

(R19) 2021 BATCH I M.TECH I SEMESTER REGULAR & SUPPLEMENTARY END EXAMINATIONS MAY-2022

TIME TABLE

TIME:01.30 PM TO 04.30 PM

Date	CIVIL Engg.	Electrical & Electronics Engg.	Mechanical Engg.		Electronics & Communication Engg.	Computer Science & Engg.
	SE	PID	Thermal Engg	Machine Design	DECS	
16.05.2022	ADVANCED ENGINEERING MATHEMATICS (19MSE1TH01) ✓	ELECTRICAL MACHINE MODELLING AND ANALYSIS (19MPE1TH01)	RESEARCH METHODOLOGY AND IPR (19MTE1TH01)	COMPUTATIONAL METHODS IN ENGINEERING (19MMD1TH01)	DIGITAL SYSTEM DESIGN (19MDE1TH01) ✓	ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS (19MCS1TH01) ✓
17.05.2022	THEORY OF ELASTICITY (19MSE1TH02) ✓	DISTRIBUTED GENERATION AND ITS IMPACTS (19MPE1TH02)	ADVANCED THERMODYNAMICS (19MTE1TH02)	ADVANCED MECHANICS OF SOLIDS (19MMD1TH02)	EMBEDDED REAL TIME OPERATING SYSTEMS (19MDE1TH08) ✓	COMPUTER ORGANIZATION AND OPERATING SYSTEMS (19MCS1TH02)
18.05.2022	MATRIX ANALYSIS OF STRUCTURES (19MSE1TH03) ✓	ANALYSIS OF POWER ELECTRONIC CONVERTERS AND INVERTERS (19MPE1TH03)	ADVANCED HEAT AND MASS TRANSFER (19MTE1TH03)	ANALYSIS AND SYNTHESIS OF MECHANISMS (19MMD1TH03)	VLSI TECHNOLOGY AND DESIGN (19MCE1TH02) ✓	DATABASE MANAGEMENT SYSTEMS (19MCS1TH03) ✓
19.05.2022	ADVANCED STRUCTURAL ENGINEERING (19MSE1TH04) ✓	FLEXIBLE AC TRANSMISSION SYSTEM (19MPE1TH04)	ADVANCED IC ENGINES (19MTE1TH04)	MECHANICAL VIBRATIONS (19MMD1TH04)	OPTICAL COMMUNICATION TECHNOLOGY (19MDE1TH09) ✓	MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (19MCS1TH04) ✓
20.05.2022	REPAIR AND REHABILITATION OF STRUCTURES (19MSE1PE07) ✓	POWER SEMICONDUCTOR DEVICES AND PROTECTION (19MPE1PE05)	FUELS AND COMBUSTION (19MTE1PE06)	DESIGN FOR MANUFACTURING AND ASSEMBLY (19MMD1PE08)	DIGITAL DATA COMMUNICATIONS (19MCE1TH03) ✓	COMPUTER NETWORKS (19MCS1TH05) ✓
21.05.2022	ADVANCED CONCRETE TECHNOLOGY (19MSE1PE10) ✓	REACTIVE POWER COMPENSATION AND MANAGEMENT (19MPE1PE08)	THERMAL AND NUCLEAR POWER PLANTS (19MTE1PE10)	MATERIAL TECHNOLOGY (19MMD1PE12)	WIRELESS COMMUNICATION AND NETWORKS (19MCE1TH06) ✓	ADVANCED SOFTWARE ENGINEERING (19MCS1TH06) ✓

NOTE:

- I. ANY OMISSION OR CLASHES IN THIS TIME TABLE MAY PLEASE BE INFORMED TO THE CONTROLLER OF EXAMINATIONS, IMMEDIATELY.
- II. EVEN IF GOVERNMENT DECLARES HOLIDAY ON ANY OF THE ABOVE DATES, THE EXAMINATIONS SHALL BE CONDUCTED AS USUAL.
- III. THE HOD'S ARE REQUESTED TO INFORM THE EXAMINATION SECTION (AUTONOMOUS) ANY OTHER SUBSTITUTE SUBJECTS THAT ARE NOT INCLUDED IN THE ABOVE LIST IMMEDIATELY.

CHIEF CONTROLLER OF EXAMINATIONS

Subject Code: 19MSE1TH01

M.Tech - I Semester Regular & Supple Examinations, May-2022
ADVANCED ENGINEERING MATHEMATICS
(SE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Calculate mean and median of the following data relating to weight of 120 articles :[CO1,K5,6M]

Weight (in gms)	0-10	10-20	20-30	30-40	40-50	50-60
No. Of articles	14	17	22	26	23	18

- (b) Find out the standard deviation of the following : [CO1,K1,6M]

Age under (years)	10	20	30	40	50	60	70	80
No. Persons dying	15	30	53	75	100	110	115	125

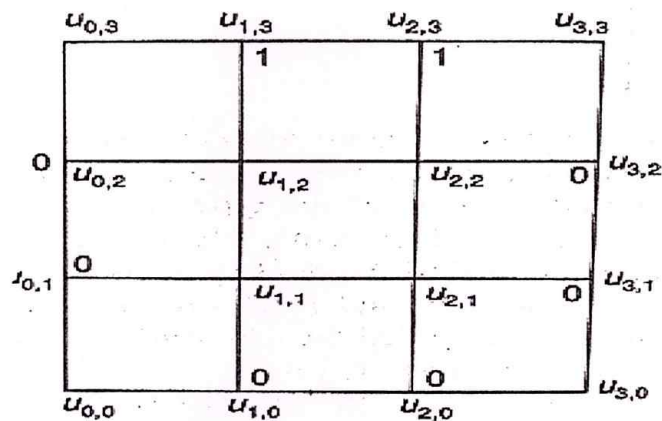
2. (a) Find the curve of the best fit of the type $y = ae^{bx}$ to the following data by the method of least squares. [CO3,K1,6M]

