Subject Code: G0402/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015

COMPUTER AIDED MANUFACTURING

(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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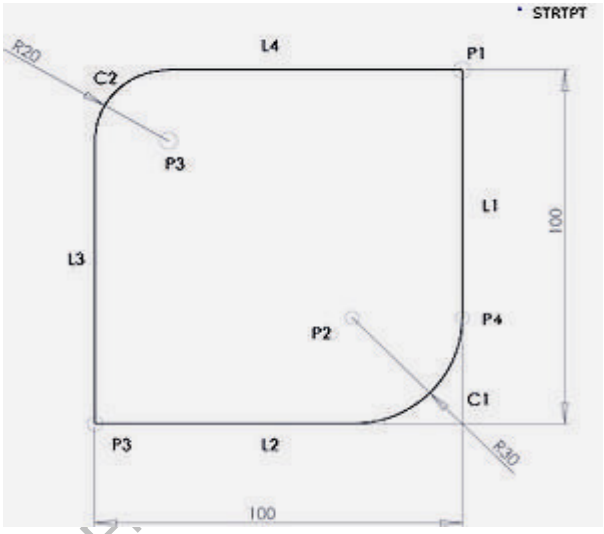
1. a) With the help of a neat sketch explain the flow of manufacturing information in the State– of- the- art CAD/CAM/CNC Chain.
   b) What are the advantages of CAM?

2. a) Briefly explain any 3 types of geometry commands used in APT.
   b) Write the APT program for the geometry shown in Figure 1 below:



3. a) Discuss about preset and Qualified Tooling systems used in CNC machines. Also describe about Automatic Pallet Changer (APC)
   b) Explain with the help of neat sketches the working of Automatic Tool Changer (ATC)

4. a) Describe Adaptive Control with Optimization for a milling machine with a neat sketch.
   b) Compare CNC with DNC and mention the advantages and disadvantages of DNC.

Subject Code: G0402/R13

5. a) What is a process plan? And what are the various steps in developing a process plan?
   b) What are different approaches to CAPP? Describe briefly.

6. a) What is PLC? Draw the basic structure of PLC and discuss the various hardware components of PLC.
   b) Discuss the advantages of microcontrollers over microprocessors

7. a) With the aid of a neat diagram, explain the structure of a post processor in a NC System.
   b) Explain about DAPP-based-Post processor.

8. a) How do you Classify Inspection methods? Explain the principle of operation of Non Contact type Optical Inspection methods.
   b) With help of a neat sketch explain the functioning of a CMM. Also mention the advantages and limitations of it.

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Subject Code: G0501/R13

M. Tech –I Semester Regular/Supplementary Examinations, April, 2015

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(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. a. What are well formed formulas ?Prove that **[(pΛq)—>r] —>[p—>(qVr)]** is a tautology?
   b. Obtain PCNF,PDNF for the formula **p (pΛ (q—>p))** using truth table?

2. a. Write about Symmetric, Anti symmetric, Asymmetric properties of a binary relation with examples?
   b. Define bisection function and verify which of the following functions are one-one? Which are onto?
   (i) **f(x)=x+1** where f is defined from **R into R**.
   (ii) **$f(x)=x^2$** where f is defined from **R into R**.

3. a (i) How many ways can get a sum of **8** when two indistinguishable dice are rolled ?
   (ii) How many different license plates are there that involve 1,2, or 3 letters followed by 4 digits?
   b. What is the coefficient of x^3y^7 in $(x+y)^{10}$?

4. a. Find Generating function for a_r =The number of ways the sum **r** can be obtained when 2 distinguishable dice are rolled and the first show an even number and the second shows an odd number.
   b. Calculate the coefficient of X^{10} in generating functions $1/(1-X)^5$?

5. a. Write an algorithm Breadth First Search for a spanning tree and explain with an example?
   b. What is a planar graph and discuss the planarity of $K_{3,3}$?

6. a. Represent the following using predicate logic
   All men are fallible
   All kings are men
   Therefore, all kings are fallible
   b. Explain Group, Monoid Homomorphism ?

7. a. Use multinomial theorem to expand $(x_1+x_2+x_3+x_4)^4$?
   b. Find the general formula for Fibonacci sequence given ?
   $f_n=f_{n-1}+f_{n-2}$ $n>=2$ $f_0=0$,$f_1=1$

8. a. What is a Chromatic number and obtain the chromatic number for Petersen graph?
   b. Define predicate logic and propositional logic and explain with examples?

