.2 \cos(6\pi \times 10^8 t - 10.2x)\hat{a}_z A/m$. Find **[CO2, 4Marks]**

- The direction of wave propagation.
- The dielectric constant and the intrinsic impedance.
- The time domain expression of the electric field.
- The time average power density.

Q5. A uniform plane wave in air with the following expression for incident electric field $E_{s1} = (4.1\hat{a}_x - 2.9\hat{a}_z)e^{-j(6.0x+8.6z)}V/m$ is incident on the air dielectric interface. The dielectric medium occupied by the region $z > 0$ is characterized by non magnetic lossless dielectric with $\mu_{r2} = 1$, $\epsilon_{r2} = 2.25$ and $\sigma_2 = 0$. Find **[CO2, 4Marks]**

- The expression for the reflected electric and magnetic fields.
- The expression for the transmitted magnetic field.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Anshul Mawaya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
Test - 2 Examination, ODD Semester 2022
B. Tech. 5th Semester

Course Name: Data Structures and Algorithms
Course Code: 15B11CI518

Maximum Marks: 20
Maximum Time: 1 Hr

After pursuing the course the students will be able to

C311.1: Apply fundamental operations on data structures such as linked lists, trees, binary search trees, AVL trees, heap trees, graph and hash tables.

C311.2: Analyze and compare different sorting and searching algorithms.

C311.3: Identify suitable data structure and develop solution for the given problem.

C311.4: Formulate solutions for programming problems or improve existing code using algorithms such as backtracking, branch and bound, greedy and dynamic programming.

1. [C311.1] The pre-order traversal sequence of a Binary Search Tree (BST) is given as – 30, 20, 10, 15, 25, 23, 39, 35, 42.
 - a. [2 Mark] Construct the BST for this given sequence.
 - b. [2 Mark] Construct a max heap using the in-order traversal sequence of the BST in 1(a). Show all steps of insertion.
 - c. [2 Mark] Perform heap sort to sort the elements of the max heap created in 1(b). Show all intermediate steps.
 - d. [1 Mark] You are given an array A[] consisting of 10 distinct numbers in descending order. Draw comparison on the height of BST and Heap created using array A[].
2. [C311.1] Consider the following sequence: 10, 20, 15, 25, 30, 16, 18, 19.
 - a. [2 Marks] Insert the above sequence in an empty AVL Tree.
 - b. [1 Mark] Write the number of RR, LR, LL, RL rotations required to insert the given sequence into an empty AVL tree.
 - c. [1 Mark] Delete 30 from the AVL tree constructed in 2(a).
 - d. [1 Mark] Prove that the maximum height of an AVL tree with n nodes is $\log n$.
3. [C311.2] [2 marks] You are given two arrays A[] and B[]. Array A[] contains numbers from 51 to 100 and Array B[] contains number from 101 to 150. The numbers in both arrays are arranged in ascending order. The task is to merge both the arrays A and B into one sorted array using the merge function from merge sort. Justify the total number of comparisons performed in merging both the arrays.
4. [C311.2][3 Marks] We want to sort the following elements: 93, 56, 2, 7, 91, 44, 22, 63, 89, 23. Suggest a sorting algorithm, which is not comparison based, that would be appropriate for this case. Show step by step solution to sort the given elements.
5. [C311.2][3 marks] You are given an array A[] consisting of only 2's, 4's, and 8's. Write an algorithm/pseudo code to sort the elements of array A[] in an efficient manner. For example:
Input: A = [2, 4, 4, 2, 4, 8, 4, 8, 2]
Output: A = [2, 2, 2, 4, 4, 4, 8, 8].

Name: *Shantil Mawya*

Enrollment No.9920102089

Jaypee Institute of Information Technology, Noida
T2 Examination, Oddsem 2022
B.Tech V Semester

Course Title: Laser Technology and Applications**Max. Time: 1hr**
Max. Marks: 20**Course Code: 16B1NPH533**

After pursuing the course, the students will be able to

- CO1** Define the coherent properties, high brightness of laser, population inversion and optical feedback to laser technology
- CO2** Extend the knowledge of lasers in some applications like LIDAR, laser tracking, barcode scanner, lasers in medicine and lasers in industry
- CO3** Apply the optical ray transfer matrix to determine the stability of a laser resonator
- CO4** Distinguish the operational principles of CW, Q-switched, mode locked lasers; laser rate equations for three & four level lasers; different types of laser systems

Note: Attempt all the questions.

