Subject Code: G0403/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

SPECIAL MANUFACTURING PROCESSES

(Common to CAD/CAM and AMS)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. (a). Explain the principle of Electroforming with neat sketch. What are its advantages.
   (b). What are the advantages of cladding. (8+4M)

2. (a). Compare the advantages and limitations of Metal-Matrix Composites, Reinforced Plastics, Ceramic-Matrix Composites.
   (b). Write short notes on hot compaction (8+4M)

3. Explain the principle of working of LIGA with neat sketch. what are the purposes of pre baking and post baking in lithography. (12M)

4. (a). Briefly discuss the applications and limitations of WJM. (6+6M)
   (b). With help of neat sketch describe the mechanism of material removal in EDM.

5. (a). Describe the working principle of Stratasys' Fused Deposition Modeling with a neat sketch.
   (b). Explain the limitations of rapid manufacturing. (8+4M)

6. (a). Write short notes on polymer matrix composites. (5+7M)

   (b).With a neat sketch, explain the principle of wire EDM. What are its applications.

7. (a). Explain the working of ion implantation process with neat sketch.
   (b). Explain any one indirect rapid tooling with neat sketch. (6+6M)

8. write short notes on following: (4M+4M+4M)
   (a) Principle of low pressure Chemical vapour deposition.
   (b) Wafer preparation
   (c) Characteristics of ceramics.

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Subject Code: G0502 /R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

COMPUTER ORGANIZATION/

COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to CS and CS&E)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Explain how Addition and Division operations are performed on numbers when they are represented in
   a) Signed Mode and
   b) Floating point mode with examples.

2. Explain Gray Code and Error Detecting Codes in detail.

3. Explain Organization and usage of Encoders and Full Adders.

4. Explain in detail any two mapping procedures employed in the organization of Cache memory.

5. In reference to Main memory, explain Memory address map.

6. Explain any Multiplication algorithm adopted in the design of ALU. Trace the algorithm with an example.

7. Give a good account of Asynchronous Data Transfer.

8. Explain in detail any two protocols of Serial Communication.

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Subject Code: G0601/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

WIRELESS COMMUNICATION AND NETWORKS

(DS&CE)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. a) Briefly explain the principle of Cellular Networks.
   b) Explain in detail the different techniques used to improve Coverage & Capacity in Cellular Systems

2. a) Explain the Handoff mechanisms in mobile systems? Classify different hand off mechanisms and define each technique?
   b) Give the general formula to find the value of 'K' and find out the frequency reuse distance with available 'K' value.

3. a) With neat sketch explain Knife-edge Diffraction Model.
   b) Explain the significance of Walfisch and Bertoni Model.

4. a) With neat sketch explain Ground Reflection (Two-Ray) Model
   b) What are the propagation mechanisms of EM waves

5. a) What are the factors influencing Small scale fading? Explain
   b) Explain the different types of multipath propagation in wireless communication

6. a) Explain the basic idea behind linear equalizer and derive the expression for its minimum mean square error.
   b) Briefly explain about ZF feedback equalizer

7. a) Explain IEEE 802.11 Medium Access Control
   b) Write the differences between IEEE 802.11 a,b, g and n standards

8. Write short notes on
   a) Hiper Lan,
   b) Macro diversity
   c) GOS

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Subject Code: G1503/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

