

Code No: I2203/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

TRAFFIC ENGINEERING

Transportation Engineering (22)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | |
|------|--|-----|
| 1. a | Explain the relationship among the traffic parameters speed, flow and density with the help of diagrams. | 6M |
| b | What are the objectives of speed studies? | 6M |
| 2. a | Define spot speed, time mean speed and space mean speed . | 6M |
| b | Discuss about gap acceptance studies. | 6M |
| 3. a | Define Capacity. What is the importance of capacity in Highway Transportation studies | 6M |
| b | Discuss the concept of level of service in the HCM manual. | 6M |
| 4. a | What are the common methods of On-street parking? | 6M |
| b | Give the procedure for Parking usage survey by Patrolling method | 6M |
| 5. a | What are the various causes of road accidents? | 6M |
| b | What are the 3-E measures to reduce accidents? | 6M |
| 6. a | Write the advantages and disadvantages of traffic signals | 6M |
| b | Explain various Signal Co-ordination methods. | 6M |
| 7. a | Explain how the noise is generated by road traffic? | 6M |
| b | What is Air pollution? What are the effects of pollutants due to road traffic on the environment? | 6M |
| 8. | Write short notes on the following. | 12M |
| | i. parking index | |
| | ii. headways | |
| | iii. cordon survey | |
| | iv. time mean speed | |



Code No: I5604/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

REACTIVE POWER COMPENSATION & MANAGEMENT

Common to Power Systems(56),PSC &A(53),PSE(30),PS & C(31),ADV
PS(50),EPE(60),EPS(65) and Power Electronics & Power Systems (99)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | | |
|----|---|--|-----|
| 1. | a | Discuss how a Load Compensator works as a voltage regulator | 6M |
| | b | Explain the approximate reactive power characteristics. | 6M |
| 2. | | Explain in detail of transient state reactive power compensation in transmission system by using shunt and series compensation | 12M |
| 3. | a | Describe the effect of harmonics and radio frequency on reactive power compensation | 8M |
| | b | Explain the need of reactive power management. | 4M |
| 4. | a | Explain the effects of Reactive Power in Various elements of Power System | 6M |
| | b | Discuss in detail of the various methods for loss reduction | 6M |
| 5. | a | What are the functions of using capacitors as compensators | 4M |
| | b | Briefly discuss how to select a capacitor for user side reactive power management | 8M |
| 6. | a | Discuss the load trends in demand side management. | 4M |
| | b | Explain Reconfiguration methods and Optimizing power flows method used for reduction of losses in power systems. | 8M |
| 7. | a | Explain briefly surge impedance and natural loading of an uncompensated transmission line. | 6M |
| | b | Explain the filter requirements for reactive power management in electric traction systems and furnaces. | 6M |
| 8. | a | Explain how shunt compensation is obtained by means of Mid-point shunt reactor or capacitor in transmission lines | 6M |
| | b | What are the different load patterns available and also explain the basic methods of load shaping? | 6M |

1 of 1



Code No: I5802/R16

M. Tech. I Semester Regular/Supple Examinations, JAN/FEB-2018

COMPUTER ORGANIZATION AND ARCHITECTURE

Computer Science & Engineering (58)

Time: 3 Hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

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|------|--|----|
| 1. a | Discuss about the error detection using parity bit code with examples | 8M |
| b | Find 2's complement of the following | 4M |
| | i) 10010 ii) 111000 iii) 0101010 iv) 111111 | |
| 2. a | What is RTL? Explain with suitable examples? What is its significance Instructions? | 7M |
| b | Discuss the use of following Registers | 5M |
| | i. MAR | |
| | ii. MDR | |
| | iii. IR | |
| | iv. PC | |
| | v. AC | |
| 3. a | Discuss about parallel priority interrupt | 6M |
| b | Draw the circuit of a BCD adder / subtractor and explain its operations | 6M |
| 4. a | Explain Division algorithm with example. | 6M |
| b | Compare and contrast between Asynchronous DRAM and Synchronous DRAM | 6M |
| 5. a | Explain the characteristics of multiprocessors, Encoders & Decoders | 6M |
| b | With an example explain how BCD addition is performed | 6M |
| 6. a | What is an Interrupt? Explain about different types of Interrupts. | 6M |
| b | Explain I/O Processor with a neat diagram | 6M |
| 7. a | Perform the arithmetic operations $35 + 40$ and $- 35 + (- 40)$ with binary numbers in signed 2's complement representation and signed- magnitude representation | 6M |
| b | Explain the operation of DMA controller with a neat diagram. | 6M |
| 8. a | Explain how to access I/O devices in a system | 6M |
| b | Multiple $(-7)_{10}$ with $(3)_{10}$ by using Booth's multiplication. Give the flow table of the multiplication | 6M |