X	1	5	7	9	12
Y	10	15	12	15	21

- (b) Calculate the regression equations of Y on X from the data given below [CO3,K5,6M]

X	10	12	13	12	16	15
Y	40	38	43	45	37	43

3. A tightly stretched string of length l with fixed ends is initially in equilibrium position. It is set to vibrating by giving each point a velocity $v_0 \sin^3\left(\frac{\pi x}{l}\right)$. Find the displacement $y(x,t)$. [CO2,K1,12M]
4. Solve the Laplace the equation $u_{xx} + u_{yy} = 0$ in the domain of the figure.[CO2,K3,12M]



5. Find the values of $u(x, t)$ satisfying the parabolic equation $\frac{\partial u}{\partial t} = 4 \frac{\partial^2 u}{\partial x^2}$ and the boundary conditions

$u(x, 0) = 0 = u(8, t)$ and $u(x, 0) = 4x - \frac{1}{2}x^2$ at the points $x = i: i = 0, 1, 2, \dots, 8$ and $t = \frac{1}{8}j: j = 0, 1, 2, 3, 4, 5.$

[CO2, K1, 12M]

6. Solve the boundary value problem defined by $y'' - x = 0, y(0) = 0, y'(1) = -\frac{1}{2}$ by the Rayleigh-

Ritz method [CO2, K3, 12M]

7. (a) Solve $x^2 \frac{d^2 y}{dx^2} + 3x \frac{dy}{dx} + y = \frac{1}{(1-x)^2}$ [CO2, K3, 6M]

(b) Solve $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = \log x \sin(\log x)$ [CO2, K3, 6M]

8. Use Galerkin's method to solve the boundary value problem

$y'' - y + x = 0 (0 \leq x \leq 1), y(0) = y(1) = 0.$ Compare your approximate solution with the exact solution. [CO4, K4, 12M]

Subject Code: 19MSE1TH03

M.Tech - I Semester Regular & Supple Examinations, May-2022

MATRIX ANALYSIS OF STRUCTURES

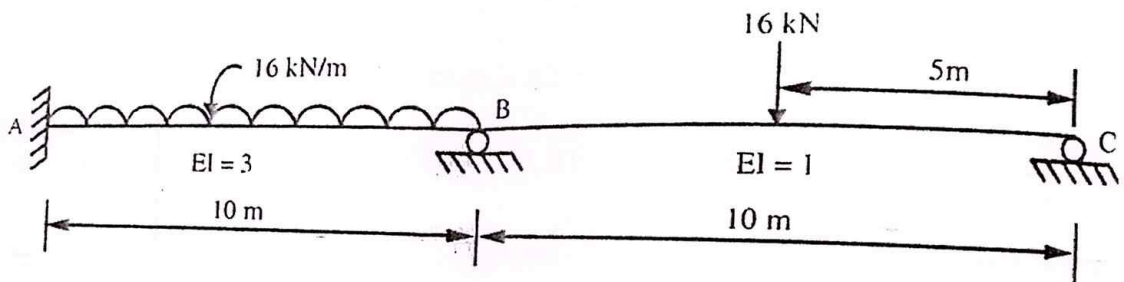
(SE)

Time: 3 hours

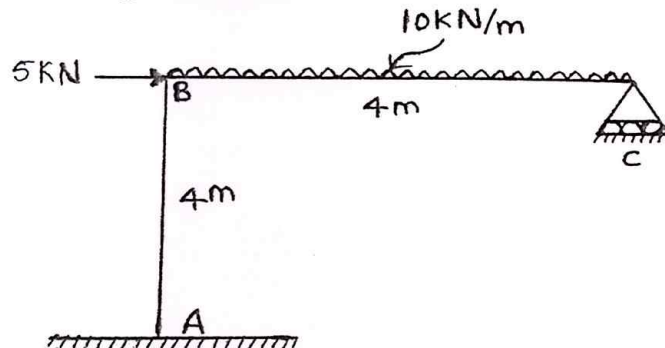
Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

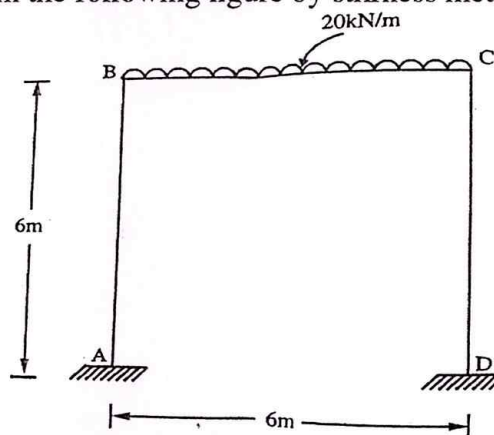
- What is meant by degree of static indeterminacy and degree of kinematic indeterminacy of structure? Explain them through examples. [CO1,K1,6M]
 - Compare and contrast the flexibility and stiffness method? [CO1,K2,6M]
- Analyze the continuous beam in the following figure by flexibility method. [CO2,K3,12M]



