UTILAZTION OF ELECTRICAL ENERGY
EE-414-E

L	T	P		Sessional:	50 Marks
3	1	-		Theory :	100 Marks
				Total :	150 Marks
				Duration:	3 Hrs.

UNIT 1
Illumination: Term used in illumination, Law's of illumination, sources of Light, arc lamp incandescent lamp, discharge lamp, sodium vapour, mercury vapour lamp,florescent tubes, lightening schemes, method of lightning calculation.

UNIT II
Electrical Heating: Advantages of Electrical Heating, various types of Electrical heating, Power frequency and High frequency heating, Degree of heating element, Equivalent circuit of arc furnace, Resistance heating, Arc heating, Induction heating, dielectric heating etc.

Electric Welding: All types of electrical welding, resistance welding, arc welding, electrical winding equipment, Comparison between AC & DC welding, types of electrodes, advantages of coated electrodes.

UNIT III
Electroplating: Basic principle, faraday's law of electrostatics, terms used, Application of electrolysis, factors governing electro deposition, power supply.

Refrigeration & Air Conditioning: Basic principle, various compression cycle & system its application, electric circuit of refrigerator, air conditioner.

UNIT IV
Traction Motors : Different system of electric traction, comparison between AC & DC system, block diagram of traction system ,Starting-Speed control and braking- Speed control and braking –Speed time curves,-Mechanics of Train movement-Tractive effort for acceleration – Power and energy output from driving axles-Specific energy
output and consumption-Train resistance.

NOTE: The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

References:
1. Dr.S.L.Uppal, Electrical Power ,Khanna Publishers, New Delhi,1980.
2. M.L.Soni,P.V.Gupta,U.S.Bhatnagar,A.Chakrabarti,A Text Book On Power
System Engineering, Dhanpat Rai & Co,New Delhi1997-98
3. H.Pratap, Art and Science of Utilization of Electric Energy, Dhanpat Rai & Sons,
New Delhi,1980.
4. G.C.Garg, Utilization of Electric Power and Electric Traction, Khanna publishers,
New Delhi,1995.

COPUTER METHODS IN POWER SYSTEM
EE-402-E

L	T	P		Sessional:	25 Marks
4	1	-		Theory :	75 Marks
				Total :	100 Marks
				Duration :	3 Hrs

UNIT-1

General: Impact of computers, orientation of engineering problems to computers, review of matrices and matrix operations.

Incidence and Network Matrices: Network graph, various incidence matrices, generalized element representation, primitive network and primitive network matrices, formation of various network matrices by singular transformations, inter- relations between various incidence matrices and network.

UNIT-2

Bus Impedance and admittance matrices: Building algorithms for bus impedance matrix, modification of bus impedance matrix for change of reference bus and for network changes, formation of bus admittance matrix and modification of three-phase network elements, treatment under balanced and unbalanced excitation, transformation matrices, and unbalanced elements.

UNIT-3

Short-Circuit Studies: Introduction, network short circuit studies using Z bus, short circuit calculations using symmetrical components for various types of faults.

Load-Flow Studies: Introduction, importance of load flow studies, classification of buses, load flow equations, iterative methods, computer algorithms and load flow solutions using Gauss Seided and Newton Raphson methods, decoupled and fast decoupled load flow solutions, representation of regulating and off nominal ration transformers, comparison of load flow solution methods.

UNIT-4

Sparsity: Introduction, optimally ordered triangular factorization, schemes of optimal ordering Stability Studies: Algorithms flow chart and transient stability solution using modified euler method.

Power System Security: introduction, contingency analysis using Z bus and various distribution factors.

NOTE: The question paper shall have eight questions in all organized into four sections, Each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

Suggested books:
1. Glenn W.Stagg and Ahmed EI-Abiad, "Computer Methods in Power System Analysis", McGraw Hill.
2. George L.Kusic, "computer-Aided Power Systems Analysis", PHI.
3. John J Grainger and William D. Stevenson, " Power System Analysis", Jr. McGraw Hill.
4. IJ Nagrath and D.P. Kothari, "Power System Engg.", Tata McGraw Hill

ELECTIRCAL ENGG. MATERIALS AND PROCESS
EE-404-E

L	T	P			Sessional:	50 Marks
3	0	-			Theory :	100 Marks
					Duration:	3 Hrs

UNIT-1
Conductors, Properties of conductors, ACSR, High resistivity materials and their properties, Alloys, Soldering and brazing materials, superconductivity, super conductor materials and their applications.

UNIT-2
Insulators, classifications of insulators, dialectical materials, glass and ceramics refractory materials and their uses, optical fibers, laser and opto-electronics materials, semiconductor materials, properties of semiconductor materials thermosetting and thermoplast materials.