ADVANCED MECHANISMS

(Common to MD and MED)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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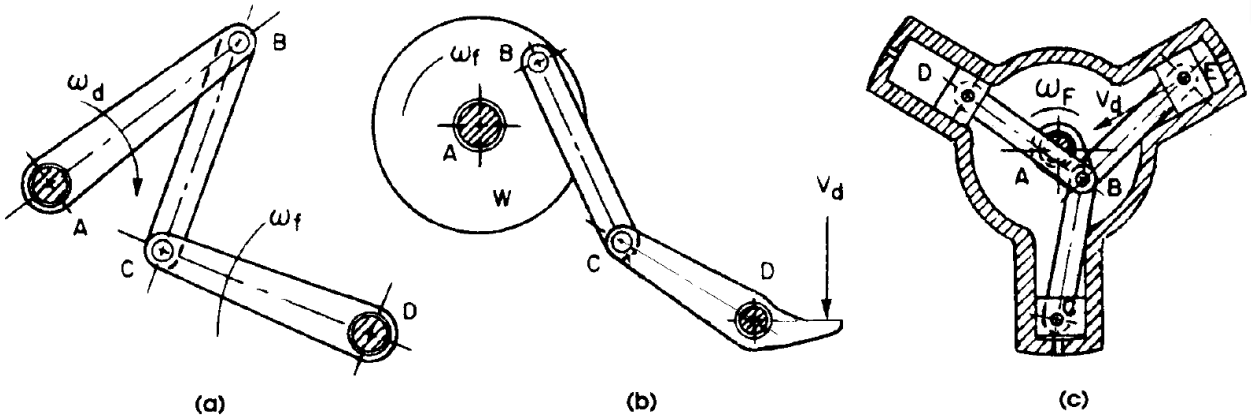
1) Find the DOF of the following mechanisms 12M



2) (a) Derive the Euler-savary equation for two planes rolling on their centroids. 4M

(b) Explain the inflection circle and its significance. 4M

(c) Explain Hartmann's construction for plane motion. 4M

3) (a) Design a fourbar Grashof crank-rocker to give 45^0 of rocker rotation with equal time forward and back from a constant speed motor input. 6M

(b) Synthesize a four bar linkage to give the following values for the angular velocities and accelerations. 6M

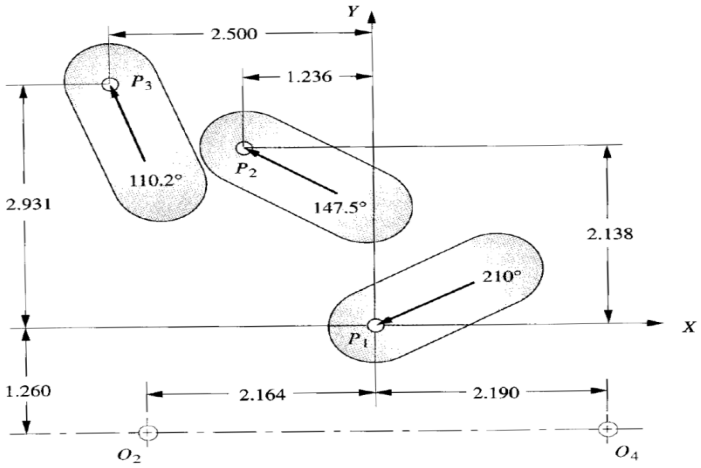
ω_2= 200 rad/s ω_3= 85 rad/s ω_4= 130 rad/s

α_2=0 rad/sec^2 α_3=-1000 rad/sec^2 α_4=-1600 rad/sec^2

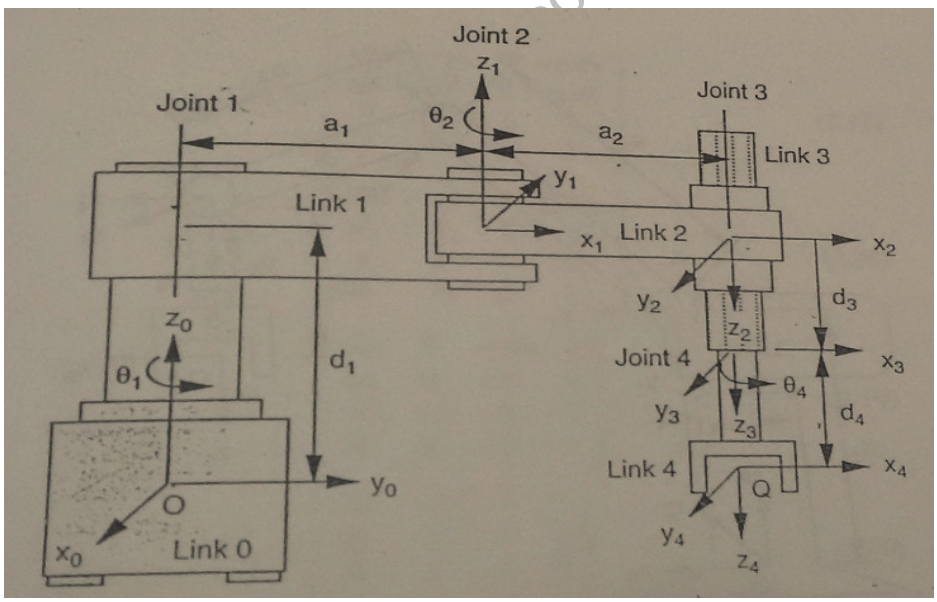
4) Provide a time ratio of 1:1.4 with 90^0 rocker motion for six bar drag link quick return linkage. 12M