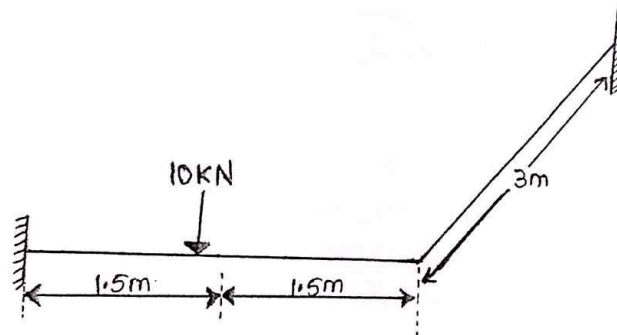
- Develop stiffness matrix for a given frame? [CO2,K3,12M]



- Analyze the frame shown in the following figure by stiffness method. [CO3,K3,12M]



5. Formulate S_{FF} matrix for the grid shown in the following figure $EI = \text{constant}$ & $GJ = \text{constant}$ for both the member. Take $GJ = 0.8 EI$. [CO4,K3,12M]



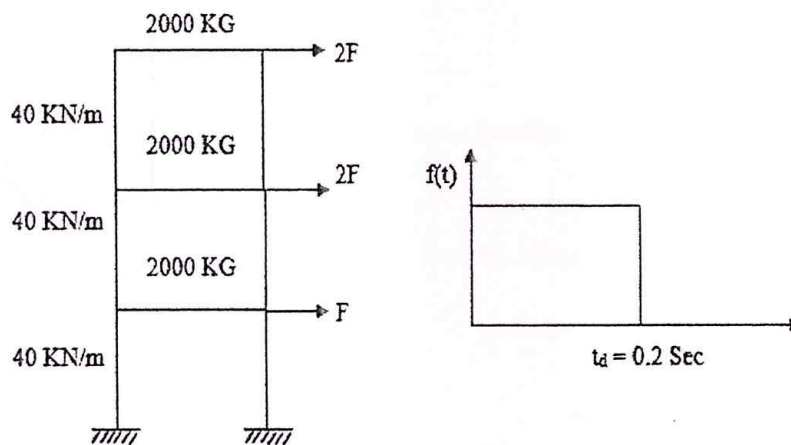
6. Derive rotation transformation matrix for a space truss member with example? [CO4,K3,12M]
7. Explain about the usage of GTSTRUDL/STAAD/SAP to solve the problems in trusses, beams and frames. [CO5,K2,12M]
8. a) Explain about inertial and thermal stresses. [CO6,K2,6M]
b) Explain about Beams on elastic foundation by stiffness method. [CO6,K2,6M]

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

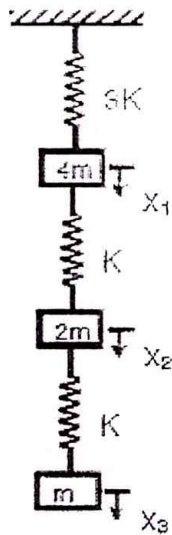
1. (a) What is D'Alembert's principle? Explain how the principle is employed in vibration problems. [CO1, K1, 6M]
- (b) Write short notes on Degree of freedom [CO1, K1, 6M]
2. (a) Derive the equation of motion for the vibration of a SDOF system for $\xi > 1$ [CO3, K4, 6M]
- (b) What is mathematical model with specific reference to structural dynamics. [CO2, K2, 6M]
3. (a) What is time history analysis? Give the steps of analysis [CO1, K2, 6M]
- (b) A single degree of freedom system is excited by a sinusoidal force. The displacement observed at resonance is 50 mm. When the frequency ratio is 10, the displacement is 5mm. Estimate the damping ratio of the system. [CO3, K3, 6M]
4. Draw the mode shapes for given problem [CO4, K3, 6M]



$F = 2$ KN

5. For the given system, find the lowest natural frequency by Stodola's method

[CO5, K3, 6M]



6. (a) Explain about response of shear buildings for forced vibration for harmonic loading

[CO3, K2, 6M]

(b) Write about condition of damping uncoupling

[CO5, K1, 6M]

7. Draw the mode shapes for uniform beam having one end fixed other end simply supported

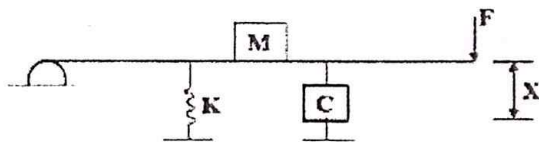
[CO5, K3, 6M]

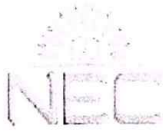
8. (a) Explain about lumped mass and Continuous mass system.

[CO4, K2, 6M]

(b) Derive the equation of motion for given system

[CO4, K4, 6M]





Subject Code: 19MSE1TH02

M.Tech - I Semester Regular & Supple Examinations, May 2022

THEORY OF ELASTICITY

(SE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.