- Q.1 [CO2] (a) Sketch the intensity and beam patterns of TEM₀₂ mode.
 (b) Identify each of the following broadening mechanisms as homogeneous or inhomogeneous.
 - i. Collisions between atoms in a gas.
 - ii. Randomly spaced impurities in a semiconductor crystal.
 - iii. Temperature differences between different regions of the gain medium.
 - iv. Vibrational relaxation within an energy band of an atom or semiconductor.
 (c) The half width of the gain profile of a laser (wavelength 632.8 nm) is 0.002 nm. What would be the maximum length of the cavity so as to have a single longitudinal mode oscillation?
 (d) Write the main difference between Q-switching and Mode locking. Which technique is used to mode lock and Q-switch the laser simultaneously?

[2x4]

- Q.2 [CO4] (a) Using the dispersion relation, find out the oscillation frequency of laser modes in a three-dimensional closed cavity (sides a, b, d). Also, show that the frequency separation between two adjacent transverse modes is,
- $$\Delta\nu_m = \Delta\nu_q \frac{\lambda d}{2a^2} \left(m + \frac{1}{2} \right).$$
- Symbols used have their usual meanings
- (b) Consider a typical cavity of He-Ne laser with the following specifications: L = 20 cm, n₀ = 1, R₁ = 1, R₂ = 0.98, α_{eff} ≈ 0. For such a cavity, calculate cavity lifetime, FWHM of the spectrum and the frequency separation between adjacent longitudinal modes.
- (c) Show the time variation of loss, Q-value, population inversion and laser output power. Further, discuss the working of electro-optic Q-switching of laser by showing suitable schematic.

[4x3]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Anshul Maurya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
T2 Examination, 2022
B.Tech V Semester

Course Title: Indian Constitution and Traditional Knowledge Max. Time: 1 hr.
Course Code : 20B13HS311 Maximum Marks : 20

Course Outcomes:

CO1:Demonstrate an understanding about the early Indian traditional political thought and the constitutional design by knowing about the structure of the government in place.

CO2: Demonstrate an understanding of the role of the Indian President, prime minister, governor and other members of the legislature in their mutual interaction and local governments as representatives of the common masses.

CO3:Anlayze the working of the Indian federalism with reference to centre-state relations.

CO4: Analyze the impact of contemporary challenges such as caste and gender to the working of the Indian democracy.

Note: Attempt all questions

Q1. Although the governor of a state as its nominal head is bound by the aid and advice of the council of ministers, he enjoys certain powers where he can use his own judgement which are of course, within constitutional purview. What are these powers of governor called? Give two examples. 1+3 marks, CO2

Q2. "The constitution of India provides for a unified judiciary." Analyze the given statement. Discuss the original jurisdiction of the Supreme Court. 2+2 marks, CO2

Q3. Explain in detail the judicial powers of the President of the India. 4 marks, CO2

Q4. Briefly discuss the question hour and three kinds of question proceedings of Indian parliament. 4 marks, CO2

Q5. Discuss the powers of the Indian Prime minister in relation to the council of ministers. 4 marks, CO2

Name Ashutosh Manjrekar

Enrollment No. 9920602089

Jaypee Institute of Information Technology, Noida

**T2 Examination, Odd Semester 2022-23
B.Tech (ECE) V Semester**

**Course Title : Microprocessor and Micro controller
Course Code : 15B11EC313**

**Maximum Time : 1 Hr
Maximum Marks : 20**

Course Outcome	
CO1	To recall the basics of digital circuits , specification and applications.
CO2	Familiarized with 8 bit, 16 bit and 32 bit Microprocessor and Microcontroller and their internal organization.
CO3	Use the knowledge of 8085 microprocessor / 8051 microcontroller to write the different programs in assembly language.
CO4	To Interface the memory chips and peripheral chips , LEDs, LCD, Keyboards, motors and sensors with 8085 Microprocessor and 8051 Microcontroller.

Note: All questions are compulsory.