UNIT-3
Classification of material, Dia, Para, and Ferro magnetic materials-curie law and curie Weiss law (qualitative study). Ferromagnetism-Qualitative study of domain theory – Hystersis phenomena. Hard and soft magnetic material and their applications. Ferrites, Structure and property.

UNIT-4
Processes used in Plano technology e.g. Lapping, polishing, cleaning, masking, photolithography, diffusion, oxidation and metallization, welding wire bonding, packaging and encapsulation, Heating induction and dielectric, Electron beam welding and cutting ammealing, cold &Hot rolling.

NOTE: The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

Reference Books:
1. Kasap S.O   Principles of Electrical Engg. Material and Devices (MGH).

2. Mahajan   Principles of Growth and processing of semiconductors (MGH).
3. Dhir   Electronics components and materials and Principles Manufacturing & Maintenance
4. Addision   Electronics Engg. Material Devices (TMH)
5. Ruska N Scot Microelectronics processing and introduction to the manufacturer of integrated circuits (MGH).
6. Seth & Gupta A course in electrical Engg. Material (Dhanpat Rai & Sons).
7. Dekker   Electrical Engg. Materials (PHI).

OPERATION RESEARCH
EE-406-E

L   T   P
4   1   -

Sessional: 50Marks
Theory :   100 Marks
Duration :   3 Hrs

UNIT-1
Development of operation research, characteristics and scope of operation research, operation research in Management, model in operation research, model formation, types of mathematical models, limitation of operation research.
L.P. models, simplex method, the algebra of simplex method, (Minimization problems), the big M method, post optimality analysis, essence of duality theory, Application of sensitivity analysis.

UNIT-2
Introduction to model, matrix terminology, formulation and solution of Transportation model (least cost method, Voyel's Approximation method), least time transportation problem, Assignment problems.
Introduction to net work logic, Numbering of events (Fulkerson Rule), PERT calculation Forward Path, back-ward path, Slack, probability, comparison with PERT, Critical path, Floats, Project cost, crashing the net work, updating (PERT and CPM)

UNIT-3
Introduction, applications of simulation, advantages and limitations of simulation techniques, generation of random numbers, Time-flow mechanism, simulation languages.
Steps in decision theory approach, Decision Machinery environment, Decision machining under certainly and uncertainly, Decision machining under condition of risk, Decision trees, minimum enchained criteria, advantage and limitations of decision tree solutions, post optimality, Definition of arguments models, comparison with transport model, Mathematical representation of assignment model, Formulation and solution of argument models, variation of the argument model, Alternate optimal solutions.
UNIT-4
Introduction, Applications of queuing theory, waiting time and idle time costs, single channel queuing theory and multi channel queuing theory with Poisson, arrivals, and exponential services, Numerical on single channel and multi channel queuing theory.
Theory of games, competitive games, Rules and terminology in game theory, Rules for game theory- saddle point, dominance, mixed strategy(2x2games), mixed strategy (2x n games or m x 2 games), mixed strategy (3x 3 games), two person zero sum games, n-person zero sum games.

NOTE: The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

Reference and Text books:
1.   Introduction to operation research- by Hillier and Lieberman, McGraw Hill.
2.   Operations Research – by P.K. Gupta and D.S Hira.
3.   Linear Programming by N.P. Loomba.

INTERNET FUNDAMENTALS
EE-416-E

L   T   P
4   1   -

Sessional: 50 Marks
Theory :   100 Marks
Total   :   150 Marks
Duration: 3 Hrs

Unit-1
The Internet: Introduction to networks and internet, history, internet, intranet & extranet, working of internet, internet congestion, internet culture, business culture on internet. Collaborative computing & the internet. Modes of connecting to internet, internet service providers(ISPs), internet address, standard address, domain name, DNS, IPv6, modems, speed and time continuum, communication software: internet tools.

UNIT-2
World Wide Web: Introduction, Miscellaneous Web Browsers details, searching the www: directories search engines, and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP, HTTP, Gopher commands, TCP/IP.
Introduction to Browser, Coasst-to-ocaost surfing, hypertext markup language, web page installation, web page setup, Basics of HTML & formatting and Hyperlink creation. Using Front Page Express, plug-ins.

UNIT-3
Electronic Mail:
Introduction, advantages and disadvantages, User IDs, Passwords, E-mail addresses, message components, message compositions, mailer features, Email Inner working, Email management, MIME types, newsgroups, mailing lists, chat rooms, secure-mails, SMTP, PICO, Pine, library, cards catalog, online ref. works.
Languages: Basics and advanced HTML, Basics of scripting languages- XML, DHTML, Java Script.

