

16MTE1003**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech I Semester Regular & Supplementary Examinations, February-2018****ADVANCED HEAT AND MASS TRANSFER****(Thermal Engineering)****Time: 3 hours****Max.Marks:60****Answer any FIVE questions****All questions carry equal marks**

1. a) Explain briefly on different modes of heat transfer with examples. [6M]
b) Explain and construct the lumped system and steady state heat transfer. [6M]
2. Explain the finite difference methods for heat conduction with neat figures. [12M]
3. a) Predict the momentum equation for the laminar boundary layer on a flat plate. State the assumptions made. [8M]
b) Describe the velocity and temperature profiles. [4M]
4. a) Explain the different types of dimensionless variables and predict the operating line equation for forced convection. [6M]
b) A mixture of He and N₂ gas is contained in a pipe at 2980K and 1 atm total pressure which is constant throughout. At one end of the pipe at point 1 the partial pressure of He is 0.60atm and at the other end 0.2m, pressure is 0.20atm.calculate the mass diffusive flux of He at steady state if diffusivity of He-N₂ mixture is $0.687 \times 10^{-4} \text{ m}^2/\text{sec}$. [6M]
5. a) Explain with diagrams of boiling curve. [5M]
b) Ammonia at 40°C is condensing inside a horizontal tube of 16mm ID. Mass velocity of ammonia vapour at inlet is 20 kg/m² s. Surface of the tube is maintained at a constant temperature of 20°C by circulating cold water. Calculate the fraction of vapour that will condense if the tube is 0.5m long. Use the following data properties of liquids at T_f=30°C: $\rho_L=596.4 \text{ kg/m}^3$, $C_{pl}=4890 \text{ J/kg } ^\circ\text{C}$, $\mu_L=2.081 \times 10^{-5} \text{ kg/m sec}$, $K_L=0.507 \text{ W/m}^\circ\text{C}$ and $g=9.81 \text{ m/s}^2$. Properties of saturated vapor at 40°C: $h_{fg}=1098.8 \times 10^3 \text{ J/kg}$, $\rho_v=12.029 \text{ kg/m}^3$ and $\mu_v=1.0735 \times 10^{-5} \text{ kg/m s}$. [7M]
6. a) Explain the mass transfer with examples. [4M]
b) Explain the diffusion and convective mass transfer. [4M]
c) Describe the analogy between momentum and heat transfer. [4M]
7. Explain the following terms
a) absorbing media. [3M]
b) Gas radiation. [3M]
c) Specular surface. [3M]
d) non-grey bodies. [3M]
8. a) Predict the operating line equation for heat transfer through a plane slab. [6M]
b) Explain briefly on transient heat conduction in semi-infinite solids. [6M]

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SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech I Semester Supplementary Examinations, February-2018

**DIGITAL DATA COMMUNICATIONS
Digital Electronics and Communication Systems**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Explain about QPSK & QAM 8M
(b) Write a short note about LCU 4M
2. (a) Define the following 6M
 - i) Serial configuration
 - ii) Parallel configuration
 - iii) Transmission modes
- (b) Explain about ISDN 6M
3. (a) Explain about Super frame TDM format 6M
(b) Explain about T carrier systems 6M
4. (a) Explain about European Time division multiplexing 6M
(b) Explain about FDM in detail 6M
5. (a) Explain about the Error detection techniques 6M
(b) Encode the following message sequence 101100011001 with the help of hamming bits 6M
6. (a) Differentiate Traditional, Fast, Giga bit Ethernet 6M
(b) Explain the frame format for IEEE 802.11 6M
7. (a) Explain Piconet & Scatternet in Bluetooth 6M
(b) Write a short note on audio compression techniques 6M
8. (a) Explain about FSK in detail 6M
(b) Define the following terms 6M
 - i) Bit Error rate
 - ii) Baud rate
 - iii) Parity bit

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SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech I Semester Regular & Supplementary Examinations, February-2018

POWER ELECTRONICS CONTROL OF DC DRIVES

(Power Electronics and Drives)

Time: 3 Hours

Max Marks: 60

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

1. (a) Deduce the state space model of a separately excited DC motor from fundamentals? [6M]
(b) A separately-excited dc motor with parameters: $R_a=0.5\Omega$, $L_a=0.003H$, and $K_b=0.8V/rad/sec$, is driving a load of $J=0.0167kg\cdot m^2$, $B_l=0.01 Nm/rad/sec$ with a load torque of $100N\cdot m$ is started directly from a $220V$ DC supply with no load. Find its starting speed response and the time taken to reach $100rad/sec$. [6M]
2. (a) Explain the operation of a single phase full converter fed to a separately excited DC motor for discontinues mode of operation and hence derive the expression for average output voltage ? [6M]
(b) Explain about principle of DC motor speed control? [6M]
3. (a) Explain the operation of a three phase full converter when connected to a separately excited DC motor for discontinuous mode of operation. [6M]
(b) Draw the converter configuration for a four quadrant DC drive and explain its operation with neat graphs. [6M]
4. Derive the expressions for the transfer functions of various subsystems of a DC drive. [12M]
5. Explain two quadrant Three Phase Converter controlled DC Motor Drive [12M]
6. (a) Explain the steady state analysis of a chopper controlled DC motor drive for continuous current conduction? [6M]
(b) Explain how the ratings of different devices of a chopper circuit are determined? [6M]
7. (a) Explain how boost operation can be attained by chopper controlled DC drive? [6M]
(b) Explain how chopper can be operated for inversion? [6M]
8. (a) Draw the speed controlled DC motor drive block diagram and explain the operation of hysteresis current controller? [6M]
(b) Explain about the design of current controllers ? [6M]