Q. 1. CO3. Write a delay subroutine to produce a time delay of 0.5 ms in 8085 processor based system, where clock source is 6.0 MHz [4]

Q.2. CO3. Assume that 8085 microprocessor return to main program, after servicing RST 6.5 (while servicing an interrupt ,all other interrupt are disabled) .Write a program segment to check whether RST 5.5 is pending. If it is pending ,the program has to enable the RST 5.5 without affecting any other interrupts. Otherwise, the program has to enable all interrupts and return to main program. [4]

Q.3.CO2. (a) Write the major difference between microprocessor 8085 and 8086. [2]

CO2.(b) What are the basic difference between Microprocessor and Microcontroller. [2]

Q.4. (a) Write the alternative functions of port pins of 8051 microcontroller. [2]

(b) What is DPTR in 8051 microcontroller? [1]

(c) How we select a register bank in 8051 ? [2]

Q.5. CO3. For microcontroller 8051, write an assembly language program to add two numbers, of 8 bit each, stored in memory location 2400 H and 2401 H, and store the result in 2402 H and 2403 H. [3]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE

Name... *Dinesh Malwya*

Enrollment No..... *9920102089*.....

Jaypee Institute of Information Technology, Noida T-2 Examination, Odd Semester 2022 B. Tech. V Semester

**Course Title: Sociology of Media
Course Code: 16B1NHS435**

**Maximum Time: 1 Hr.
Maximum Marks: 20**

After completion of the course, students will be able to:

- CO1 Demonstrate a basic understanding of different concepts used in the systematic study of Sociology of Media
- CO2 Examine various sociological theoretical orientation towards media and society
- CO3 Analyse the key issues related to the processes of production of media, popular culture, and consumer culture
- CO4 Critically evaluate the major methods of cultural consumption, social class, and the process of construction of subjectivities and audience reception in New Media
- CO5 Create positive and critical attitude towards the use of new media and understanding of threats of Digital Age

Note: Attempt All Questions

- Q.1) How do functionalist theorists view pop culture? Does pop culture have a dark side? [6 marks, CO3]
Analyse with examples.
- Q.2) Sociologists mark distinction between different kinds of cultures in the society. With [4 marks, CO2] reference to the different culture, examine the difference between folk culture and high culture? Explain with suitable examples.
- Q.3) Traditional means of communication refers to methods used in a specific culture for [6 marks, CO1] communication of ideas and dissemination of information. One of the categories of Traditional media is flexibility. Explain this category and its sub-types.
- Q.4) Define New Media and critically evaluate its role in democratic politics. [4 marks, CO5]

Name Anshul MawayaEnrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
End Term Examination, Odd Semester 2022
B. Tech. Vth Semester

Course Name: Microprocessors and Microcontrollers
Course Code: 15B11EC313

Maximum Time: 2Hrs
Maximum Marks: 35

- CO1** Recall the basics of digital circuits, specification and applications.
- CO2** Familiarization with the basics of 8 bit, 16 bit and 32 bit Microprocessor/Microcontroller and their internal architecture.
- CO3** Use the knowledge of different instructions of 8085 and Microcontroller 8051, to write various program in assembly language.
- CO4** Interface the memory chips and peripherals chips, LED, LCD, keyboard, motors and sensors.

Note: Answer all questions.

Q1. [CO1] Explain the classification of memories and differentiate RAM and ROM on the basis of 4 parameters.

[3]

Q2. [CO3] (a) Write an assembly-language program for 8085 to pack the two unpacked BCD numbers.

[4]

[CO2] (b) Explain addressing modes of 8085 microprocessor.

[3]

Q3. [CO3] Write a subroutine assembly-language program for 8085 to generate delay of 10ms (assume 0.33 us clock cycle).

[4]

Q4. [CO3] (a) Assume Timer 0, Mode 1 and XTAL=11.0592 MHz. What value do we need to load into the timer's register if we want to have a time delay of 10ms? Show the program for Timer 0 to create a pulse width of 10ms on P3.2.

[3]

(b) Explain in brief TMOD register. Find the value of TMOD to operate as a Timer 0 in Mode 2.

[3]

Q5. [CO3] (a) Write an assembly-language program for 8051 to receive the data which has been sent in serial form and send it out to Port-1 in parallel form. Also save the data at RAM location 70H.

