PANJAB UNIVERSITY, CHANDIGARH-160014(INDIA)
(Estd. under the Panjab University Act VII of 1947-enacted by the Govt. of India)

FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABI

AND THE

REGULATIONS

FOR

Bachelor of Engineering MBA (Electronics & Communication)
Third-Eighth Semesters
Examinations, 2013-2014

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### Third Semester

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No marks are assigned to summer training (EC 563) work. On successful presentation and completion of these courses the candidate will be awarded “S” grade i.e. satisfactory or else “X” grade i.e. unsatisfactory.

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No marks are assigned to project –I(EC 766), seminar-I(EC765) and summer training (EC 767) work. On successful presentation and completion of these courses the candidate will be awarded “S” grade i.e. satisfactory or else “X” grade i.e. unsatisfactory.

**Elective – I**

- EC711 Operating Systems
- EC712: Radar Engineering
- EC713: Web Technologies
- AS 701: Cyber Laws & IPR
Eighth Semester

### Option -1

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No marks are assigned to Design Lab(EC 866) and seminar-II(EC865) work. On successful presentation and completion of these courses the candidate will be awarded “S” grade i.e. satisfactory or else “X” grade i.e. unsatisfactory.

**Elective – II and Elective III (Any Two):**
- EC808: Digital Image Processing
- EC809: Advanced Digital Communication
- EC810: Neural Networks & Fuzzy Logic
- EC811: Embedded System Design
- EC813: Analog & Mixed Signal Design

**Elective-IV and Elective V (Any Two):**
- EC814: MEMS and Microsystems
- EC815: Artificial Intelligence
- EC816: Operation Research
- EC817: Nano Technology
- EC818: Satellite Communication
- EC819: Research Methodology
OPTION - 2

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In 8th semester, student can exercise **Option 1 or Option 2** according to the following conditions:

A student may opt for one semester training in lieu of subject of 8th semester. The marks for six months training will be equal to the total marks of 8th semester study. A student can opt for six months semester training under following conditions:

a. The student got selected for the job in campus placement and the employer is willing to take that student for the training.

b. The student got offer of pursuing training from reputed research organization/ govt. sponsored project/govt. research institution provided that student should not be paying any money to get trained. For pursuing this training student need the prior approval from the chairperson/coordinator of the respective department/ branch.
**NINTH SEMESTER**

STUDENTS ARE OFFERED 4 SPECIALIZATIONS : Marketing, Human Resource (HR), Information Technology (IT) and Finance. Students have to select 2 specialization areas. They will then study 3 subjects in each of the specialization area they select. The students will thus study 8 subjects in IX sem (3 + 3 + 2 compulsory)

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<tr>
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<td>908</td>
<td>Elective (Finance)</td>
<td>Strategic Financial Management</td>
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<td>3</td>
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<tr>
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<td>909</td>
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<tr>
<td>15</td>
<td>915</td>
<td>Compulsory Summer training after VIII Semester</td>
<td>Summer Training Six – Eight weeks</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>200</td>
</tr>
</tbody>
</table>

* Internal sessional marks breakup will be: 2 sessionals of 25 marks each (student has to appear in one session, he/she can appear in both - the best of one will be selected) + surprise test/quiz/presentation for 15 marks + 10 marks for attendance
**TENTH SEMESTER**

In the X semester the students will study 2 subjects each in the area of specialization areas they have selected in the IX semester. The students will have 7 subjects in X sem (2 + 2 + compulsory + seminar + minor project)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Course No</th>
<th>Course Type</th>
<th>Course Title</th>
<th>Hours / week</th>
<th>Credits</th>
<th>University External Marks</th>
<th>Internal Session Marks*</th>
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<tr>
<td>1</td>
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<td>Data Warehousing &amp; Data Mining</td>
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<td>-</td>
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</tbody>
</table>
* Internal sessional marks breakup will be : 2 sessionals of 25 marks each (student has to appear in one sessional, he/she can appear in both -the best of one will be selected) + surprise test/quiz/presentation for 15 marks + 10 marks for attendance.
THIRD SEMESTER

Paper Title: Analog Electronic Circuits-1 (Theory)

Paper Code: EC 316  Max. Marks/ Credit: 50/4  Time: 3 hours

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A

Switching Characteristics of Devices:  [7]
Diode and transistor as electronic switch, Breakdown mechanism in diode, Effect of temperature on diode, Charge storage phenomena, Switching times in diode and transistor, Delay time, Rise time, Storage time and fall time.

