SUBJECT CODE NO:- K-8024
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (CAD/CAM) Examination Oct/Nov 2016
Computer Aided Manufacturing
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    i) Attempt any three questions from each section.
    ii) Assume suitable data wherever necessary by stating it clearly.
    iii) Draw neat sketches wherever necessary.
    iv) Figures to the right indicate full marks.

Section A

Q.1	a)	Define Automation. Elaborate maintenance & Repair Diagnostics functions of advanced automation.	06
	b)	With suitable sketches, explain open loop & closed loop control system in automated system.	07
Q.2	a)	Explain macro statements in Numerical control. Also, explain in brief G codes used for tool offset functions.	06
	b)	What is a CL data file? Explain its significance.	07
Q.3	a)	What are the part programming formats for NC? Explain each with suitable example.	06
	b)	Briefly explain points-to-point, straight cut & contouring NC motion control systems along with corresponding G codes.	07
Q.4	a)	Explain the concept of composite part/component in Group Technology with suitable sketch. Also, state GT cell Configurations.	06
	b)	Elaborate the applications of Group Technology.	07

Q.5   Write short notes on (any two)   14
    a) Post process or statements in APT
    b) Adaptive control system
    c) Quantitative Analysis in cellular manufacturing
    d) Advantage of GT (Group Technology)

Section – B

Q.6	a)	What is a flexible manufacturing system (FMS)? Explain in brief types of FMS.	06
	b)	Explain with sketches FMS loop payout & FMS ladder layout.	07
Q.7	a)	Describe the functions of material handling & storage system in FMS.	06
	b)	Explain in detail the different types of database requirements in Computer Integrated Manufacturing.	07
Q.8	a)	Elaborate with suitable sketch Esprit CIM-OSA model.	06
	b)	Explain the principle of variant process planning .Also, give its advantages & limitations.	07

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Q.9   a)   What are the objectives of CAQC? Explain Computer Aided inspection methods.   06
       b)   Discuss the role of Computer Aided Process Planning (CAPP) in CIM in detail   07

Q.10   Write short notes on (an two)   14
       (a)   FMS implementation issues
       (b)   Machine cell design in Group Technology
       (c)   Data requirements of Material Requirements Planning (MRP)
       (d)   Process Type layout Vs. Group Technology layout.

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SUBJECT CODE NO:- K-8052
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Robotics & Manufacturing Automation
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   1) Answer any three questions from each section.

Section A

Q.1	Write about the performance characteristics of robot.	13
Q.2	Explain different type of sensor used in Robotics briefly.	13
Q.3	Write about micro processor based pneumatic control in D.C. motor.	13
Q.4	Explain the method for special griper design analysis.	13
Q.5	Write short notes on any two:	14

     a) Robot kinematics
     b) Visco elastic analysis
     c) Rotary hydraulic drive.

Section-B

Q.6	Explain the application of robot in die casting and wire brushing	13
Q.7	Explain vision system with pre-processing segmentation in detail.	13
Q.8	What is image processing and smoothing of image? Explain.	13
Q.9	Explain cubic polynomial with via point's w.r.to robot path control.	13
Q.10	Write short notes on any two.	14

     a) Spot welding by robots.
     b) Control path
     c) Automatic visual impaction.

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SUBJECT CODE NO:- K-8100
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (CAD/CAM) Examination Oct/Nov 2016
Elective-IV: Robust Design of Products / Processes
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
- i) Solve any three questions from each section.
- ii) Assume suitable data if required .
- iii) Orthogonal Array tables.

Section A

Q.1 a)	Summarize Taguchi's quality philosophy in to the seven basic elements.	07
b)	Describe Application of robust design.	06
Q.2 a)	Explain briefly steps in Robust parameter design.	07
b)	Give some examples of variable characteristics.	06
Q.3 a)	Explain various loss functions.	06
b)	What is the difference between positive and negative information produced by an experiment?	07
Q.4 a)	Briefly explain column merging method in constructing the orthogonal array.	07
b)	Explain P-diagram.	07

Section –B

Q.5 a)	Write short note on: Modification of linear graphs.	06
b)	Explain Tolerance design strategy.	07
Q.6 a)	Explain ANOVA for an L8 OA.	07
b)	What are the steps in conducting a confirmation experiment?	06
Q.7	Explain confirmation experiment flowchart. How these decisions relate to each other.	13
Q.8	Write short note: (any two) 1. Advance strategy. 2. Replication of experiments. 3. Blocking two level designs.	14

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SUBJECT CODE NO:- K-8124
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Elective-II: Reliability & Maintenance Engg
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
      i) Use of non-programmable calculator is allowed.
      ii) Figures of the right indicate full marks.
      iii) Solve any three questions from each Section.