[3]

(b) Explain in brief SCON register. What is the role of TI and RI flag?

[3]

Q6. [CO4] (a) Assume that one common cathode seven-segment module is connected with Port-1 and common pin is permanently grounded. Write an assembly-language program for 8051 to display number from 0 to 9 repeatedly in a sequence on seven segment modules. Provide the time delay between two numbers.

[3]

(b) What is status of RS, R/W, when sending a data to the LCD?

[1]

Q7. [CO4] (a) Write an assembly-language program for 8051 to rotate a stepper motor by 80° in the clockwise direction using a full-step sequence. Consider the motor has a step angle 2°.

[3]

(b) Explain the operating mode of 8255-PPI.

[2]

Name Amitesh Mawaya

Enrollment No. 992010 2089

Jaypee Institute of Information Technology, Noida
END TERM EXAMINATION, Odd Semester-2022
B.Tech V Semester

Course Title: Electromagnetic Field Theory
Course Code: 18B11EC312

Maximum Time: 2Hr.
Maximum Marks: 35

- After pursuing the above mentioned course, the students will be able to
- CO1** Recall concepts of vector calculus to solve complex problems and relate among different coordinate systems.
Explain the basic principles of electrostatics and magnetostatics and relate the electric and magnetic fields using Maxwell's Equations.
- CO2** Illustrate the propagation of electromagnetic waves in different medium and their reflections and transmission parameters. Distinguish among different wave polarizations.
- CO3** Estimate the current, voltage and power for the different types of transmission lines, determine reflection parameters. Demonstrate the waveguide theory, wave equations, and evaluate different waveguide parameters.
- CO4** Classify and compare the different parameters associated with the antenna and also interpret the radiation mechanism.

Note: Attempt all questions in order.

Q. 1 [CO1] Given the vector field $\vec{G} = (16xy - z)\hat{a}_x + 8x^2\hat{a}_y - x\hat{a}_z$. [1M+2
M]

(a) Is \vec{G} solenoidal?

(b) Find the net flux of \vec{G} over the cube $0 < x < 1$, $0 < y < 1$, and $0 < z < 1$.

Q. 2 [CO1] (a) Given $\vec{D} = z\rho \cos^2 \varphi \hat{a}_z \text{ C/m}^2$, calculate the charge density at $(1, \pi/4, 3)$ and [3M]
the total charge enclosed by the cylinder of radius $\rho = 1 \text{ m}$ with $-2 \text{ m} \leq z \leq 2 \text{ m}$.

(b) Calculate the ratio of conduction current density to displacement current density in a good dielectric for which the conductivity is $1.2 \times 10^{-9} \text{ S/m}$ and the relative permittivity is 5. The frequency of field intensity that varies harmonically with time is 10^9 Hz .

Q. 3 [CO2] (a) The electric field of a time harmonic uniform plane wave in free space is given by: [1M+1
M+2M]

$$\vec{E} = 10^{-3}(1+j)e^{-j(2\pi/3)x}\hat{a}_z \text{ V/m}$$

Assuming the distance x is measured in meters, find (a) the wavelength (in meters)
(b) the frequency, and (c) the associated magnetic field.

(b) The electric field intensity of a uniform plane wave in free space is given by: [1M+1
M]

$$\vec{E} = 40 \cos(\omega t - \beta z)\hat{a}_x + 60 \sin(\omega t - \beta z)\hat{a}_y \text{ V/m}$$

(i) What is the wave polarization?

(ii) Determine the sense of rotation with justification.

Q. 4 [CO3] A 50Ω lossless line is connected to a source with $v_g = 20 \angle 0^\circ \text{ V}_{rms}$ and $Z_g = 20 + 15j \Omega$ and terminated with a load of $Z_L = 60j \Omega$. If the line is 50 m long and $\beta = 0.5 \text{ rad/m}$. Calculate Input Impedance (Z_{in}) and Voltage (V) at:

(a) The sending end, (b) the receiving end (c) 10 m from the source.

