

FACULTY OF ENGINEERING

B.E. 4/4 (M/P) II-Semester (Main) Examination, April / May 2013

**Subject : Modern Machining and Forming Methods
(Elective-III)**

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. What do you understand by non-conventional machining methods.
2. What are the types of abrasive materials and give their characteristics?
3. Define MRR. What are the variables affecting MRR?
4. Sketch schematic diagram of WJM.
5. Define over cut and side taper in EDM.
6. What are the functions and characteristics of electrolyte in ECM?
7. What are the advantages of hot machining?
8. What are the types of materials used for LBM production?
9. Differentiate between spinning and flow forming.
10. What is the effect of stand off distance in explosive forming?

PART – B (5x10=50 Marks)

- 11.(a) Explain the effect of process parameters on MRR and surface finish the USM.
(b) Discuss the advantages, limitations and application of water jet machining.
- 12.(a) Explain the principle and working of EDM with a neat sketch.
(b) Discuss the limitations and characteristics of ECM.
- 13.(a) What do you understand by the term LASER? How is a laser beam produced?
(b) Explain and give applications of ION etching process.
- 14.(a) Differentiate between Rubber pad forming and hydro forming.
(b) Explain the principle and limitations of contact type of explosive forming process.
- 15.(a) Differentiate between stretch draw forming and rotary stretch forming.
(b) Explain the working principle, process variables and applications of WHF.
- 16.(a) Explain the principle of hydrostatic forming process with help of a neat sketch.
(b) Explain the principle and application of AJM.
17. Write short notes on the following:
 - (a) Plasma Arc Machining (PAM)
 - (b) Tube spinning
 - (c) Electron Beam Machining (EBM)

FACULTY OF ENGINEERING**B.E. 4/4 (M/P) II-Semester (Main) Examination, April / May 2013****Subject : Product Design and Process Planning
(Elective-III)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. Write about Design by evolution and Design by innovation.
2. Discuss about the need for creativity and innovation.
3. What is risk factor in a project?
4. Define Ergonomics and explain man-machine information exchange.
5. Write various factors which can be attributed for success or failure of a product.
6. Define patents and write the importance of taking a patent.
7. Write about various parameters to be considered in selecting a right manufacturing technique.
8. Write the various steps to be followed for releasing a new product.
9. Differentiate between cost control and cost reduction.
10. Define value of appearance and state the laws of appearance.

PART – B (50 Marks)

11. What is product design and explain various phases in product design? (10)
12. What is project and explain life cycle of the project? (10)
13. What is product life cycle and explain various stages of product life cycle? (10)
14. Explain the steps to be followed to introduce a new product and what are the methods of launching a new product. (10)
15. Differentiate between cost reduction and cost control, and explain how manufacturing cost is estimated. (10)
- 16.(a) What are the inventions / designs that cannot be patented? (5)
(b) Define and explain process planning. (5)
17. Write short notes on the following: (5+5)
(a) Intellectual Property Right
(b) Concurrent engineering

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B.E. 4/4 (M/P) II-Semester (Main) Examination, April / May 2013

**Subject : Rapid Prototyping Technologies
(Elective-III)**

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Explain commonly used terms of RPT.
2. What is post processing in RPT?
3. Explain laser technology.
4. Explain case studies of SGC.
5. List LOM specification
6. List FDM models
7. Enumerate the applications of SLS process
8. Limitations of 3DP
9. List art models
10. What are functional models?

PART – B (5x10=50 Marks)

- 11.(a) Classify RP process and enumerate the advantages and disadvantages of RPT.
(b) Explain 3D modeling and its interaction with RPT.
- 12.(a) Explain the working principle of photo polymerization and layering technology.
(b) What are the advantages, disadvantages and applications of SLA process?
13. Describe the working principles of SGC with case studies and advantages and disadvantages.
14. Describe the working principle with a neat sketch the LOM and FDM process.
15. Explain SLS process along with the materials used and advantages and limitations of the process with examples.
16. What is 3DP? Explain the models, specifications and working principle of 3DP with case studies.
17. Describe the applications of RPT with reference to
(a) Medical Models and Engineering analysis models and
(b) the pattern for investment and vacuum casting profess.

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B.E. 4/4 (ECE./M/P/Inst) II-Semester (Main) Examination, April / May 2013

Subject : Robotics
(Elective-III)

Time : 3 Hours

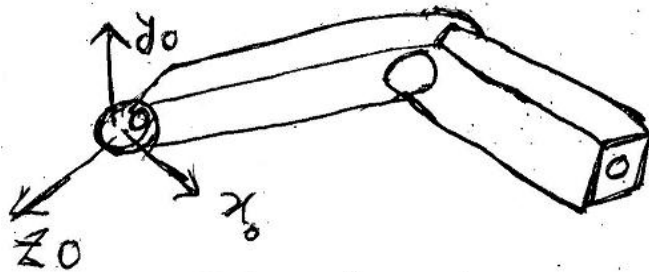
Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.**PART – A (25 Marks)**

1. Classify Robots based on the following: (3)
(a) Power source (b) Method of control (c) Kinematics
2. Differentiate between 'Revolute Joint' and 'Spherical Joint' with a neat sketch. (2)
3. Mention any two differences between an Integral controller and a differential controller. (2)
4. Define the terms 'Proximity' and 'Range' related to Robotics. (2)
5. Mention how serial manipulators are different from parallel manipulators. (3)
6. What are the various constraints to be taken into consideration during trajectory planning? (3)
7. What is the need of programming a Robot? Write a brief note about the programming language 'AML'. (3)
8. Write a short note on hydraulic drive used in Robots. (2)
9. Enumerate any two differences between Direct and Inverse kinematics. (2)
10. What is the significance of redundant degrees of freedom in Robot manipulators? (2)