Section A

Q.1 a)   What do you understand by MTTF and MTBF? Explain the bath tub curve and discuss its importance.   07
    b)   Explain the terms reliability function, hazard rate and failure rate.   06

Q.2 a)   What is system reliability? How a reliability of the system can be increased?   08
    b)   Show for the exponential distribution that the residual mean life is $1/\lambda$ regardless of the lengh of time the system has been operating.   05

Q.3 a)   For   08

$$R(t) = e^{-\sqrt{0.001t}} \qquad\qquad t \geq 0$$

      a)   Compute the reliability for a 50 – hr mission
      b)   Show that the hazard for rate is decreasing
      c)   Give a 10-hr burn –in period; compute the reliability for a 50-hr mission.
      d)   What is the design life for a reliability of 0.95 given a 10-hr burn in?

    b)   Derive the expression of the Mode for the Weibull distribution.   05

Q.4 A)   Derive the various types of reliability systems.   09
      I.   Series
      II.   Parallel
      III.   Series Parallel
      Also mention its importance.

    B)   Discuss the need for maintenance and reliability.   04

Q.5   Write short notes on the following (Any Two)   14
      I.   Fault tree Analysis
      II.   Reliability Allocation
      III.   Economics of introducing standby or redundancy

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Section- B

Q.6   Derive the expression for optimal inspection frequency to profit maximizing.   13

Q.7   What are all the steps involved in preventive maintenance? Why preventive maintenance is better than   13
reactive maintenance.

Q.8   a)   What is wear debris analysis? What are the three wear debris analysis techniques commonly used and   08
compare their performance and uses?

    b)   How to carry out maintenance for the critical item?   05

Q.9   a)   Explain the RCM methodology.   07

    b)   What are the important considerations taken into account for performing reliability life testing?   06

Q.10   Write short notes on the following (Any Two)   14
      I.   Proactive Maintenance
      II.   Burn- in Testing
      III.   Block replacement policy

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SUBJECT CODE NO:- K-8127
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Elective-II: Manufacturing Management
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
 i) Attempt three questions from each section.
 ii) Question number 4and 8 are compulsory.
 iii) Figure to right indicate full marks.
 iv)Assume suitable data if necessary and state them clearly.

Section A

Q.1	a) Explain nature, scope and function of manufacturing management with examples.	08
	b) Explain "Quality Revolution" and role played by important contributors in the same.	07
Q.2	Elucidate road map for leading India towards world class manufacturing (WCM).	15
Q.3	a) Explain in details, concept of Just-in-Time manufacturing.	08
	b) Compare J.I.T with conventional manufacturing.	07

Q.4 Write short notes on <u>any two</u> of following.   10
  a) Role of TQM in WCM
  b) JIDOKA
  c) Eight pillar structure of TPM
  d) Push and pull system

Section-B

Q.5	a) What is GEMBA Kaiser? What is role played by "5 s" MUDA ANDON and SMED in it.	08
	b) Explain Kaiser Umbrella with examples.	07
Q.6	a) Which are key elements & supply chain management system? Explain with examples.	08
	b) Describe advanced planning and scheduling system and how it differs from conventional MRP system.	07
Q.7	a) Define lean manufacturing system. What are best tools of lean manufacturing system, explain with examples.	08
	b) Compare lean manufacturing with conventional manufacturing system.	07

Q.8 Write short notes on <u>any two</u> of following.   10
  a) PDCA cycle
  b) Production smoothing
  c) SMED
  d) Effect of implementing "Lean manufacturing system "on all organization.

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SUBJECT CODE NO:- K-8142
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Advanced Machining Science
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
i.   Attempt any three questions each section.
ii.   Figures to the right indicate full marks.
iii. Assume suitable additional data if necessary. Justify your assumptions.