Q. 5 [CO3] A distortionless line operating at 120 MHz has $R = 20 \Omega/\text{m}$, $L = 0.3 \mu\text{H}/\text{m}$, and $C = 63 \text{ pF/m}$. Determine :

(a) Propagation Constant (γ), (b) wave velocity (v), (c) characteristic impedance (Z_0)

Q. 6 [CO3] A rectangular waveguide with dimensions $a = 2.5 \text{ cm}$, $b = 1 \text{ cm}$ is to operate below 8.2 GHz . How many TE and TM modes can the waveguide transmit if the guide is filled with a medium characterized by $\sigma = 0$, $\epsilon = 4\epsilon_0$, $\mu = \mu_0$? Calculate the cut-off [3M]

frequencies of the modes. Also arrange in the order in which these modes will enter into the waveguide.

- Q.7 [CO3]** In a rectangular waveguide for which $a = 1.5$ cm, $b = 0.8$ cm, $\sigma = 0$, $\epsilon = 4\epsilon_0$, $\mu = \mu_0$ [1M+1
M+1M+
1M]
$$H_z = 4 \sin\left(\frac{\pi x}{a}\right) \cos\left(\frac{3\pi y}{b}\right) \sin(2\pi \times 10^{11} t - \beta z) \text{ A/m}, E_z = 0$$

Determine: (a) The mode of operation, (b) the cut-off frequency (f_c) (c) the guided phase constant (β_g), and (d) the intrinsic wave impedance.

- Q. 8 [CO4]** (a) Calculate the maximum effective aperture area of a lossless antenna [2M] considering maximum gain of 1.5 dB in free space at a frequency of 100 MHz.
(b) Define the following: [1M+1]
(i) Radiation Pattern, (ii) Radiation Efficiency (iii) Half Power Beam Width [M+1M]
(HPBW)
- *****

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE

Name Dritshul Maurya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
End Semester Examination, Odd Semester 2022
B.Tech. V Semester

Course Title: Sociology of Media

Maximum Time: 2 Hrs

Course Code: 16B1NHS435

Maximum Marks: 35

After pursuing this course, the students will be able to:

- CO1 Demonstrate a basic understanding of different concepts used in the systematic study of Sociology of Media
- CO2 Examine various sociological theoretical orientations towards media and society
- CO3 Analyse the key issues related to the processes of Production of Media, Popular Culture and consumer culture
- CO4 Critically evaluate the Cultural Consumption, Social Class & the process of construction of subjectivities and audience reception in new Media
- CO5 Create positive and critical attitude towards the use of new media and understanding of threats of Digital Age

Note: Attempt all the questions

Q1. Discuss four technological trends that has enabled the growth of new media (**CO1, 4 Marks**).

Q2. The mass media today are seen as playing a key role in enhancing globalization and facilitating cultural exchange and flow of information between countries through international news broadcasts, film, and music. In this context answer the following questions:

- a) How is the media sector ideal for globalization? (**CO3, 3 Marks**)
- b) Analyse the positive and negative effects of globalization of media. Support your answer with relevant example. (**CO3, 4 Marks**)

Q3. According to Robert Merton (1968), a functionalist, differentiates between the media's visible and hidden functions. In the light of functionalist perspective, discuss the following components and examine with relevant examples:

- a) Manifest function
- b) Latent function
- c) Dysfunction

(CO2, 7 Marks)

Q4. What is the impact of pop culture on community practices? Assess using suitable examples. (**CO3, 3 Marks**).

Q5. There has continued to be controversy about how active the typical media audience really is and about what activity means. After reviewing the different meanings and concepts of audience activity, five different versions of audience activities are found in the literature. Write a brief note on each of the audience's activities (**CO4, 5 Marks**).

Q6. "If liberty means anything at all, it means the right to tell people what they do not want to hear." Analyze the statement in light of free speech media. (**CO5, 6 Marks**)

Q7. Distinguish between three types of audience research tradition. (**CO1, 3 Marks**)

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Aishul Manya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida
End Term Examination, 2022
B.Tech 5th Semester

Course Title: Indian Constitution and Traditional Knowledge
Course Code: 20B13HS311

Maximum Time: 2Hrs.
Maximum Marks: 35

After pursuing the course, the students will be able to:

- CO1 Demonstrate an understanding about the early Indian traditional political thought and the constitutional design by knowing about the structure of government in place
- CO2 Demonstrate an understanding of the role of Indian president, Prime minister, Governor, other members of the legislature in their mutual interaction and local government as representatives of the common masses
- CO3 Analyze the working of Indian federalism with reference to centre-state relations.
- CO4 Analyze the impact of the contemporary challenges such as caste and gender to the working of Indian democracy

Note: Attempt all questions.