Code No: I6805/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

EMBEDDED C

**Common to VLSI&ES (68)/ES&VLSI (48)/VLSID &ES (77)/ES &VLSID (81)
Embedded Systems (55)**

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | | |
|----|---|--|----|
| 1. | a | Draw the pin diagram of Atmel 8051 microcontroller and explain the function of each pin in detail | 6M |
| | b | List out the Futures of embedded C along with its applications | 6M |
| 2. | a | Draw the on-chip memory RAM organization of 8051 microcontroller and explain its operation | 6M |
| | b | Explain the different terms in power consumption of 8051 microcontroller
(i)Normal mode (ii)Ideal mode (iii)Power down mode | 6M |
| 3. | a | Write an embedded code for Reading and writing bits from port 1 to port 2 along with flowchart and algorithm | 6M |
| | b | What is Pull-up resistor? Explain the importance of Pull-up resistor concept in microcontroller | 6M |
| 4. | a | What is Switch De-bounce? Explain the concept of Dealing with Switch bounce with one example | 6M |
| | b | Explain the comparison of simple and generic version of reading switches of a microcontroller in detail | 6M |
| 5. | a | Draw the schematic representation of Port Header and explain its operation along with C code | 6M |
| | b | Write an Restructuring Code for Goat counting and explain its operation | 6M |
| 6. | a | Draw the high-level schematic view of a simple autopilot system and explain its operation | 6M |
| | b | Draw and Explain the following special function registers in detail
(i)TCON (ii)TMOD | 6M |
| 7. | a | What is delay? Explain the procedure for creating a portable hardware delay along with embedded C code | 6M |
| | b | Write short notes on need for Timeout mechanisms in detail | 6M |
| 8. | a | Draw the architecture of main control panel for the alarm system and explain its operation | 6M |
| | b | Explain the different states in software architecture of intruder alarm system in detail | 6M |



Code No: I6806/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

CMOS DIGITAL IC DESIGN

Common to VLSI&ES (68)/ES&VLSI (48)/VLSID &ES (77)/ES &VLSID (81)
VLSI (57)/VLSID (72)/VLSI System Design (61)/VLSI & Micro Electronics (76)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

1. Discuss about channel length modulation and subthreshold current. 12M
2. Design and describe CMOS full adder circuit. 12M
3. Realize latch using CMOS and discuss. 12M
4. Realize and discuss about transmission gate full adder. 12M
5. Discuss (i) clock feed through (ii) leakage currents in pseudo –NMOS circuit. (6+6)M
6. Discuss (i) differential NORA logic (ii) Differential DOMINO logic. (6+6)M
7. a Derive the power dissipation of a CMOS gate. (6+6)M
b Derive the average rise and fall times of a CMOS inverter.
8. Design a dynamic cross coupled sense amplifier. 12M

1 of 1



Code No: I8701/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018
THEORY OF ELASTICITY
(Common to Structural Engineering (87), Structural Design (85)
and Computer Aided Structural Engineering (35)

Time: 3 Hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

1. Show that the line elements at the point x, y that have the maximum and minimum rotation are those in the two perpendicular directions θ determined by
$$\tan 2\theta = \frac{\partial v / \partial y - \partial u / \partial x}{\partial v / \partial x + \partial u / \partial y}$$
 12
2. a Derive expressions for compatibility for a two dimensional problems. 6
b Derive expressions for strain at a point in terms of stress components. 6
3. Show that $\phi = -\frac{F}{d} 3xy^2(3d - 2y)$ 12
Applied to the region included in $y = 0, y = d, x = 0$, on the side x positive.
4. a Explain Saint-Venant's principle. 4
b Determine the stress components and sketch their variation in a region included in $Z=0, Z=d, x=0$ on the side x positive for the problem if plane stress satisfied by the stress function 8
$$\phi = -\frac{3F}{4d} \left[xz - \frac{xz^3}{3d^2} \right] + \frac{pz^2}{2}$$
5. Derive general equations in polar coordinates. 12
6. Show that 12
 $\epsilon_x = k(x^2 + y^2), \quad \epsilon_y = k(y^2 + z^2), \quad \gamma_{xy} = k'xyz, \quad \epsilon_z = \gamma_{xz} = \gamma_{yz} = 0$
Where k, k' are small constants, is not a possible state of strain.
7. The stresses in a rotating disk (of unit thickness) can be regarded as due to centrifugal force as body force in a stationary disk. Show that this body force is derivable from the potential $v = -1/2 p \omega^2(x^2 + y^2)$, where p is the density and ω the angular velocity of rotation (about the origin) 12
8. Write short notes on following
i Homogenous deformations. 4
ii Stress invariants. 4
iii Reciprocal theorem 4