Subject Code: G1503/R13

5) Design a linkage to carry the body in below figure through the two positions P1 and P2 at the angles shown in figure. Use analytical synthesis without regard for the fixed pivots shown. Hint: Try the free choice values z=1.075, ø=204.4^0 , β_2=-27^0 , s=1.24, γ_2=-40^0, ψ=74^0 All dimensions are in meters 12M



6) Solve the inverse kinematics of the 4-dof SCARA arm shown in figure. Discuss how the orientation of the end effector can be specified. 12M



7) (a) Explain about the D-H transformation matrix. 6M
(b) Explain about the Burmester's curve. 6M

8) (a) Explain the function generation by velocity pole method. 6M
(b) Explain the precision derivative approximation. 6M

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Subject Code: G2103/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

ADVANCED HEAT & MASS TRANSFER/

ADVANCED HEAT TRANSFER

(Common to TS&ES and TE)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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Note: Use of heat transfer data book, steam tables and charts are permitted.

1. a) What is meant by lumped-capacity? Derive the expression for temperature distribution.
   b) A slab of aluminium 5 cm thick initially at a temperature of 200°C is suddenly immersed in a liquid at 70°C for which the convective heat transfer coefficient is 525 W/m^2-K. Determine the temperature at a depth of 12.5 mm from one of the faces 1 minute after the immersion; also calculate the energy removed per unit area from the plate during 1 minute of immersion.
   Take ρ=2700kg/m^3, c=0.9kJ/kg-K, k=215 W/m-K α =8.4 X 10 $^{-5}$ m^2 /s [4+8]

2. a) Develop a backward-difference formulation for a boundary node subject to a convective environment
   b) Using the approximate integral approach derive the equation for local skin friction coefficient for hydrodynamic boundary layer and show that: [6+6]

$$Cfx = \frac{0.646}{\sqrt{\mathrm{Re}\, x}}$$

3 a) Air at 65°C flows over a heated flat plate at 120°C with a velocity of 0.915 m/s. determine the local heat transfer coefficient at a distance of 0.61 m from the leading edge of the plate and heat transfer for 0.61 m length taking the width of plate as 1 m.

(υ = 0.223 x 10^{-4} m^2/s, k = 0.0313 W/m K.)

   b) Show the relation between heat transfer and friction coefficient by using Reynolds analogy for laminar flow over a flat plate. [6+6]

4. a) A vertical plate 30mm wide and 1.2 m height is maintained at 70°C and is exposed steam at 1 atmospheric pressure. Calculate the heat transfer coefficient ant total mass of steam condensed per hour.
   b) Explain the mechanisms forced convection boiling phenomenon inside a tube. [8+4]

Subject Code: G2103/R13

5 a) Show that $\varepsilon = \dfrac{1}{(1/\varepsilon_{1)} + (1/\varepsilon_2) - 1}$ for radiation exchange between large parallel gray planes.

b) Dry air at27°C and 1 atm. flows over a wet flat plate 50cm long at a velocity of 50m/s. Calculate the mass transfer coefficient of water vapour in air at the end of the plate. [6+6]

6 a) A plate of size 20 cm X 30cm is used as a water heater in a process plant. The temperature of water is 20 ^{o}C while the heater plate is maintained at a temperature of 120 ^{o}C .Determine the heat transfer rate by free convection when 20cm side of the heater is kept vertical.

b) Discuss about the correlations of fully developed laminar flow through a circular tube. [8+4]