Section A

Q.1   a)   In a turning experiment, following data has been noted.   08
            Uncut chip thickness, a_c = 0.25mm
            Chip thickness, a_0 =0.75mm
            Width of cut, a_w= 2.5mm
            Cutting force , F_c = 900N
            Thrust force, F_t = 450N
        Rake angle, $\propto$ = 0
        Calculate:
        i)   The mean angle of friction on the tool face, β.
        ii)   The mean shear strength of the material, τ_s.
      b)   Explain different types of tool wear in machining of metallic materials.   06

Q.2   a)   Derive the equation for determination of shear angle using experimental data.   07
      b)   Write down various important and desirable properties of cutting tool coatings. Explain the influence   06
           of these properties on tool life, tool wear and cutting forces.

Q.3   a)   Explain the role of the following parameters on machining performance measures such as cutting   10
           force, tool wear, and surface quality.
           I.   Speed of cutting.   03
           II.   Feed rate.
           III.   Depth of cut.
           IV.   Cutting fluid
           V.   Rake angle.
      b)   Why are carbide tools have –ve/zero rake angle while HSS tools are made with +ve rake angle?
           Explain.

Q.4   Write short notes on any three.   13
      I.   Carbide coatings,
      II.   Effects of strain rate,
      III.   Stress distribution along rake face,
      IV.   CNC machining.

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Section B

Q.5 **a)** Calculate the mean shear plane temperature rise during orthogonal machining with Zero rake. Given   **10**
specific energy = $1.5 J/mm^3$
$\mu = 0.8$, uncut chip thickness =0.2mm
 Chip thickness ratio, r=0.2

Density, ρ= 7000kg/m^3
Specific heat, c=500J/kg-$^\circ$C
ϑ= 2m/sec
Assume that 15% of the heat generated goes into the work piece.

b) What do you understand by ductile cutting of silicon? Explain.   **04**

Q.6 **a)** Graphite is the generally preferred material for EDM tooling. Would graphite also be appropriate for   **06**
wire EDM? Explain.

b) Compare wire EDM and grinding process with respect to the following
  I.   Surface integrity.   **06**
  II.   Fatigue life.
  III.   Machining cost.

Q.7 **a)** When the rake angle is zero during orthogonal cutting, show that   **10**
$P_S = F_C . v(1\text{-}\mu . r)$
Where,
P_S = specific Energy
F_C= cutting force
 r = chip thickness ratio,
μ = Coefficient of friction.

b) What is the purpose of abrasives in Electrochemical Grinding? Explain.   **03**

Q.8 Write short notes on any three.   **13**
  I.   nano - metric cutting.
  II.   Laser beam machining.
  III.   Heat in metal cutting.
  IV.   Micro-milling.

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SUBJECT CODE NO:- K-8160
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Advanced Joining Processes
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Q.No.1 and Q.No.6 are compulsory.
            ii) Solve inall three questions from each section.
            iii) Assume suitable data if required.

Section A

Q.1   Solve any two of the following.   12
            a) Explain the TIG. Welding process.
            b) Explain the seam welding process.
            c) Explain the weld defects.

Q.2   Explain with neat sketch of laser beam welding and also explain the advantage, disadvantages and application. 14

Q.3   Explain the different types of weld testing (Tensile, impact, hardness & corrosion).   14

Q.4   Explain the welding temperature
            a) Distribution for welding process   07
            b) Explain the weld solidification   07

Q.5   Write short note on (Any two)   14
            a) Electron Beam welding
            b) Weld design
            c) Weld cracking

Section – B

Q.6   Solve any two of the following.   12
            a) Explain the dye penetrate flaw detection.
            b) Explain the welding of plastic
            c) Explain the welder qualification

Q.7   Explain the x-ray & gamma ray radiation for welding.   14

Q.8   a) Explain the thermal inspection of welding process.   07
            b) Explain the eddy current testing.   07

Q.9   Explain the welding codes and standards.   14

Q.10   Explain the manufacturing pipe
            a) Procedure   07
            b) Explain the field welding & inspection   07

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SUBJECT CODE NO:- K-8066
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (CAD/CAM) Examination Oct/Nov 2016
Elective-III: Reliability Engineering & Life Testing
(Revised)

**[Time: Three Hours]**   **[Max.Marks:80]**

Please check whether you have got the right question paper.

i) Solve three questions from each question

N.B   ii) Q.No.1 from section A and Q.No.6 from section B are compulsory.

iii) Assume suitable data, if necessary.