- | | | |
|-----|--|-------------|
| Q1. | “Freedom of speech is guaranteed not only by Indian Constitution but also by United nations.” Describe the importance and limitations of freedom of speech mentioned in the Indian Constitution. | [3 marks] |
| Q2. | Discuss the status and significance of fundamental duties. Enumerate the steps that can be taken to make them more effective. | [3+1 marks] |
| Q3. | Assess as to how the system of urban government has been constitutionalized. | [4 marks] |
| Q4. | Investigate the impact of a national emergency on centre-state relations, fundamental rights and life of Lok Sabha. | [7 marks] |
| Q5. | Illustrate in detail the multifunctional role of Parliament. | [5 marks] |
| Q6. | Examine the concept of gender equality with reference to the Indian Constitution. | [7 marks] |
| Q7. | Analyze how caste is still a challenge for Indian democracy. | [5 marks] |

Name...Anahul Mawya

Enrollment No.....9920602087

Jaypee Institute of Information Technology, Noida
End Term Examination, 2022
B.Tech V Semester

Course Title: Laser Technology and Applications
Course Code: 16B1NPH533

Max. Time: 2hr
Max. Marks: 35

After pursuing the course, the students will be able to

- CO1** Define the coherent properties, high brightness of laser, population inversion and optical feedback to laser technology
- CO2** Extend the knowledge of lasers in some applications like LIDAR, laser tracking, barcode scanner, lasers in medicine and lasers in industry
- CO3** Apply the optical ray transfer matrix to determine the stability of a laser resonator
- CO4** Distinguish the operational principles of CW, Q-switched, mode locked lasers; laser rate equations for three & four level lasers; different types of laser systems

Note: Attempt all the questions.

Q.1 [CO4] Explain the function of de-Broglie wavelength in quantum well lasers. For GaAs material, effective masses of electron and hole are $0.067 m_0$ and $0.46 m_0$ respectively. Calculate the effective bandgap and emission wavelength for quantum well laser of width 3 nm.
Given, $(E_g)_{bulk} = 1.41\text{eV}$ and $m_0 = 9.1 \times 10^{-31} \text{ kg}$ [5]

Q.2 [CO4] What is the chemical formula of YAG? Draw the energy level diagram of Nd:YAG laser. [5]

Q.3 [CO4] What is the active medium in Excimer lasers? Plot the potential energy of a rare gas halide molecule as a function of distance in excited and ground states. [5]

Q.4 [CO3] A laser beam has a wavelength of 720 nm and aperture 5 mm. The laser beam is focused towards moon. The distance of moon from earth is $4 \times 10^8 \text{ m}$. Calculate (a) the angular spread and (b) axial spread, when the beam reaches to moon. [5]

Q.5 [CO3] Form the ABCD matrix for a ray undergoing (i) reflection and refraction at a plane mirror and (ii) traveling distance 'd' in free space. [5]

Q.6 [CO3] Write the stability condition for an optical resonator. Plot the stability diagram and show the points of planar, confocal and concentric cavity in the diagram. [5]

Q.7 [CO2] What is LIDAR. Discuss the working of LIDAR by showing suitable diagram(s). Also, write the full name of LASIK and LIGO. [5]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Amitul Mawya

Enrollment No. 9920102089

Jaypee Institute of Information Technology, Noida

End Term Examination, 2022

B.Tech Vth Semester

Course Title : 15B11CI518

Maximum Time : 2 hr

Course Code : Data Structures and Algorithms

Maximum Marks : 35

Attempt All Questions. Use of calculator is allowed.

CO1: Apply fundamental operations on data structures such as linked-lists, trees, BST, AVL, heap, graphs and hash tables.

CO2: Analyze and compare different sorting algorithms- Merge Sort, Quick Sort, Shell Sort and Bucket Sort.

CO3: Identify suitable data structure and develop solution for the given problem.