All questions carry EQUAL marks

1. (a) List the six components of strain. Derive the strain components between the same for the different planes (CO1,K2,6M)
(b) Explain plane stress and plane strain with examples. (CO1,K2,6M)
2. (a) Discuss the various stress cases obtained by taking third order polynomial as Airy's Stress function (CO2,K2,6M)
(b) Derive stress-strain displacement relations for Cartesian coordinate system (CO2,K4,6M)
3. (a) What are the stress invariants? Derive expression for the stress invariants (CO3,K4,6M)
(b) Derive the expression for principal stresses in three dimensions (CO3,K4,6M)
4. (a) State Hooke's law and explain about pure shear (CO1,K2,6M)
(b) Explain about components of strain at a point (CO2,K2,6M)
5. (a) Explain the general equation for thick cylinder under uniform internal pressure (CO2,K2,6M)
(b) Discuss about stress concentration with one example (CO2,K2,6M)
6. Explain and derive the equation for the Prandtl's membrane analogy (CO3,K2,12M)
7. (a) Explain the membrane analogy, applied to a narrow rectangular section (CO2,K2,6M)
(b) Write about Saint venant's principle (CO1,K1,6M)
8. Derive the governing equation and the boundary for non-circular section subjected to torque load. (CO5,K5,12M)



Subject Code: 19MSE1PE07

M.Tech - I Semester Regular & Supple Examinations, May-2022
REPAIR AND REHABILITATION OF STRUCTURES
(SE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) What are the causes of deterioration of concrete? Explain in detail. [CO1,K1,6M]
(b) What is Quality Assurance in concrete construction? Discuss Quality Assurance of concrete construction? [CO1,K1,6M]
2. (a) Define permeability? Factors impacting permeability of concrete. [CO2,K1,6M]
(b) How do you prevent corrosion? Explain the methods of corrosion protection? [CO2,K2,6M]
3. (a) Write about design errors and construction errors? [CO3,K1,6M]
(b) Explain the defects due to climate, chemicals, wear and erosion? [CO3,K2,6M]
4. (a) write about Basic components of Structural Health Monitoring and its working mechanism. [CO3,K1,6M]
(b) Define structural Appraisal and explain with a case study? [CO4,K2,6M]
5. (a) Explain different methods of strengthening the concrete structures against earthquake. [CO4,K2,6M]
(b) what are the advanced techniques for making seismic resistant structures. [CO3,K1,6M]
6. (a) Explain about foamed concrete? What are methods are used for production of foamed concrete? [CO4,K2,6M]
(b) Define dry pack and Use of dry pack mortar for underpinning work. [CO3,K1,6M]
7. (a) What is Gunite? Explain with neat sketch. [CO1,K2,4M]
(b) What is shotcrete? What are the stages in dry mix process in shotcrete? [CO3,K1,5M]
(c) Explain briefly about epoxy injection process. [CO4,K2,3M]
8. (a) What is chemical disruption? [CO3,K1,4M]
(b) Explain weathering wear [CO3,K2,4M]
(c) write about different marine exposure environments [CO3,K1,4M]



Subject Code: 19MSE1PE10

M.Tech - I Semester Regular & Supple Examinations, May-2022
ADVANCED CONCRETE TECHNOLOGY

(SE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Explain the following in detail:- [CO1,K2,6M]
 - (i) Effect of Admixture
 - (ii) Chemical composition of cement(b) Explain hydrated structure of cement with neat sketch [CO1,K2,6M]
2. (a) Write the different ferro cement materials [CO1,K1,6M]
(b) Explain about cracking of ferro cement [CO1,K2,6M]
3. (a) What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of Concrete [CO2,K1,6M]
(b) . List and explain the various factors affecting the strength of concrete. [CO2,K1,6M]
4. (a) What is Mix Design? Explain in detail the various factors governing the selection of mix Proportion? [CO3,K2,6M]
(b) Discuss the step by step procedure for mix design of high performance concrete recommended by ACI committee [CO3,K2,6M]
5. (a) Explain different moduli of elasticity of concrete and explain their practical significance [CO4,K2,6M]
(b) Explain statistical quality control of concrete. Explain common terminology used in statistical evaluation of concrete. [CO4,K2,6M]
6. (a) Explain in detail about the Rebound Hammer Test (NDT) that is conducted on existing structure [CO4,K2,6M]
(b) Explain when do you go to NDT? [CO4,K2,6M]
7. Explain about [CO5,K2,12M]
 - a) Roller compacted concrete
 - (b) Self compacting concrete
8. What is FRC? Explain its applications in concrete structures and its advantages?

[CO5,K2,12M]



Subject Code: 19MDE1TH01

M.Tech - I Semester Regular & Supple Examinations, May-2022
DIGITAL SYSTEM DESIGN
(DE&CS)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Obtain the minimal expression using the tabular method and implement it in universal logic
 $F(A,B,C,D) = \sum m(0, 1, 3, 4, 5, 7, 8, 10, 13, 14, 15)$ [CO1,K4,6M]
(b) What is a K-map? What are its advantages and disadvantages? [CO1,K1,6M]
2. (a) Minimize the following switching function using CAMP Algorithm. [CO2,K3,6M]
 $f(a, b, c, d) = \sum m(1, 2, 3, 5, 7, 9, 10, 11, 13, 14, 15)$
(b) Explain the concept of different Cube based operations in CAMP Algorithm [CO2,K2,6M]
3. (a) Explain the PLA design for the following $f = x'y'z + x'yz + xyz + xy'z'$ [CO3,K2,6M]
(b) Compare ROM, PLA and PAL with respect to all features, programming aspects and applications. [CO3,K2,6M]
4. (a) what is SM chart? Explain the concept of Derivation of SM Charts with one example [CO3,K2,6M]
(b) Explain the following terms in detail [CO4,K2,6M]
(i) CPLDs (ii) FPGAs
5. (a) Draw the 3-bit parity checker circuit. Using the path-sensitization method, find the test vectors for SA0 and SA1 faults on each line of the circuit [CO5,K3,6M]
(b) A two level AND-OR circuit has four AND gates feeding one OR gate. The four AND gates realize the product terms $x_1x_3'x_4$, x_2x_4 , $x_1'x_3'x_4'$ and $x_1x_2x_3$ respectively. [CO5,K3,6M]
Derive the a-test and b - test for detecting multiple stuck-at faults
6. (a) List out the different properties of Boolean difference method in detail [CO5,K2,6M]
(b) Draw the circuit diagram of built-in-self-test and explain its operation in detail [CO5,K2,6M]
7. (a) Briefly discuss about fault diagnosis and testing with flow diagram [CO5,K2,6M]
(b) Explain the concept of adaptive distinguishing experiments in detail [CO5,K2,6M]
8. (a) Write short notes on following. [CO5,K2,12M]
(i) ROM Design (ii) Kohavi Algorithm (iii) DFT schemes