Code No: G2203/R13

M. Tech. I Semester Supplementary Examinations, Jan/Feb-2018

TRAFFIC ENGINEERING

Common to Transportation Engineering (22), Highway Engineering(23)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | |
|------|--|-----|
| 1. a | Explain the relationship among the traffic parameters speed, flow and density with the help of diagrams. | 6M |
| b | What are the objectives of speed studies? | 6M |
| 2. a | Define spot speed, time mean speed and space mean speed . | 6M |
| b | Discuss about gap acceptance studies. | 6M |
| 3. a | Define Capacity. What is the importance of capacity in Highway Transportation studies | 6M |
| b | Discuss the concept of level of service in the HCM manual. | 6M |
| 4. a | What are the common methods of On-street parking? | 6M |
| b | Give the procedure for Parking usage survey by Patrolling method | 6M |
| 5. a | What are the various causes of road accidents? | 6M |
| b | What are the 3-E measures to reduce accidents? | 6M |
| 6. a | Write the advantages and disadvantages of traffic signals | 6M |
| b | Explain various Signal Co-ordination methods. | 6M |
| 7. a | Explain how the noise is generated by road traffic? | 6M |
| b | What is Air pollution? What are the effects of pollutants due to road traffic on the environment? | 6M |
| 8. | Write short notes on the following. | 12M |
| | i. parking index | |
| | ii. headways | |
| | iii. cordon survey | |
| | iv. time mean speed | |



Code No: G5604/R13

M. Tech. I Semester Supplementary Examinations, Jan/Feb-2018

REACTIVE POWER COMPENSATION & MANAGEMENT

Common to Power Systems(56),PSC &A(53) ADV PS(50),EPE(60),EPS(65) and Power
Electronics & Power Systems (99)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | | |
|----|---|--|-----|
| 1. | a | Discuss how a Load Compensator works as a voltage regulator | 6M |
| | b | Explain the approximate reactive power characteristics. | 6M |
| 2. | | Explain in detail of transient state reactive power compensation in transmission system by using shunt and series compensation | 12M |
| 3. | a | Describe the effect of harmonics and radio frequency on reactive power compensation | 8M |
| | b | Explain the need of reactive power management. | 4M |
| 4. | a | Explain the effects of Reactive Power in Various elements of Power System | 6M |
| | b | Discuss in detail of the various methods for loss reduction | 6M |
| 5. | a | What are the functions of using capacitors as compensators | 4M |
| | b | Briefly discuss how to select a capacitor for user side reactive power management | 8M |
| 6. | a | Discuss the load trends in demand side management. | 4M |
| | b | Explain Reconfiguration methods and Optimizing power flows method used for reduction of losses in power systems. | 8M |
| 7. | a | Explain briefly surge impedance and natural loading of an uncompensated transmission line. | 6M |
| | b | Explain the filter requirements for reactive power management in electric traction systems and furnaces. | 6M |
| 8. | a | Explain how shunt compensation is obtained by means of Mid-point shunt reactor or capacitor in transmission lines | 6M |
| | b | What are the different load patterns available and also explain the basic methods of load shaping? | 6M |

1 of 1



Code No: G5701/R13

M. Tech. I Semester Supplementary Examinations, JAN/FEB -2018

DIGITAL DESIGN USING HDL

Common to VLSI, VLSID, VLSISD, VLSI&ME and DS&CE

Time: 3 hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Mark*

- | | | |
|----|--|--------|
| 1. | i) Write the syntax and example of VHDL entity. | 4 |
| | ii) Write the Verilog HDL Structural Models of full adder | 4 |
| | iii) Write the difference between Verilog and VHDL. | 4 |
| 2. | a Discuss on various descriptive styles available for hardware modelling using Verilog HDL. | 6 |
| | b With relevant examples, explain the concept of inertial delay effects in Verilog HDL. | 6 |
| 3. | a Write the Verilog for 8X1 Multiplexer using behavioural model. | 6 |
| | b Write about Verilog Operators, and its precedence in detail. | 6 |
| 4. | Briefly explain dataflow models of a linear feedback shift registers. | 12 |
| 5. | Explain the following terms.i). Simulation. ii). Synthesis. iii). Concurrency. iv). Test bench | 4×3=12 |
| 6. | a Explain about synthesis of Gated clocks | 6 |
| | b Explain about synthesis of Latches. | 6 |
| 7. | a Write if brief about Three state Buffer. | 6 |
| | b Explain about synthesis of Edge triggered Flip Flops | 6 |
| 8. | Write a short notes on (i) PCB (ii) CAD tools | 6+6 |