7 a) Discuss about hydro-dynamic and thermal boundary layers of free convection on vertical plate.

b) Water is to be boiled at atmospheric pressure in a polished copper pan by means of an electrical heater. The diameter of heating unit is 0.8m and is maintained at uniform temperature of 110˚C.Calculate:

i) The power required to boil the water

ii) The rate at which the water will evaporate from the pan due to the boiling process and

iii)Peakheatflux [4+8]

8 a) With Nusselts assumptions for laminar condensation on a vertical flat plate prove that the average heat transfer coefficient (h_m) is 4/3 times the local heat transfer coefficient

b) Define Ficks law of concentration and from that deduces diffusion resistance. [8+4]

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Subject Code: G2203/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

TRAFFIC ENGINEERING

(Transportation Engineering)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Spot speed study was conducted at a stretch of a highway and consolidated the collected data as given below:

Speed Range, Km/hr	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of vehicles observed	35	40	60	150	250	290	60	70	20

Determine

(a) The upper and lower of speed for speed regulation of mixed traffic

(b) The design speed for checking geometric design of the highway

(c) The median speed observed

2. (a) State the factors affecting LOS on urban roads with reference to IRC:106?

(b) A study was conducted on a selected road section and found that one way traffic stream speed as 40 km/hr. Average length of the vehicles is 6.1 m.

Determine

(i) theoretical capacity and

(ii) practical capacity of the study road in terms of veh/hr/lane? Assume, reaction time (t_p) of driver as 0.7 sec for determination of theoretical capacity; average length of vehicle (a_1=) 6m, reaction time of the drivers (a_2) = 2.5 sec and coefficient of longitudinal friction (f) = 0.39.

3. (a) Classify and explain the parking inventory surveys?

(b) The following is the sample data collected by license plate parking survey which was conducting at a parking lot in a City. The license plate numbers and occupancy on specific spaces are recorded. Calculate parking load, parking capacity and efficiency of the parking lot.

Space #	License plate Numbers of vehicles with duration of stay in minutes			
	0-15 min.	15-30 min.	30-45 min.	45-60 min.
1	1330	1330	-	-
2	3049	3049	3049	3049
3	0635	-	7980	-
4	6606	7077	7077	0555
5	8181	4400	8383	0127
6	6745	6745	6745	6745
7	2020	1947	1947	2015
8	2099	2099	1010	1010
9	6111	6111	2244	2244
10	6699	7117	0909	1212

Subject Code: G2203/R13

4. (a) The following are the data collected for designing a 2-phase fixed type signal at an intersection having North-South and East-West approach roads. It is intended to straight ahead traffic is permitted to operate in these approach roads.

Parameter	Approach Road			
	North	South	East	West
Design hr. flow (PCU/hr)	805	750	800	590
Saturation flow (PCU/hr)	2500	2500	2100	2100

The time lost per cycle = 12.0 sec
Determine the optimum cycle length as per Webster formula? Also calculate effective greentime per phase North-South and

(b) A pre-timed 4-phase signal has critical lane flow rates observed for the first 3-phases as 178, 190 and 195 veh/hr. Take saturation flow for all the phases as 1505 veh/hr. The time lost per phase is 4 sec. If the optimum cycle length obtained by Webster formula is 67 sec, the effective green time (sec) of the 4^{th} phase would be.

5. (a) Stet the detrimental effects of traffic on environment
(b) Explain how the air pollution is measured and controlled?

6. (a) Write short note on accident studies with a few sample diagrams?
(b) State the factors related to road and vehicle that influence to cause road accidents?

7. (a) Briefly explain the traffic volume surveys which are conducted by intrusive-device methods
(b) Describe the following two types of coordinated traffic signal control systems
(i) Double Alternate Signal Control System with Half Cycle Offset
(ii) Flexible Progressive Signal Control System on One-way Street: Quarter Cycle System

8. (a) Traffic volume on a section of a rural road during morning peak hour is found as 600 veh/hr and during the evening peak hour is 660 veh/hr. The following is the detail of traffic composition:
For Morning Peak: 50% cars, 30% Motor Cycle & Scooter, 10% buses & trucks, 5% Cycle-rickshaw, 2% Agricultural Tractor-trailer and 1% Bicycle.
For Evening Peak: 45% cars, 35% Motor Cycle & Scooter, 5% buses & trucks, 10% Cycle-rickshaw, 2% Agricultural Tractor-trailer and 3% Bicycle.
Determine which peak hour traffic is the congested condition compared to each other?