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SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
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I M.Tech I Semester Regular & Supplementary Examinations, February-2018

ANALOG IC DESIGN (VLSI System Design)

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Suggest any two gain boosting topologies in opamp and explain 6M
(b) Describe the operation of two-stage CMOS opamp using nulling resistor compensation with necessary equations 6M
2. (a) Explain the operation of BJT and MOSFET current mirror circuits 8M
(b) Briefly explain about noise models of a) BJT and b) MOS transistor 4M
3. (a) Analyze the source follower 7M
(b) What is a comparator? Explain in detail about Latched comparators 5M
4. (a) Draw the block diagram of PLL & explain 7M
(b) What is the significance of VCO in PLL circuits 5M
5. (a) What is a switched capacitor circuit? List the important features of it 6M
(b) Discuss about peak detector using switched capacitor circuit 6M
6. (a) With neat sketch explain the 4-bit Folded resistor string D/A converters 6M
(b) Explain the principle of operation of an Integrating type A/D converters 6M
7. (a) Briefly explain need of compensating networks in opamps 6M
(b) What is the use of cascading in the second stage of CMOS opamp 6M
8. (a) Brief out the performance characteristics of A/D converters 8M
(b) What are the major differences between digital and analog PLL's? 4M

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CODE: 16MCS1003 **SET-2**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Regular & Supplementary Examinations, February-2018

COMPUTER NETWORKS **Computer Science and Engineering**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

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|--------|--|----|
| 1. (a) | With a neat diagram explain all the layers of OSI model | 6M |
| (b) | Write about classification of networks based on network hardware | 6M |
| 2. (a) | Write in detail about ISDN services, architecture and types of ISDN. | 8M |
| (b) | What are the services offered by Data Link Layer | 4M |
| 3. (a) | Explain in detail the SLIP and point-to-point protocols in DLL | 6M |
| (b) | What is ALOHA? Explain the types of ALOHA | 6M |
| 4. (a) | Write about circuit switching and packet switching | 7M |
| (b) | Explain Selective repeat protocol | 5M |
| 5. (a) | Explain clearly with an example link state routing algorithm | 6M |
| (b) | Compare Virtual circuits and Datagram Subnets | 6M |
| 6. (a) | Explain in detail about hierarchical routing | 6M |
| (b) | Explain the quality of service parameters of transport layer | 6M |
| 7. (a) | Explain the TCP congestion protocol | 6M |
| (b) | Explain the leaky bucket algorithm | 6M |
| 8. (a) | Explain about DNS in detail | 7M |
| (b) | Write a web page in HTML | 5M |

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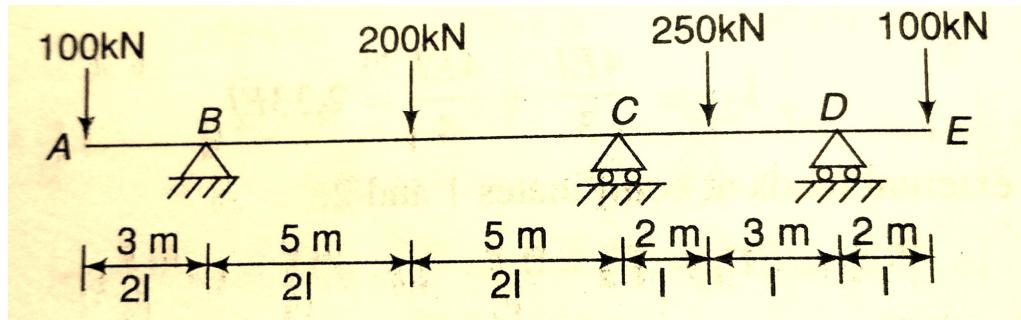
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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

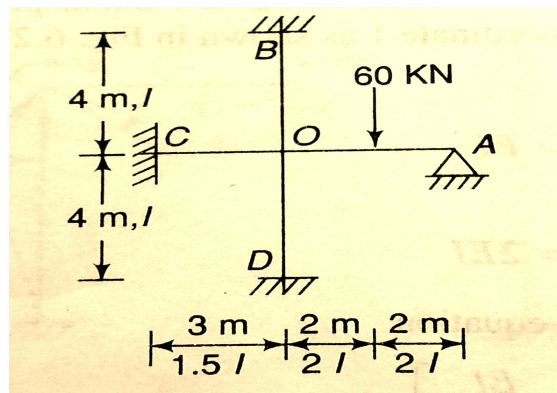
I M.Tech I Semester Regular & Supplementary Examinations, February-2018