Section A

Q.1		Solve any two of the following	12
	a)	Explain the bath tub curves.	
	b)	Explain Basic concept of reliability.	
	c)	Explain the failure theories.	
Q.2	a)	Define and Explain. MTTF, MTBF, failure rate and failure density.	07
	b)	Explain time dependent Hazard models.	07
Q.3		Explain redundancy, unit redundancy and standby redundancy also explain redundancy optimization.	14
Q.4	a)	Explain the tieset and cutset.	06
	b)	Find reliabiility of system shown in fig.1	08
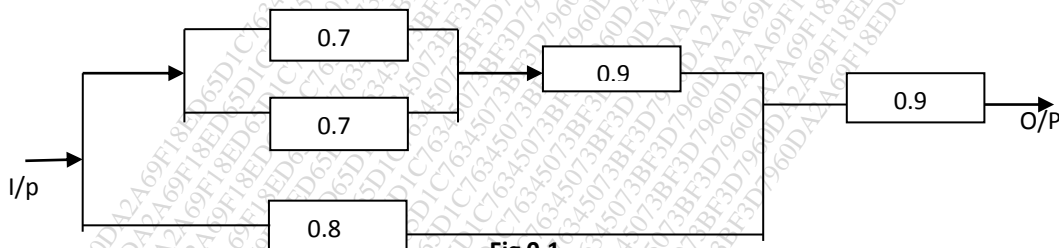
Fig 0.1

Q.5   Write short note on (Any Two).   14
a) Derating
b) FTA
c) RLD

Section B

Q.6		Solve any two of the following	12
	a)	Explain the objective of life tests.	
	b)	Explain the different types of reliability tests.	
	c)	Explain the life testing's.	
Q.7		Find the reliability of marine power plant using suitable reliability tools and techniques.	14
Q.8		Explain the accelerated life tests and basic methodology to conducting ALT. Also explain data quantification.	14
Q.9	a)	Explain the Eyring model.	07
	b)	Explain step stress methods for ASTS	07
Q.10		Write short note on (Any Two).	14
	a)	Advantages of HALT and Goals of HALT	
	b)	HASS	
	c)	Stress level for HALT	

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SUBJECT CODE NO:- K-8076
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Manufacturing Metrology & Quality Engg
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) Q.No.1 from section A and Q.No.5 from section B are compulsory.
             ii) Solve any two questions from section Q. No.2 to Q. No. 4 in section A and any 2rwoquestions from
             Q. No.6 to Q. No.8 in section B.

SECTION A

Q.1   Solve any three questions from the follows :-   18
       a)   What are types of Lasers? Five applications of each.
       b)   Explain Laser Doppler Technique.
       c)   Hour microscopic imperfections are detected on high quality surface?
       d)   Explain Rotating Mirror Laser scan technique.

Q.2   a)   What is the role of Laser interferometer in manufacturing?   06
       b)   How Laser is used in Calibration system for industrial robot?   05

Q.3   a)   What is Speckle Interferometry?   06
       b)   Explain high inertia Laser scan technique.   05

Q.4   a)   What is Rotating Mirror Laser scan Technique? Give its application.   06
       b)   Explain Pitter NPL gauge interferometer.   05

SECTION B

Q.5   Solve any three questions of the following :-   18
       a)   What are the hardware components of CMM?
       b)   What are Probe Sensors?
       c)   Explain Computer vision image analysis technique.
       d)   What is POKA-YOKE?

Q.6   a)   Compare Laser Scanning with vision system.   05
       b)   What is TQM?   06

Q.7   a)   How performance evaluation done by CMM?   06
       b)   How on-line and in process monitoring done by LCD in production?   05

Q.8   a)   What is digital image processing in vision system?   06
       b)   Explain Thermal Effect Diagram.   05

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SUBJECT CODE NO:- K-8178
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Computer Integrated Manufacturing
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B
  i) Solve any three questions from each section.
  ii) Figures to the right indicate full marks.
  iii) Assume suitable data wherever required and state it clearly.