(b) A 2-lane urban road with 1-way traffic flow control was designed to a maximum capacity of 2000 veh/hr. Under the jam condition, the average length occupied the vehicles is 6.2 m. Assume the speed versus density relationship is linear. What is the density (veh/km) value, if the traffic volume found as 1000 veh/hr.

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Subject Code: G4303/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

ELECTRIC DRIVES-I

(Common to PE, P&ID, PE&ED, PE&D and EM&D)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Draw the schematic diagram of separately excited DC motor fed from a single-phase full converter. With the help of neat waveforms, discuss its operation under discontinues mode of operation. Derive the expression for output DC voltage of converter under discontinues mode. (12)

2. a) Discuss the advantages of three-phase converters over single-phase converters.
   b) A separately excited dc motor is controlled from a three-phase full-converter fed from a 460V, three-phase, 60 Hz ac supply. The dc motor details are as follows: 250 hp, 500V, 1250 rpm, R_a=0.052Ω, L_a= 2mH.
   i) Find the rated current and K_b when the field is maintained at rated value.
   ii) Draw the torque speed characteristics as a function of triggering angle, α. (4+8)

3. The speed of a 20-hp, 300V, 1800-rpm separately excited DC motor is controlled by a three-phase full-converter drive. The field current is also controlled by a three-phase full converter and is set to a maximum possible value. The ac input is a three phase, star-connected, 208V, 60Hz supply. The armature resistance is R_a=0.25Ω, the field resistance is R_f=245Ω, and the motor voltage constant is K_v=1.2 V/A rad/s. The armature and field currents are assumed to be continuous and ripple free. The viscous friction is negligible. Determine i) the delay angle of the armature converter, α_a if the motor supplies the rated power at the rated speed; ii) the no-load speed if the delay angles are same as in (i) and the armature current at no-load is 10% of the rated value; and iii) the speed regulation. (12)

4. For a DC motor drive, derive the transfer functions for the motor, converter, current and speed controllers. (12)

5. What is four quadrant operation of an electric drive? With a neat schematic diagram, discuss the operation of closed loop four quadrant DC motor drive. (12)

6. What are choppers? What are its applications? Discuss the operation of a four quadrant chopper. (12)

7. Give the detailed steady state analysis of DC-DC convertor fed dc motor drive. (12)

8. What is the need for speed controllers and current controllers in electric drives? Also explain the design of speed controllers and current controllers. (12)

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Subject Code: G4503/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

ADVANCED DIGITAL SIGNAL PROCESSING

(Common to SSP, DIP, CE&SP, C&SP, SP&C DE&CS, ECE, CS, MCE, and DECE)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1) a) A causal LTI discrete time system develops an output
$y[n] = (0.4)^n u[n] - 0.3(0.4)^{n-1} u[n-1]$
for an input $x[n] = (0.2)^n u[n]$. Develop a parallel form I realization of the system.
b) Compare the different realizations of an IIR filter of order M.

2) a) What is frequency warping effect? How it eliminates.
b) Estimate the order of a linear phase lowpass FIR filter by using Kaiser's formula?
Passband edge $F_p = 1.8\ Hz$
Stopband edge $F_s = 2\ Hz$
Passband ripple $\alpha_p = 0.1\ dB$
Stopband ripple $\alpha_s = 35\ dB$
Sampling frequency $F_T = 12\ KHz$

3) a) Explain about Goertzel's Algorithm ?
b) Explain about fixed point and floating point representation of numbers with an example?