Low & High Frequency Transistor Model:  [6]
Transistor at low frequency, Transistor hybrid model, $H$–parameters, conversion formulas, analysis using $h$–parameters, cascading transistor amplifiers, transistor at high freq. and its hybrid (pi), CE model.

Review of Transistor Biasing and stabilization:  [8]
Operating point, Bias stability, various biasing circuits, stabilization against variation in $I_{co}$, $V_{be}$ and beta, Bias compensation, Thermister and Senistor compensation, Thermal Runaway, Thermal stability, biasing the FET, FET as a VVR, CS amp. at high freq., CD amp at high freq.

Multistage or Cascaded Amplifiers:  [6]
Classification of Multi-stage Amplifier, Types of coupling, Effect of cascading on voltage gain, Current gain, Phase, Input and output impedances and bandwidth Analog of cascaded or multistage amplifiers, Cascade and Cascade circuits, Miller Theorem, Darlington pair, Bootstrap Circuits.

PART B

Feedback Amplifiers:  [6]
Concept of feedback, Positive and negative feedback, Voltage and current feedback, Series and shunt feedback, Effect of feedback on performance characteristics of an amplifier.

Tuned Amplifiers:  [4]
Single tuned and doubles tuned and their frequency response characteristics.

Power Amplifiers:  [8]
Classification of amplifiers, analysis of class A, B, C and AB amplifiers, push pull amplifier, complementary symmetry and paraphrase amplitude distortion in amp., Frequency response of amp., its graphical analysis, Harmonics, power distortion, heat sinks.

Recommended Books:
1. Electronics Circuit Analysis and Design by Donald A. Neamen, Tata McGraw Hill
2. Integrated electronics by Millman & Halkias, TMH, Latest Edition
3. Pulse and Digital Switching Circuits by Milliman, Taub; Tata McGraw Hill
6. Pulse and Switching Circuits by Sanjeev Kumar; Dhanpat Rai & Company

**Paper Title:** Analog Electronic Circuits-1 (Practical)

**Paper Code:** EC 366  
**Credit:** 1

**List of Experiments**
1. To draw the characteristics of Transistors
2. To draw the characteristics of FET.
3. To draw the frequency response of a single stage BJT amplifier.
4. To measure the voltage and current gain of a BJT amplifier.
5. To measure the distortion in the output of a push pull amplifier.
6. To study the Pspice Simulation software
8. Frequency response analysis of Tuned amplifiers.
10. SCR Characteristics.

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**ORGANIZATION BEHAVIOR**

**Course:** BE-MBA  III th Semester  
**Max Marks/credit:** 50/3

**Paper – Compulsory**

**Paper Code:** IBM- 301  
**Time:** 3 Hours

**Course Duration:** 45 Lectures of one hour each.

**Note:** The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

**Objectives:** To introduce the student to the concept of human behavior and also organization behavior. Important concepts like perception, leadership, motivation etc are introduced to build a foundation for understanding organization working environment.