Section A

Q.1	a)	Describe the need for CIM and the issues addressed by CIM.	05
	b)	Discuss the main elements of CIM systems.	08
Q.2	a)	Define local area network (LAN). Give its main features and explain its elements.	10
	b)	Explain automated guided vehicles.	03
Q.3	a)	What are the typical objectives of cellular manufacturing?	07
	b)	Explain types of machine cells and layouts.	06
Q.4	a)	Explain the concept of part families.	06
	b)	Discuss part classification and coding system.	07
Q.5		Write short note on: (<u>any two</u>)	14
	a)	Product flow analysis	
	b)	MRP and MRP II	
	c)	Communication matrix for CIM	

Section B

Q.6	a)	What are the building blocks of FMS? Explain.	06
	b)	Describe the architecture of a database management system.	07
Q.7	a)	Explain different FMS layouts.	08
	b)	Explain material handling systems in FMS.	05
Q.8	a)	Highlight the strategic benefits of CIM.	05
	b)	Explain in detail different database models.	08
Q.9	a)	Explain break even analysis in the context of CIM.	07
	b)	With suitable application elaborate the concept of E-commerce in the context of CIM.	06
Q.10		Write short note on the following. (<u>any two</u>)	14
	a)	Application of group technology	
	b)	Programmable logic controller	
	c)	Database file structure	

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SUBJECT CODE NO:- K-8197
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
Processing of Advanced Materials
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
        i) solve any three questions from each section
        ii).Assume suitable data wherever required
        iii) figure to right indicate full marks
        iv) draw a neat sketch wherever required

Section- A

Q.1   Forging process yields better properties in metal than casting or metal cutting. Explain the statement with   13
        example. also state the assumptions consider in theory of forging

Q.2   With example explain the concept of micromachining in detail, list different application of micro machining   13

Q.3   With a neat sketch explain the SLS process. State and explain in the effect of different process Parameters   13
        affecting process.

Q.4   Write short note on any two   14
        a)   manufacturing Automation
        b) AJM
        c) Factors conarning to RP

Section-B

Q.5   How is magnetic abrasive finishing done? State and explain the factor affecting the process also state its   13
        applications.

Q.6   Where and how compression molding is done? Explain, also explain extrusion molding.   13

Q.7   State the reasons for carrying out coating and with a neat sketch. explain the coating process carried on   13
        cutting tools

Q.8   Write short note on any two   14
        a) Electron beam machining
        b) Thermal metal spraying
        c) Injection molding

2016

SUBJECT CODE NO:- K-8222
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Manufacturing Engg.) Examination Oct/Nov 2016
El-1-Advanced Optimization Techniques
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
- I.   Attempt any three questions from each section.
- II.   Assume suitable data if required.

Section A

Q.1	a)	Describe optimal problem formulation procedure.	07
	b)	Explain local and global optimal points.	06

Q.2   Perform one iteration on the function $f(x) = x^2+54/x$ using interval halving method.   13

Q.3	a)	Explain Fibonacci search method.	07
	b)	Write down algorithm for successive quadratic estimation method.	06

Q.4   Identify the optimum points of the function $f(x) = x^3-10x-2x^2+10$.   13

Q.5   Use three iterations of the golden section search method in order to maximize the function.   14
$F(x)=10+x^3-2x-5 \exp(x)$ in the interval(-5,5)

Section B

Q.6	a)	What is direct search method? explain	07
	b)	Describe Evolutionary optimization algorithm.	06

Q.7	a)	Find whether the given direction S at the point X is descent for the functions.	07

$f(x_1,x_2) = x_1^4+ x_2^3-2x_1^2x_2^2+ 10x_1/x_2^2$,
$S=(-1,2)^T$, $x=(0,1)^T$

     b)   Locate and classify the stationary points for the function: 06
$F(x_1, x_2) =10(x_2-x_1^2)^2+ (1-x_1)^2$.

Q.8   Identify whether the followings NPL problem,   13
Minimize $x_1^2+x_2^2-10x_1+4x_2+2$
Subject to
$$X_1^2+x_2^2-6\leq0$$
$$X_2\geq x_1$$
$$X_1\geq0$$
Is optimal at point$(2,2)^T$

Q.9	a)	What is significance of sensitivity analysis?	07
	b)	Describe complex search method.	06
Q.10	a)	Describe genetic algorithm.	07
	b)	What is purpose of crossover and mutation?	07

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