Subject Code: 19MEEC1TH02

M.Tech - I Semester Regular & Supple Examinations, May-2022
VLSI TECHNOLOGY AND DESIGN
(DECS & DSCE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. a) What is the essential use of state diagram and draw a state diagram for the half adder. [CO1,K1,6M]
b) Differentiate SoC and FGPA. Also explain how SoC different from microprocessor. [CO1,K3,6M]
2. a) Explain about the twin-tub process with neat diagrammatic representation. [CO2,K2,6M]
b) Describe these: I) Power Dissipation, II) Propagation Delay, III) Noise Margin [CO2,K3,6M]
3. a) Explain these: I) Testing, II) Fault Coverage, III) Clock Skew [CO3,K2,6M]
b) Compare all VLSI design technology options and select the best technology option for the low power trending. [CO3,K4,6M]
4. a) In the inverter circuit, what is meant by $Z_{P,U}$ and $Z_{P,D}$? Derive the required ratio between $Z_{P,U}$ and $Z_{P,D}$ if an nmos inverter is to be driven from another nmos inverter. [CO4,K1,6M]
b) What are the things to be considered in the basic circuit concepts in MOS devices? Explain Fan-In and Fan-out characteristics. [CO4,K1,6M]
5. a) Draw the stick diagram and symbolic diagrams of NMOS, CMOS and BiCMOS inverters. Select the best to use as an inverter. [CO5,K1,6M]
b) Design and illustrate the 4-bit shifter, also explain its application. [CO5,K2,6M]
6. a) Design a 4-bit comparator using multi – level logic. [CO5,K2,6M]
b) Briefly explain the floor planning and issues to be addressed while selection of chip area. [CO6,K2,6M]
7. a) Derive the scaling factor (k) for the channel resistance and analyze the result with unscaled technology values. [CO4,K2,6M]
b) What is called bus lane and provide the overview of the bus lane architecture in BICMOS circuits. [CO4,K1,6M]
8. a) Provide the ASIC design flowchart and explain each level in ASIC design flow. [CO1,K2,6M]
b) Describe the wafer fabrication process and also list diffusion types. [CO2,K2,6M]



Subject Code: 19MEC1TH03

M.Tech - I Semester Regular & Supple Examinations, May-2022

DIGITAL DATA COMMUNICATIONS

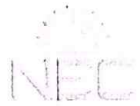
(DECS & DSCE)

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions.
All questions carry EQUAL marks**

1. a) Explain the working principle of 16-QAM system with the help of a neat diagram. [CO1,K2,8M]
b) A QAM type modulator converts groups of 6 bits into symbols. What are the values of symbol rate and number of different symbols, if the data rate is 12000 bps.[CO1,K3,4M]
2. a) With the help of a neat diagram, explain the DTE-DCE interface. [CO2,K2,7M]
b) Explain the various network topologies and compare the performance of each topology. [CO2,K2,5M]
3. a) List out types of Errors. Explain VRC and CRC. [CO3,K2,6M]
b) Determine the number of Hamming bits required for a 12-bit data string of 101100010010 and generate the hamming codeword. [CO3,K3,6M]
4. a) What are the tasks of FDDI media access control protocol? Explain. [CO4,K2,6M]
b) Differentiate the circuit switching and packet switching. [CO4,K2,6M]
5. a) Explain the principle of TDMA and derive the expression for efficiency of TDMA. [CO5,K2,6M]
b) Explain IEEE802.6 standard. [CO5,K2,6M]
6. a) Define Polling, Token passing, and reservation. [CO4,K1,6M]
b) Distinguish CSMA and CSM/CA with all details. [CO5,K2,6M]
7. Compare TCP/IP protocol with OSI model. [CO2,K2,12M]
8. Explain the Link Access Procedures. [CO4,K2,12M]



Subject Code: 19MDE1TH08

M.Tech - I Semester Regular & Supple Examinations, May 2022

EMBEDDED REAL TIME OPERATING SYSTEMS

(DE&CS)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Discuss in detail about the Kernel Architecture. (CO1,K2,6M)
(b) Describe the steps involved in the Timer functions. (CO1,K2,6M)
2. (a) Analyze various states of Task. (CO2,K2,6M)
(b) Explain about the interrupt handling structure in Real Time Systems. (CO2,K2,6M)
3. Explain in detail about various real time Task Scheduling Algorithms. (CO2,K2,12M)
4. (a) Explain the basic feature of Vx-Works and discuss about the scheduling algorithms supported by Vx-Works. (CO3,K2,6M)
(b) Differentiate Windows CE. NET from Windows CE. (CO3,K2,6M)
5. (a) Explain about Adaptive Cruise Control (ACC) System in Car, with necessary diagrams. (CO4,K2,6M)
(b) How application specific controllers are designed? Explain with example of digital camera. (CO4,K2,6M)
6. (a) Explain about inter-process communication. (CO5,K2,6M)
 - i) Mailbox
 - ii) Pipes
(b) Give the details of shell variables. (CO5,K1,6M)
7. (a) Differentiate semaphore and Mutex. Also state the applications of semaphores in data communication. (CO5,K2,6M)
(b) Explain about the Filters with some basic commands.(CO5,K2,6M)
8. (a) Write the program to display a message periodically. (CO6,K1,6M)
(b) Discuss in detail about mutex management in RT Linux environment. (CO6,K2,6M)