4) a) Define truncation error? Explain the quantization process of fixed point numbers.
b) Show that Signal-to-noise of the first order IIR digital filter with input is WSS and uniformly distributed is
$\frac{(1-|\alpha|)^2}{3{\sigma_0}^2}$

5) a) Develop a Cascaded Lattice Realization of an FIR transfer function
$H(z) = 1 + 1.2z^{-1} + 1.12z^{-2} + 0.12z^{-3} - 0.08z^{-4}$
b) What is Gibbs Phenomenon? Explain with neat sketches.

6) a) Explain the computation of energy density spectrum from finite duration observations of signals and also discuss about 'spectral leakage'.
b) List out the limitations of non-parametric methods over parametric methods of spectral estimation?

Subject Code: G4503/R13

7) a) Explain dynamic range scaling using an absolute bound?
   b) What is the importance of FFT algorithm? Construct a complete flow graph of the basic decimation in frequency FFT algorithm for N=8.

8) Write short notes on the following
   a) Limit cycles in IIR Digital filters
   b) Square root and Logarithm approximation

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Subject Code: G5604/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

REACTIVE POWER COMPENSATION & MANAGEMENT

(Common to PS, PSC&A, EPE, EPS, PE&ES and APS)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. (a) What are reactive characteristics of ideal load compensator? Discuss its objectives.
   (b) Explain the method of phase balancing and power factor correction of unsymmetrical loads.

2. (a) Explain the reactive power biasing is obtained with inductive and capacitive systems.
   (b) Explain the compensation in transmission lines using synchronous condensers

3. Discuss in detail about dynamic shunt compensation in transmission lines.

4. (a) Discuss about the four characteristic time periods of a transient state in a compensated transmission line.
   (b) Explain how shunt compensation is obtained by means of Mid-point shunt reactor or capacitor in transmission lines.

5. Define reactive power management and explain the mathematical modeling of reactive power dispatching strategy.

6. (a) Discuss the effects of under voltage on the performance of induction motor with necessary diagrams.
   (b) What is electromagnetic interference? Explain sources of EMI and methods to minimize it.

7. (a) Explain the various system losses and the loss reduction methods used in distribution side reactive power management.
   (b) Explain kVAR requirements for domestic appliances in User side reactive power management.

8. (a) Give the layout of electric traction system and discuss reactive power requirements of the same.
   (b) Explain the power factor of an electric arc furnace.

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Subject Code: G5701/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

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 marks

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1. a. Explain the importance of Signal & variable with example. (8M)
   b. Explain dataflow, behavioural & structural modelling in VHDL with half adder as an example. (8M).

2. a. Write VHDL program for carry look-ahead adder. (8M).
   b. Write a short note on FSM using CAD tools by taking serial adder as an example. (8M).

3. a. Write a short note on propagation delay & continuous assignment statements with an example. (8M).
   b. Briefly explain dataflow models of a linear feedback shift registers. (8M).

4. a. Explain synthesis of sequential logic for any 2 flip-flops. (8M).
   b. Briefly explain explicit & implicit state machines. (8M).

5. a. Write a short note on testing of Logic Circuits. (8M).
   b. Explain random tests & built-in-self test. (8M).

6. a. Explain ASM & ASMD charts for behavioural modelling. (8M).
   b. Write a Verilog program on encoders & decoders using behavioural modelling. (8M).

7. a. Explain different Verilog data-types with examples. (8M).
   b. Explain logic simulation, design verification & test methodology. (8M).

8. a. Write VHDL program for 3 bit up counter using JK flip-flop. (8M).
   b. Briefly explain different types of shift-registers with block diagrams. (8M).

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Subject Code: G6801/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

MICRO CONTROLLERS 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

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1	a	Define Embedded system,explain with real time application	[6]
	b	Why we are using the controllers in the embedded systems,explain in detail	[6]
2		What is meant by ARM,explain the instruction set of ARM programming model-1	[12]
3	a	What is the difference between instruction set and thumb instruction set	[6]
	b	Explain about the Branch instructions and register usage instructions	[6]
4	a	Explain about ARM programming with one example	[6]
	b	With a suitable example ,Explain about the conditional execution and loops in ARM programming	[6]
5	a	Explain about the Meory management unit and page tables	[6]
	b	Explain about the cashe architecture in memory management	[6]
6	a	Explain about the interrupts and vector table of ARM	[6]
	b	Explain about the architecture revision	[6]
7	a	What is meant by stack,explain with a suitable example	[6]
	b	Explain about the pointers and structures of ARM programming	[6]
8		Write a short notes on a. content switch b. register usage c. flushing and cashes	[12]