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Subject Code: G4301/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015

ELECTRICAL MACHINE MODELING AND ANALYSIS

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

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

Answer any FIVE questions

All questions carry EQUAL marks

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1 a). What is generalized machine theory? What are the restrictions of generalized machine theory?

b). Draw and describe voltage equations of the i) basic two pole machine diagram and ii) primitive machine diagrams for the following machines. D.C compound machine, poly phase Induction machine and synchronous machine?

2 a). Starting from fundamentals obtain the matrix form of a D.C. series motor?

b). Develop machine model for a d.c. compound motor, with the help of neat schematic diagram and primitive diagram. Arrange the final equations in state space form?

3 a). Explain the steps involved in the computation of dc motor response under steady state?

b). Discuss how the linearization techniques are applied for small perturbations in the dc motor?

4 In the transformation between abc and stationary dq0 prove that $\vec{i} = \sqrt{2}\, I_a e^{j\omega_s t}$

5 Draw the basic circuit model for a 3-phase induction motor for stator as well as rotor and obtain voltage equations in the form of matrices in terms of stator and rotor currents?

6 Obtain the expressions for a 3-phase induction motor (Voltage and current) in state variable form in
i) stator reference frame and ii) synchronously rotating frame.

7 From the basic equation, derive the expression for voltages in direct axis, quadrature axis, field current and zero sequence voltage for a synchronous machine?

8 From the basic equation, Obtain the dynamic model of switched reluctance motor?

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Subject Code: G6802/R13

M. Tech – I Semester Regular/Supplementary Examinations, April, 2015

VLSI TECHNOLOGY AND DESIGN

(Com to VLSI&ES, ES&VLSI, VLSID&ES, ES&VLSID, VLSI, VLSID, VLSISD, VLSI&ME, DS&CE, DE&CS, E&CE, CS andDECE)

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

Answer any FIVE questions

All questions carry EQUAL marks

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1. a) What are the varieties of design layout of wiring trees in the wires and delay?
   b) With neat sketches describe the various Layout Design methods

2. a) Give a generic IC design flow chart and explain.
   b) Explain the technology independent and technology dependant strategies of logic optimization used in logic synthesis

3. a) What are the various marks used in CMOS p-well process? What is the significance of each.
   b) Compare bipolar and CMOS technologies.

4. a) Explain the clocking Analysis related to sequential systems.
   b) Draw and explain the cross section of a pair of stacked capacitor DRAM cell.

5. a) Explain in detail the electrical model of a MOS transistor
   b) What are the effects of scaling of Vt?

6. a) Explain system-on-chip concept using platform based design.
   b) What are the various floor-planning tips and explain it?

7. What are various switch logic circuits? Compare their merits and demerits.

8. a) Write a short note on High level synthesis.
   b) Write notes on Architecture Testing related Architecture VLSI Design.

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Subject Code: C5802/R09

M. Tech – I Semester Supply Examinations, April, 2015

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CS, CSE and CST)

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

Answer any FIVE questions

All questions carry EQUAL marks

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1. a. Prove that the following is a tautology using truth table?

   {[p—> (q V r)] Λ (¬q) } —> (p —>r)

   b. Define PCNF, PDNF and explain the law of duality with an example?

2. a. Use a contradiction argumentand verify the following valid inference?

   ¬p—> (q—>¬w) , ¬s—>q , ¬t, ¬p V t => w—>s

   b. Express the following with the help of predicate logic?

   (i) All dogs are carnivorous.

   (ii) some animals are dogs.

   (iii) some animals are carnivorous.

3. a. write about properties of binary relations ?

   b. Explain pigeon hole principle and write it's applications?

4. Explain semi groups ,monoids, groups ,sub groups with examples?

5. a. In how many ways can 23 different books be given to 5 students so that 2 of the students will have 4 books each and the other 3 will have 5 books each?

   b. write the expansion for $(2a+5b)^8$ using binomial theorem?

6. Solve the recurrence relation

   $\mathbf{a_n-7a_{n-1}+10a_{n-2}=0}$ **for** $\mathbf{n>=2}$ using generating functions?

7. What is a spanning tree ?Explain DFS and BFS with examples?

8. a. What is chromatic number and identify the chromatic number for $k_{3,3}$ graph?

   b. Explain Euler and Hamiltonian graphs with examples?

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