Subject Code: 19MDE1TH09

M.Tech - I Semester Regular & Supple. Examinations, May 2022
OPTICAL COMMUNICATION TECHNOLOGY
(DE&CS)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Derive a step-index multimode glass fibre has a core diameter of $50 \mu\text{m}$ and cladding refractive index of 1.45. If it is to have a limiting intermodal dispersion δT of 10 ns / km , find its acceptance angle. Also calculate the maximum bit rate for transmission over a distance of 20 km. [CO1, K3, 6M]
(b) Illustrate the pulse broadening effect of chromatic dispersion on unchirped and chirped Gaussian pulses. [CO2, K2, 6M]
2. (a) Differentiate self phase modulation and four wave mixing. [CO2, K2, 6M]
(b) Consider a chirped Gaussian pulse for which the product $k\beta_2$ is negative that is launched at $z=0$. Let $k=5$. For what value of z does the launched pulse attain its minimum width? [CO2, K3, 6M]
3. (a) Construct $n \times n$ star coupler with 3 dB couplers. [CO2, K3, 6M]
(b) Derive the power transfer function of Fabry Perot filter. [CO2, K3, 6M]
4. (a) Design an AWG that can multiplex/demultiplex 16 WDM signals spaced 100 GHz apart in the $1.55 \mu\text{m}$ band. [CO1, K3, 6M]
(b) Realize 4×4 cross bar switch using 2×2 switches. [CO1, K3, 6M]
5. (a) Discuss the applications of subcarrier multiplexing. [CO4, K2, 6M]
(b) Consider the optical duobinary modulation scheme. If the data sequence $d(nT) = 1010101101011100001$, calculate [CO4, K3, 6M]
i) the differential encoding $x(nT)$ of $d(nT)$
ii) the duobinary encoding $y(nT)$ of $x(nT)$.
6. (a) Show that the BER for an OOK direct detection receiver is given by $BER=Q$ [CO5, K2, 6M]
(b) Analyse the interleaving mechanism in Reed-Solomon Codes. [C52, K4, 6M]
7. (a) Explain about various components of WDM systems. [CO6, K2, 6M]
(b) Discuss about various cross talk reduction techniques. [CO2, K3, 6M]
8. (a) Explain the overall design considerations of an optical communication system. [CO1, K2, 6M]
(b) Describe the All-optical networks. [CO6, K2, 6M]



Subject Code: 19MEC1TH06

M.Tech - I Semester Regular & Supple Examinations, May-2022

WIRELESS COMMUNICATION AND NETWORKS

(DECS & DSCE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. a) What is hand off process? Explain the hand-off mechanism. [CO1,K2,6M]
b) Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q = \sqrt{3N}$, where $N=i^2 +ij+j^2$. [CO1,K3,6M]
2. a) Explain about Ground reflection model [CO2,K2,6M]
b) Write about Knife-Edge diffraction geometry with suitable diagrams? [CO2,K2,6M]
3. a) What do you mean by path loss model? Explain in detail about log-distance path loss model. [CO3,K2,8M]
b) Explain about Indoor propagation losses [CO3,K2,4M]
4. a) An aircraft is heading towards a control tower with 500kmph, at an elevation of 20° . Communication between aircraft and control towers occurs at 900MHz. Find out the expected Doppler shift. [CO4,K3, 4M]
b) What are the factors that influence small scale fading? Write in short. [CO4,K1,8M]
5. a) Explain about the simulation of Clarke and Gans fading model. [CO4,K2, 6M]
b) Define spatial diversity [CO5,K1, 2M]
c) Discuss about scattering propagation mechanism. [CO2,K2, 4M]
6. Describe in detail about [CO5,K2,12]
 - i. Linear Equalizer
 - ii. Non linear equalizer
7. a) What are the advantages and disadvantages of WLAN [CO6,K1, 6M]
b) Explain about HiperLAN protocol. [CO6,K2, 6M]
8. Write short notes on the following
 - a) Adjacent channel interference [CO1,K2,4M]
 - b) frequency selective fading. [CO3,K2,4M]
 - c) Maximum Likelihood Sequence Estimation (MLSE) Equalizer [CO5,K2,4M]



Subject Code: 19MCS1TH01

M.Tech - I Semester Regular & Supple Examinations, May-2022
ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

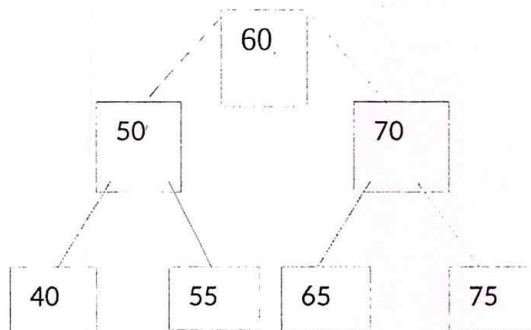
1. (a) Write an algorithm for basic operations of Stack. [K1,CO1,6M]
(b) Write an algorithm to delete an element anywhere from doubly linked list. [K1,CO1,6M]