CO4: Formulate solutions for programming problems or improve existing code using algorithms such as backtracking, branch and bound, greedy algorithms and dynamic programming

Q1. [CO4] [Marks 4] Given a String, write a program/algorithm to print all the permutations of the input string using backtracking. Example Input: abc Output: abc, acb, bac, bca, cab, cba.

Q2. [CO4] [Marks 4] Consider the following instance of fractional knapsack: no. of items = 3, W (weight of knapsack) = 20kg, P (profit of each item) = (24, 25, 15) and w (weight of each item) = (18, 15, 20). Find the best possible solution for the given instance.

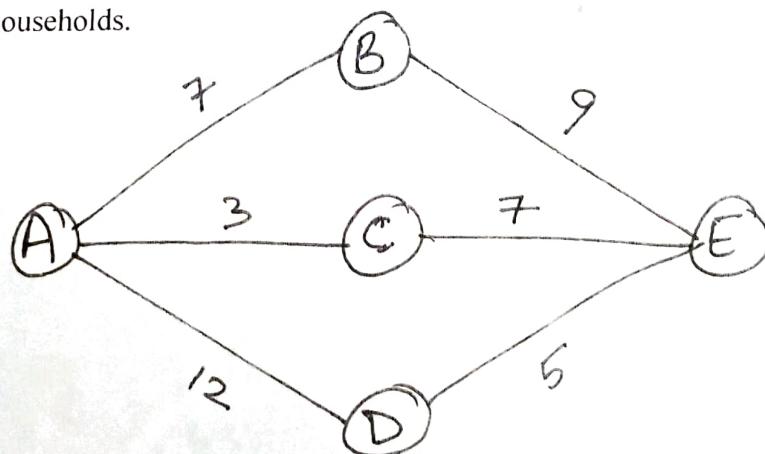
Q3. [CO3] Given two sequence X = {abcbdbab} and Y = {bdcabab}.

- a) [Marks 1] Identify an appropriate approach to find the longest common subsequence for both the sequences.
- b) [Marks 4] Show all the steps involved in the approach to find the longest common subsequence.

Q4. [CO1][Marks 5] Suppose we have a hash table of size 20. We want to put some elements in the hash table using double hashing for collision resolution. The elements are {96, 48, 63, 29, 87, 77, 48, 65, 69, 94, 61}

$h_1(x) = x \bmod 20$, $h_2(x) = x \bmod 13$. Show the steps to store the elements in the hash table.

Q5. [CO3] A fiber company ABC is expanding its internet services in various areas nowadays. Recently they laid the fiber in an area and came up with a central hub (C). Now, to provide internet connectivity to the registered households, ABC team wants to provide the fiber cables from central hub C to each of the household. the cost of fiber line between different nodes is given in the graph shown in figure below. As the fiber cables are very costly, the team wants to connect the households and the central hub in such a way that minimizes the total length of the fibers connecting the households.



a) [Marks 1] Given the graph and the central hub C, which algorithm should be used by ABC team to decide a layout and why?

b) [Marks 4] Show all necessary steps involved in the construction of the layout and compute the cost for the ABC team.

Q6. [CO2][Marks 4] Given a list of names, write an algorithm/ a pseudocode/ a program to sort the names in alphabetic order.

Q7. [CO1]

```
#define MAX(x, y) ((x>y)?x:y)

struct BTNode{
    int data;
    struct BTNode *left;
    struct BTNode *right; };
typedef struct BTNode *Node;
```

The following code is used in the main method
for(int i=0;i<6;i++)
 f(root,X,i)

Consider the following code:

```
static int pos = 0;
int X[50] = {0};
void f(Node node, int X[], int index)
{ if (node == 0) {return;}
if (index == 0) {X[pos++] = node->data;}
else {
    f(node->left, X, --index);
    f(node->right, X, --index);}
```

a)[Marks 4] For the tree given below, analyze what the above function f() is doing, and write the elements recorded in the array X and what is the final value of the variable pos after the execution of the code.

b) [Marks 4] In the following, function mdeep() indicates the maximum depth. For the tree given below, what the following function is doing and what is the result of the function call func(root)?

```
int func(Node root)
{ if (root != NULL){
    return MAX((mdeep(root->left)+mdeep(root->right)+1),
    MAX(func(root->left), func(root->right)));
}
else {return 0;}}
```