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Subject Code: G8702/R13

M. Tech –I Semester Regular/Supply Examinations, February, 2016

MATRIX ANALYSIS OF STRUCTURES

(Common to SE and SD)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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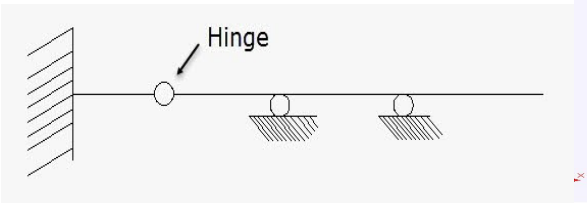
1. a) Define degree of static indeterminacy. Determine degree of static & kinematic indeterminacy of the following structures. Fig 1.1, 1.2 & 1.3
   b) Analyze the following structure using flexibility matrix method and sketch bending moment diagram. Fig 1.4



a. Fig 1.1

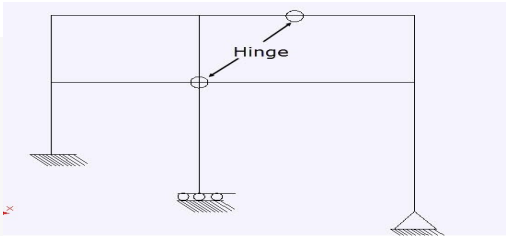
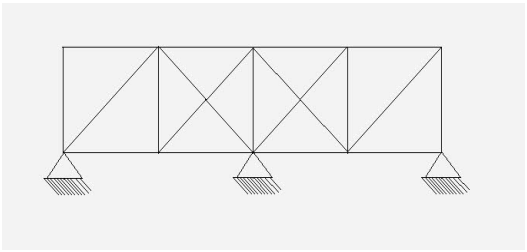


Fig 1.2



2. Fig 1.3

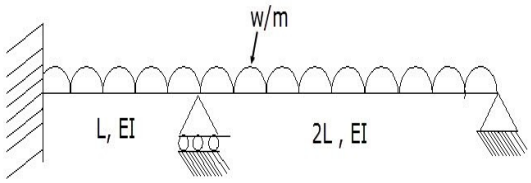
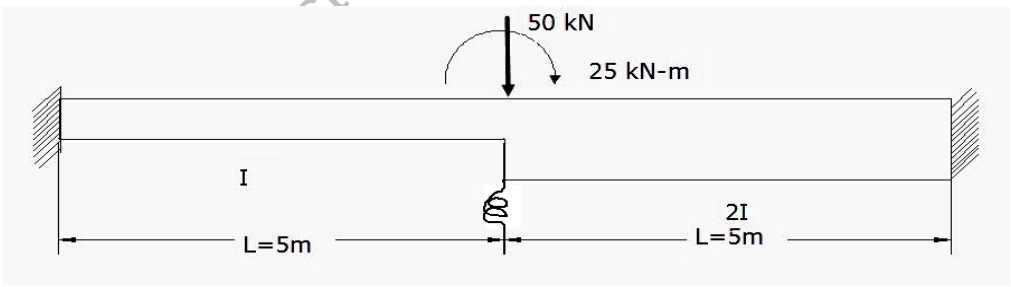
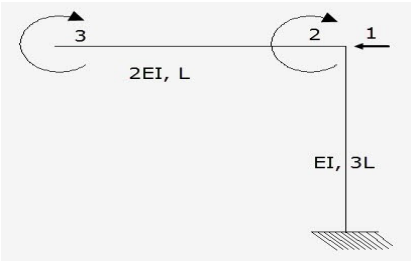


Fig 1.4

2. Analyze a non – Prismatic fixed beam with carries loading as shown in Fig by stiffness method. It is supported by spring of stiffness K= EI/L and L is span of the beam. Sketch bending moment diagram.