2. (a) Sort the following elements using insertion sort : [K3,CO2,6M]
4,2,8,11,16,34,65,23,89,76,88
(b) Explain about different graph storage structures with examples. [K2,CO2,6M]

3. (a) What is Hashing? Explain briefly different Hash functions. [K2,CO3,6M]
(b) Explain about open hashing and closed hashing methods. [K2,CO3,6M]

4. (a) What is a priority queue ADT? Explain the insertion and deletion operations on a priority queue with an example. [K2,CO4,6M]
(b) Explain briefly about the heap representation of priority queue. [K2,CO4,6M]

5. a) Write an algorithm for finding maximum element of the Binary Search Tree and height of the tree [K2,CO5,6M]



- b) Write in-order, pre-order and post-order traversal algorithms and traceout the algorithms for the above Binary Search Tree [K2,CO5,6M]

6. (a) Construct an AVL Tree for the following list elements: [K3,CO4,6M]
20, 30,80,40,10,60,50,70
(b) Explain how merging and splitting operations is done on a Splay Tree. [K2,CO5,6M]

7. (a) Define Dictionary. Discuss the operations that can be performed on dictionary. [K2,CO5,6M]
(b) Compare various Search Trees with their properties and limitations. [K2,CO5,6M]

8. (a) Construct a B-tree of order 3 for the following data: [K2,CO4,6M]
50, 30, 21, 90, 10, 13, 20, 70, 25, 92, 80
(b) What is hashing with Chains? Explain how it differs with Linear Probing. [K2,CO3,6M]



Subject Code: 19MCS1TH02

M.Tech - I Semester Regular & Supple Examinations May - 2022
COMPUTER ORGANIZATION AND OPERATING SYSTEMS
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

-
1. (a) Explain Block diagram of Micro computer. [CO1,K2,4M]
(b) Explain Arithmetic Micro operations. [CO1,K2,8M]
 2. (a) Discuss various instruction formats. [CO1,K2,6M]
(b) Discuss addressing modes [CO1,K2,6M]
 3. (a) What are the operating system services and functions? [CO4,K1,6M]
(b) Explain process state diagram. [CO4,K2,6M]
 4. (a) What are the necessary and sufficient conditions for occurrence of deadlocks [CO5,K1,6M]
(b) Briefly explain dead lock prevention mechanism. [CO5,K2,6M]
 5. (a) Explain any two page replacement algorithms. [CO6,K2,6M]
(b) Explain simple paging. [CO6,K2,6M]
 6. (a) Explain disk scheduling algorithms. [CO6,K2,6M]
(b) Discuss any two CPU scheduling algorithms. [CO4,K2,6M]
 7. (a) Discuss arithmetic instructions. [CO2,K2,6M]
(b) What are the CISC characteristics? [CO2,K1,6M]
 8. Discuss any two of the following. 2X6=12M
 - a. Register Transfer Logic [CO2,K2,6M]
 - b. Virtual Memory [CO6,K2,6M]
 - c. DMA[CO6,K2,6M]

Subject Code: 19MCS1TH03

M.Tech - I Semester Regular & Supple Examinations, May-2022

DATABASE MANAGEMENT SYSTEMS

(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.

All questions carry EQUAL marks

-
- 1 a) List the disadvantages of the File System. [CO1,K1,6M]
b) What is a data model? Explain the types of data models used [CO1,K2,6M]
- 2 a) Define Entity, Attribute? What is aggregation in an ER model? [CO1,K1,6M]
b) Develop an ER diagram using aggregation that captures the following information : Employees work for projects. An employee working for a particular project uses various machinery. A unnecessary attributes. State any options you make. Also discuss about the ER diagram you have designed. [CO2,K3,6M]
- 3 a) Illustrate the following clauses with example
i)From ii)having iii)order by iv) group by [CO3,K2,6M]
b) How data is represented in relational model and what are the operations that are allowed on relational model database. [CO1,K1,6M]
- 4 a) Illustrate correlated nested queries, aggregate operators with suitable examples? [CO3,K2,6M]
b) Differentiate aggregation and Inheritance and give examples [CO3,K2,6M]
- 5 a) Analyse third Normal Forms and BCNF with suitable example. [CO2,K4,6M]
b) Define Join dependency and 5NF. How you can prove decomposition of database is lossless [CO2,K1,6M]
- 6 a) Analyse how 2 phase locking ensure the serializability [CO4,K4,6M]
b) Explain Time stamp-Based Concurrency Control protocol and the modifications implemented in it. [CO4,K2,6M]
- 7 a) What are the rules followed when shared/exclusive locking scheme is used?. [CO4,K1,6M]
b) Explain about Properties of Decompositions. [CO4,K2,6M]
- 8) Define cluster and multi level indexing ? Create dynamic multi-level indexing using B+trees for the following data. 1,2,5,6,8,10,18,27,32,41,45,52,58,73,80,91,99 with D=2 [CO5,K1,6M]

Subject Code: 19MCS1TH04

M.Tech - I Semester Regular & Supple. Examinations, May 2022
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