MATRIX ANALYSIS OF STRUCTURES (Structural Engineering)

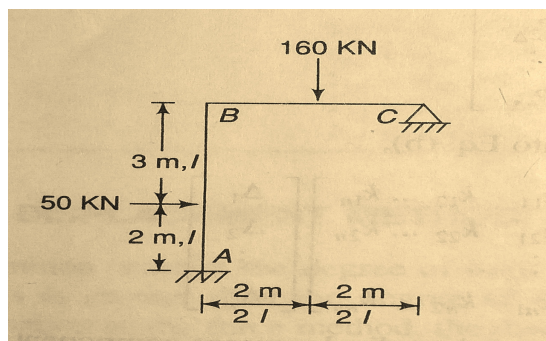
1. (a) Define degree of redundancy and degree of freedom with two examples each 5M
(b) Differentiate between flexibility method and stiffness method. 7M
2. Analyse the three span continuous beam shown in fig by stiffness method. 12M



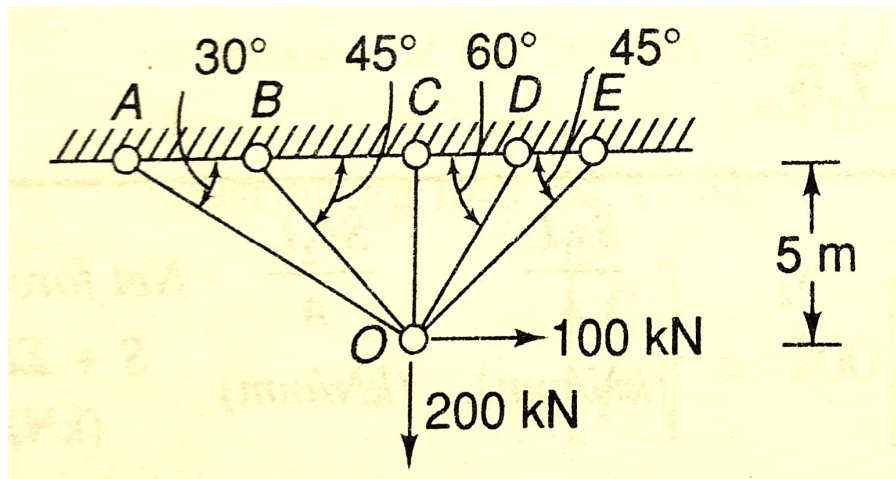
3. Analyse the frame shown in fig by stiffness method. 12M



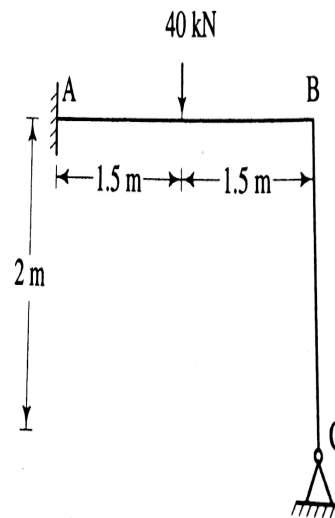
4. Analyse and draw B.M.D for portal frame as shown in fig by using stiffness method. EI is constant. 12M



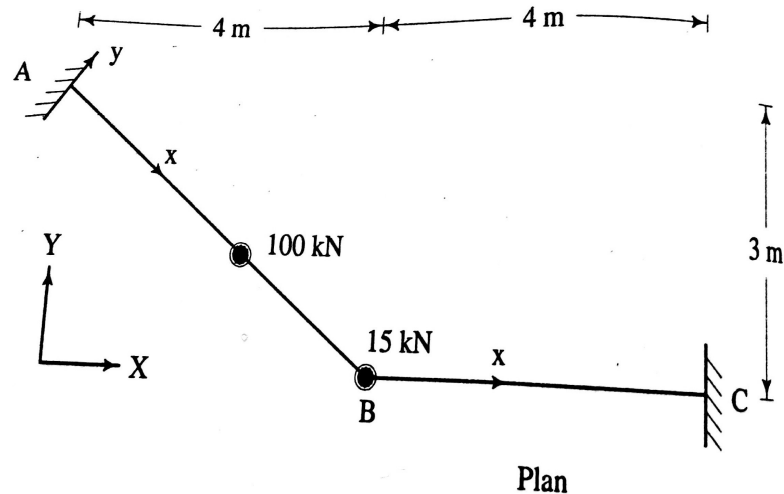
5. Analyse a truss shown in fig using stiffness method. 12M



6. Analyse the frame by using flexibility method. 12M



7. Fig shows a grid lying in horizontal XY plane. It has two members. Joint A and C are clamped. Beam AB supports a point load of 100 kN at 3 m from A and beam BC supports distributed load of 72 kN/m. A load of 15 kN acts on joint B in vertically downward direction. Calculate total joint load on B. 12M



8. Explain in detail about approximate analysis of shear walls 12M