UNIT-4
Servers: Introduction to Web Servers: PWS, IIS, Apache: Microsoft Personal Web Server. Accessing & using these servers.
Privacy and security topics: Introduction, Software Complexity, Attacks, Security and privacy levels, security policy, accessibility and risk analysis, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Intrusion Detection Systems.
NOTE: The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

Reference:
1.   Fundamentals of the Internet and the World Wide Web, Reymond Greenlaw and Ellen Hepp-2001, TMH.
2.   Internet & World Wide programming, Deitel, Deitel & Nieto, 2000, pearson Educatiion.
3.   Internet Fundamentals – Shubhra Garg, Ishan pub.
4.   Complete Idiots guide to java script, Aron Weiss, QUE, 1997.
5.   Network Firewalls, Kironjeet Syan, New Rider Pub.
6.   Networking Essentials- firewall Media.

L	T	P		Sessional:	25marks
0	0	3		Theory:	25marks
				Total:	50 marks

Pre-requisite: Application of basics of MS World 2000, MS Excel 2000, Ms Power Point ,MS Access 2000**.**

LIST OF EXPERIMENTS:
1. To prepare the your Bio Data using HTML Tags.
2. Create a new document that takes the format ofa business letter. Combine <P> and <BR> tags to properly separate the different parts of the documents. Such as the address, greeting, content and signature. What works best for each.
3. Create a document that uses multiple <BR> and <P> tags, and put returns between <PRE> tags to add blank lines to your document see if your browser sender them differently.
4. Create a document using the <PRE> tags to work as an invoice or bill of sale, complete with aligned dollar values and a total. Remember not to use the Tab key, and avoid using emphasis tads like <B> or <EM> within your list.
5. Create a seven items ordered list using Roman Numerals. After the fifth item, increase the next list value by 5.
6. Beginning with an ordered list, create a list that nests both an unordered list and a definition list.
7. Use the ALIGN attribute of an <IMG> tags to alling another image to the top of the first image, play with this feature, aligning images to TOP, MIDDLE and BOTTOM.
8. Create a Table fo Contents, Style page (using regular and section links) that loads a different document for each chapter or section of the document.
9. Create an HTML document to print the college time table using table tag.
10. Write the HTML code for implementing the form.
11. Create few HTML docs for each explaining about a state of India. The list of state must appear in a frame when we click on state, the details must appear in another frame.
12. Design Web Pages containing information of the Deptt using HTML tags & CSS.
13. Installing internet & external nodems (External & internal), NIC and assign IP address.
14. (a) Study of E-Mail system & various mail options. (b) Create your own Mial0ID in yahoo & add your signature. (c) Add names (mail-IDs) in your address books, compose and search an element.
15. Study the use of Meta Tags in the development of web page.

Note: At least 10 programs are to be performed from above list.

EE–418–E   COMPUTER METHODS IN POWER SYSTEM LAB

L	T	P			
0	0	3	Sessional:	25marks
			Theory:	25marks
			Total:	50 marks

Pre-requisite: Perform the experiments using C/C++ Language.

List of Experiments:
1. Develop a program to do the following mathematical operations:
    i) Transpose of a matrix
    ii) Multiplication of two matrices
    iii) Addition & subtraction of two matrices.
2. The demand estimate is the starting point for planning the further electric power Supply. Mathematical curves of the trend. One of the simplest curve is P= Po exp {a (t-t0)}, where a is the average per unit growth rate
    P is the demand in year 't' in GW
    P0 is the given demand at year T0 in GW.
    Develop a table to compute the system demand from 1984 to 2005 on yearly basis. Calculate also the average yearly demand over this period.
3. You have been given with network data consisting of element no. starting node & End node. Develop a program to make element node incident matrix. A and convert It into Ybus as incidence matrix. A by choosing any bus as reference.

Element No.	Starting Node	End Node
1	1	2
2	1	6
3	2	3
4	3	4
5	4	5
6	6	5
7	1	5
8	3	5

4. Write a program to formulate Y-Bus by non singular transformation Y Bus = [A] T[y] [A].
5. Develop a program to solve a set of 4 simultaneous liner equations using Gaussian Elimination method.
6. Develop a program to calculate Zbus of a given network using building algorithm. Assume that no mutual coupling is involved in between the different elements.
7. The Gauss Seidel method to find the solution of following equations
    $$X1 + X1X2 + X3 = 10$$
    $$X1 + X2 + X3 = 6$$
    $$X1 X2 - X3 = 2$$
8. You have given with a 6 bus system. Apply load flow technique using Gauss Seidel method to solve up to two iterations.
9. Develop a program to find Eigen Values for given Matrix.

Note: At least 10 programs are to be performed from above list.