- Show that $q \vee (p \wedge \sim q) \vee (\sim p \wedge \sim q)$ is a Tautology. [CO1, K3, 6M]
 - Give the Dual of each Statement I) $(A \wedge B) \vee C = (B \vee C) \wedge (A \vee C)$
II) $(A \wedge B) \vee C = A \wedge (B \vee C)$ [CO1, K3, 3+3M]
- Prove the logical equivalence $\exists x, [p(x) \rightarrow q(x)] \Leftrightarrow \forall x, p(x) \rightarrow \exists x, q(x)$ [CO1, K3, 6M]
 - Show that $\forall x(P(x) \vee Q(x)) \rightarrow \forall x P(x) \vee \exists x Q(x)$, using the indirect method. [CO1, K3, 6M]
- If R is a Relation from $A = \{1,2,3\}$ to $B = \{1,2\}$ such that aRb , if $a > b$, write down the matrix representation of R. [CO2, K3, 6M]
 - Show that the factorial function $f(x) = x!$ is primitive function. [CO2, K3, 6M]
- Identify an Eulerian path in the graph (Figure 2). [CO3, K3, 6M]
 - Determine whether the directed graphs shown in Figure 3 are isomorphic? [CO3, K5, 6M]

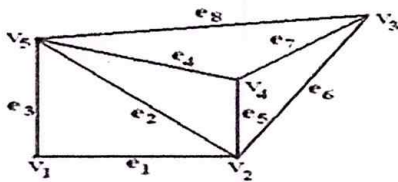


Figure 2

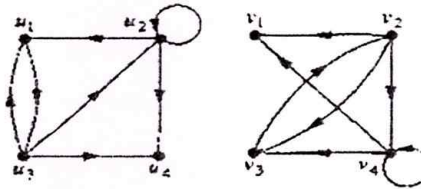


Figure 3.

- Show that the lattice of Divisors of any Positive Integer n, Viz., $\{S_n, D\}$ is a sublattice of $\{Z^+, D\}$. [CO3, K3, 12M]
- Prove the Pigeonhole Principle theorem. [CO3, K3, 6M]
 - A Computer Password consists of a letter of the English alphabet followed by 3 or 4 digits. Find the number of passwords 1) That can be formed 2) in which no digit repeats. [CO3, K3, 6M]
- Solve the Recurrence relation $u_n = 3u_{n-1}, n \geq 1$ using generating function. [CO4, K3, 6M]
 - Solve the Recurrence relation $u_n + 5u_{n-1} + 6u_{n-2} = 3n^2 - 2n + 1$ [CO4, K3, 6M]
- Using fundamental theorem of Graphs find the number of edges, if the sum of degrees of the all the vertices in graph G is 24. [CO3, K3, 6M]
 - Construct the binary tree of the Algebraic expression: $((A \times B) + (C - (D \times E))) + (F - (G \times H))$ [CO3, K3, 6M]



Subject Code: 19MCS1TH05

M.Tech - I Semester Regular & Supple Examinations, May-2022

COMPUTER NETWORKS

(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.

All questions carry EQUAL marks

-
1. (a) Explain OSI reference model. [CO1,K2,8M]
(b) Compare TCP/IP reference model with OSI reference model [CO1,K3,4M]
 2. (a) Discuss Data Link Layer design issues [CO2,K2,6M]
(b) Discuss Error detection and Error correction [CO2,K2,6M]
 3. (a) Explain Go Back N protocol [CO3,K2,6M]
(b) Explain CSMA/CD protocol [CO3,K3,6M]
 4. (a) Compare connection oriented and connection less protocols. [CO4,K3,4M]
(b) Illustrate Distance Vector Routing algorithm [CO4,K4,8M]
 5. (a) Discuss various transport service primitives [CO5,K2,8M]
(b) Compare TCP and UDP protocols [CO5,K3,4M]
 6. (a) Explain SMTP protocol [CO6,K2,6M]
(b) What is DNS ? Explain DNS name space. [CO6,K2,6M]
 7. (a) Explain Network topologies [CO3,K2,6M]
(b) Explain simplex stop and wait protocol [CO3,K2,6M]
 8. Explain any two of the following
 - a. LAN, MAN and WAN [CO1,K2,6M]
 - b. ALOHA [CO3,K2,6M]
 - c. Berkely Sockets [CO4,K2,6M]



Subject Code: 19MCS1TH06

M.Tech - I Semester Regular & Supple Examinations, May-2022

ADVANCED SOFTWARE ENGINEERING

(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Explain the software development process models. [CO1,K2,6M]
(b) Discuss in-detail about software engineering challenges. [CO1,K2,6M]
2. (a) Explain the Role of SRS in a Project and the value a good SRS brings to it. [CO2,K2,6M]
(b) Explain the different activities in the process for producing the desired SRS. [CO2,K2,6M]
3. (a) Discuss in-detail about the software design principles. [CO3,K2,6M]
(b) Explain the characteristics of good software design. [CO3,K2,6M]
4. (a) Explain in-detail about Requirements Validation. [CO2,K2,6M]
(b) Write in-detail about Structured Design Methodology. [CO3,K1,6M]
5. (a) Write about the coding process in-detail. [CO3,K1,6M]
(b) Discuss briefly about black box testing and white box testing. [CO4,K2,6M]
6. (a) Explain project management essentials in-detail. [CO4,K2,6M]
(b) Write in-detail about software metrics and measurements. [CO4,K1,6M]
7. (a) Discuss in-detail about levels of testing. [CO4,K2,6M]
(b) Write about effort estimation techniques. [CO4,K1,6M]
8. (a) Explain in-detail about Capability maturity model. [CO4,K2,6M]
(b) Discuss about software maintenance in-detail. [CO4,K2,6M]