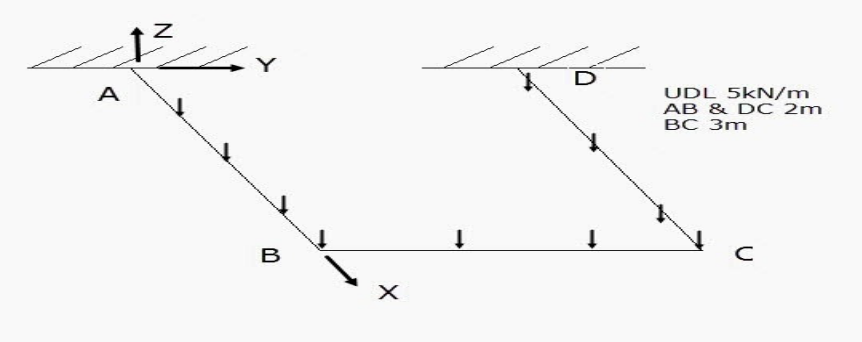


3. a) Develop Element Stiffness matrix for truss element.
   b) Generate the stiffness matrix for the cantilever bent shown below.

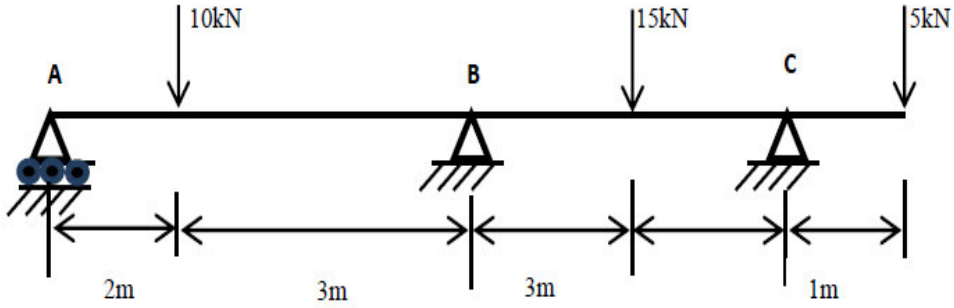


Subject Code: G8702/R13

4. Analyze the plane grid shown below. Ignore shear deformation.
   $E = 14 \times 10^6$ kN/m^2 $G = 6.36 \times 10^6$ kN/m^2 $I_{AB\ or\ DC} = 1070 \times 10^{-6}$ m^4
   $J_{AB\ or\ DC} = 749 \times 10^{-6}$ m^4 $A_{AB\ or\ DC} = 0.08$ m^2 $\gamma = 1.2$
   $I_{BC} = 1070 \times 10^{-6}$ m^4 $J_{BC} = 749 \times 10^{-6}$ m^4 $A_{BC} = 0.08$ m^2



5. 5Analyze the beam shown below using stiffness method and sketch bending moment diagram



6. Explain
   a) Banded Matrix and Semi Band Width.
   b) Concept of beam on elastic foundation.
   c) Method of static condensation
   d) Method of sub structuring for analysis of large structures.

7. An infinitely long beam on elastic foundation is subjected to a point load, W. Analyze the beam and find the maximum bending moment, Maximum Shear force and their locations in the beam. Assume soil modulus be k and flexural rigidity EI.

8. a) Discuss about Transformation matrix from Local to Global coordinates?
   b) Explain with an example for member stiffness of space truss?

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Subject Code: C5803/R09

M. Tech –I Semester Supply Examinations, February, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to NN, CSE, CS and CST)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Explain how Addition and Division operations are performed on numbers when they are represented in
   a) Signed Mode and
   b) Floating point mode with examples.

2. Explain Gray Code and Error Detecting Codes in detail.

3. Explain Organization and usage of Encoders and Full Adders.

4. Explain in detail any two mapping procedures employed in the organization of Cache memory.

5. In reference to Main memory, explain Memory address map.

6. Explain any Multiplication algorithm adopted in the design of ALU. Trace the algorithm with an example.

7. Give a good account of Asynchronous Data Transfer.

8. Explain in detail any two protocols of Serial Communication.

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