Code No: G6801/R13

M. Tech. I Semester Supplementary Examinations, JAN/FEB-2018

MICROCONTROLLERS FOR EMBEDDED SYSTEM DESIGN
(Common to VLSI&ES, ES&VLSI, VLSID&ES, ES and ES&VLSID)

Time: 3 hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

- | | | |
|------|---|--------|
| 1. a | What is meant by ARM, Explain the ARM design philosophy | 6M |
| b | Explain the different types of ARM processor families | 6M |
| 2. | What is meant by ARM, explain the instruction set of ARM programming model-1 | 12M |
| 3. a | Explain about ARM programming with one example | 6M |
| b | With a suitable example, Explain about the conditional execution | 6M |
| 4. a | Explain about ARM programming with one example | 6M |
| b | With a suitable example, Explain about the conditional execution and loops in ARM programming | 6M |
| 5. a | Explain about the Memory management unit and page tables | 6M |
| b | Explain about the cache architecture in memory management | 6M |
| 6. a | Explain about the interrupts and vector table of ARM | 6M |
| b | Explain about the architecture revision | 6M |
| 7. a | What is meant by stack, explain with a suitable example | 6M |
| b | Explain about the pointers and structures of ARM programming | 6M |
| 8. | Write a short notes on
(i) content switch
(ii) register allocation
(iii) flushing and caches | 3×4=12 |

1 of 1



Code No: G8702/R13

M. Tech. I Semester Supplementary Examinations, Jan/Feb -2018

MATRIX ANALYSIS OF STRUCTURES

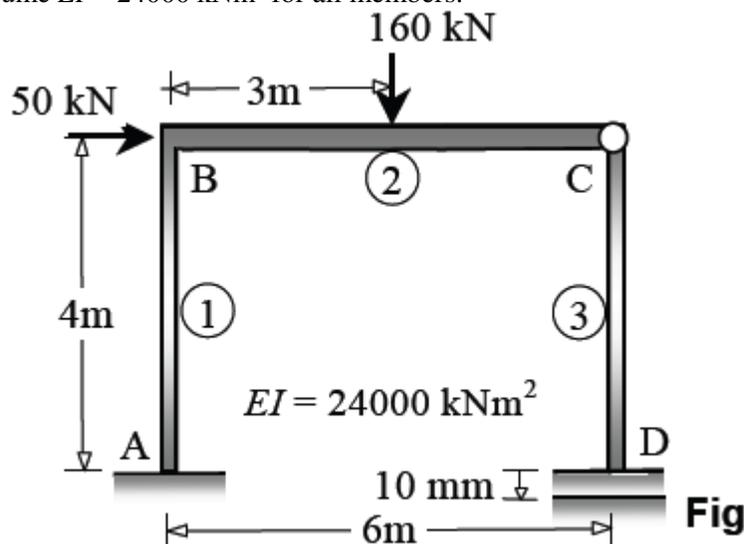
Common to Structural Engineering (87), Structural Design (85)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

- | | | |
|------|---|-----|
| 1. a | Write the difference between stiffness and flexibility methods | 6M |
| b | Explain about Degree of freedom | 6M |
| 2. a | List the properties of the stiffness matrix | 6M |
| b | Derive structure stiffness matrix equation | 6M |
| 3. | i) Derive expression for stiffness of a grid element?
ii) Derive stiffness formulation for a curved beam element in vertical plane? | 12M |
| 4. | Derive the relation for the coordinate transformation for element stiffness matrix for a truss element from element to global coordinate system in displacement method | 12M |
| 5. | i) Derive the stiffness matrix for triangular Element?
ii) Discuss about local and global coordinates and transformation matrix | 12M |
| 6. | Derive step by step of Stiffness method for Grid elements with an example | 12M |
| 7. | Analyse the portal frame shown in Fig. (with an internal hinge at C, loading and support settlement of 10mm at D, as shown) by the reduced stiffness method, ignoring axial deformations, to find (a) the horizontal deflection at B, and (b) the hogging moment at B. Assume $EI = 24000 \text{ kNm}^2$ for all members. | 12M |



8. Derive the relation for the coordinate transformation for element stiffness matrix for a truss element from element to global coordinate system in displacement method? 12M