PART – B (50 Marks)

11. Two points (a_{uvw}, b_{uvw}) given by, $a_{uvw} = (4, 3, 2)$ and $b_{uvw} = (6, 2, 4)^T$ with respect to 'OUVW' coordinate system. Determine the corresponding a_{xyz}, b_{xyz} with respect to the reference coordinate system, if it has been rotated 60° about OZ axis. (10)
12. Discuss the different steps involved in the link coordinate system (DH coordinates) assignment algorithm. (10)
13. A two degree of freedom manipulator is shown in figure below. If the length of each link is 1m, establish its link coordinate frames and find O_{A1} and 1A_2 . Find the inverse kinematic solution for the manipulator. (10)



14. A serial manipulator with two links ($l_1 = l_2 = 4m$) is used to draw a sketch on a plane wall. The current position of the pencil fixed to the end effector is at the point $P(3, 5)$. Find out the Joint parameters for the current position of the manipulator. (10)
- 15.(a) Define the term Jacobian of a Robot manipulator. (3)
(b) A certain two link manipulator has the following Jacobian

$$O_{J(\theta)} = \begin{bmatrix} (-J_1 S_1 - J_2 S_{12}) & (-l_2 S_{12}) \\ (l_1 C_1 + l_2 C_{12}) & (l_2 C_{12}) \end{bmatrix}$$
 Ignoring gravity, determining the joint torques, required so that the manipulator apply a static force vector ($O_F = 10\hat{X}_0$). (7)
- 16.(a) Mention any four Robot driving technologies along with their applications. (4)
(b) Describe the strategies used to control Robots. Explain computed torque Technique in detail. (6)
- 17.(a) Explain in detail the working principle of an ultrasonic proximity sensor. (5)
(b) What is meant by machine vision? Why do we use machine vision methods in Robotics? (5)

FACULTY OF ENGINEERING**B.E. 4/4 (EEE/Inst./M/P) II-Semester (Main) Examination, April / May 2013****Subject : Internet Programming
(Elective-III)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. Write HTML tags to manage Hyper link with tips with a suitable script. (3)
2. How internet explorer is different from other browsers with respect to Active X controls? Explain. (3)
3. Compare Java with C++ with respect to programming problems. (3)
4. How function overriding is managed in Java? (3)
5. How virtual functions of C++ are defined or managed in Java? (3)
6. What is the job of a package in Java? How to define it? (2)
7. What is the Job of a Run time Environment of Java? (2)
8. What is DNS? (2)
9. What is work flow software? (2)
10. What is the Job of JDBC? (2)

PART – B (50 Marks)

11. Using suitable Database, ODBC and JDBC explain how a password is verified in webpage. (10)
12. Write Java Applet to compute Root of a Quadratic equation. Show HTML script also. (10)
13. How to represent a matrix in Java code? Write a procedure to compute transpose of a matrix? (10)
14. How Exception is handled in Java? Explain with a code segment. (10)
15. What are AWT controls? How to use them? Explain. (10)
16. How to build a chat server? Explain implementation issues. (10)
17. Write short notes on the following: (10)
 - (a) News servers
 - (b) FTP servers

FACULTY OF ENGINEERING**B.E. 4/4 (M/P) II-Semester (Main) Examination, April / May 2013****Subject : Fuels and Combustion
(Elective-III)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. Write the classification of coal.
2. What is manufactured fuel and explain the agro fuels?
3. Explain the petroleum distillation process.
4. Describe the source, major composition and calorific value of
(i) coal gas (ii) coke oven gas (iii) Blast furnace gas
5. Explain the necessity of excess air for burning fuels.
6. Calculate the theoretical air required for the complete combustion of 1kg of the following:
(i) Carbon (ii) Carbon monoxide
7. Describe the theory of flame propagation.
8. Explain any one method of flame stabilization.
9. What are the effects of direct burning of edible oil in diesel engines?
10. Write the advantages and disadvantages of the use of LPG petrol engines.

PART – B (5x10=50 Marks)

- 11.(a) Describe the method of determination of heating of coal.
(b) Describe the coal gasification process.
- 12.(a) The percentage composition of a sample liquid fuel by weight is : C = 84.8% and Hydrogen = 15.2%. Calculate (i) The weight of air need for combustion 1 kg of fuel. (ii) Volumetric analysis of the products of combustion, if 15% excess air is supplied. (7)
(b) Describe the method of storage and handling of liquid fuels. (3)
- 13.(a) The volumetric analysis of a fuel gas is CO₂ = 14%; CO=1%; O₂=5% and N₂ = 80%, calculate the fuel gas composition by weight.
(b) What is the difference between higher heating value and lower heating value of fuels?
- 14.(a) Describe autoignition process.
(b) Describe the design consideration of coal, oil and gas burners.
- 15.(a) Describe the methods of conversion of edible oils for use in diesel engines.
(b) Discuss the features and limitations of the use of Hydrogen in petrol engines.
- 16.(a) Describe the working of Junkers gas calorimeter.
(b) Describe the conversion of volumetric analysis to weight analysis and weight analysis to volumetric analysis.
17. Write short notes on the following: (10)
(a) Combustion in SI engines
(b) Theoretical flame temperature calculations
(c) Methods of measurement of burning velocity