**Internal Assessment:** 50  
**External Assessment:** 50

**Part-A**
Perception: Factors Influencing perception- perceptual selectivity Linkage between perception and Individual decision making-ethics in decision making. (4)

Personality and Emotional Quotient (EQ): The meaning of personality, its determinants-personality Traits; The big five model, Emotional quotient. (5)

Motivation & Morale: Concepts to Applications. (2)


Part-B


Power & Politics: Definitions of Power-Distinction between Power and Authority-Bases of Power-Power Structure and Block, Impression management-political behavior in organizations. (6)

Conflict & Inter Group Behavior & Collaboration: Sources of Conflict, Intra-individual Conflict, Interpersonal Conflict, Inter-group behavior and Conflict, Organizational Conflict, Negotiations-Approaches to Conflict Management-Collaboration. (5)


References
1. Behavior in Organizations ,Greenberg, Baron , PHI
3. Organization Behavior ,Fred Luthans , TMH

Paper Title: Network Synthesis & Filters Design (Theory)

Paper Code: EC 318 Max. Marks/ Credit: 50/4 Time: 3 hours

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.
PART A

Circuit Concepts: [3]
Circuit elements, Independent and dependent sources, signals and waveforms, periodic and singularity voltages.

Mesh & Nodal Analysis: [5]
Loop currents and loop equations, node voltages and node equations, mesh and nodal analysis, duality, graphical method of determining the dual of N/Ws.

Network Theorems: [5]
Superposition, Thevenin’s, Norton’s, Maximum power Transfer, Tellegen’s, Reciprocity theorem.

Networks functions: [10]
Concept of complex frequency, Transform Impedance and transform circuits, Network functions for the one port and two port, Calculation of network functions, Poles and Zeros for Network functions, Restrictions on Poles and Zeros, Locations for Driving Point and Transfer functions, Time domain behavior from Pole and Zero plot, Stability of networks functions.

PART B

Two Port Network: [6]
Relationship of Two port variables, Short Circuit Admittance and Open circuit Impedance parameters, Transmission and hybrid parameters, Network Topology and Graph Theory.

Filter Synthesis: [10]
Classification of filters, characteristic impedance and propagation constant of pure reactive network, Ladder network, T–section, Pi–section, terminating half section, Pass bands and stop bands, Design of constant–K, m–derived filters. Composite filters.

Driving point admittance function: LC Network (Foster and Cauer forms); Driving point admittance and impedance function: RL & RC Network (Foster and Cauer forms).

Recommended Books
1. Networks and Systems by Ashfaq Hussain
2. Network Analysis and Synthesis by D.R.Chaudhry
8. Network Analysis by M.E. Van Valkenburg (PHI), Edtion 3+0RD.

Paper Title:- Network Synthesis & Filters Design (Practical)

Paper Code: EC368
Credit: 1
Experiments covering

**Implementation and proof of**
Superposition Theorem, Thevenin’s Theorem, Norton’s Theorem, Maximum Power Transfer Theorem, Reciprocity Theorem.

**Study of transfer characteristics of**
Low Pass Filters, High Pass Filters, Band Pass Filters, Band Stop Filters

**Design and implementation of**
Constant–k, m–derived, and Composite filters.

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**Paper Title:** - Digital Electronics (Theory)

**Paper Code:** EC 314  
**Max. Marks/ Credit:** 50/4  
**Time:** 3 hours

**Course duration:** 45 lectures of one hour duration each

**Note:** The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

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**PART A**

**Introduction**  
[10]

**Flip-Flops**  
[4]
A 1-bit memory cell, clocked & unclocked flip flop, S-R Flip-Flop, JK Flip-Flop, Race around Condition, Master Slave Flip-Flop, D & T type Flip-Flop, Excitation table of Flip-flops, Conversion of flip-flops

**Counters & Shift Registers**  
[8]
Design with state equations, Ripple Counters, Design of Modulo-N Ripple counter, Presettable Counters, Up-Down counter, Design of synchronous counters with and without lockout conditions, design of shift registers with shift-left, shift-right & parallel load facilities, Universal shift Registers

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**PART B**

**Data Converters**  
[6]
Sample & Hold switch, D/A converters: Weighted resistor type, R-2R Ladder type, Modified weighted resistor type; A/D Converters: Flash type, Successive Approximation type, Counter-Ramp type, Dual Slope Type; Specifications of ADC & DAC

**Digital Logic families**  
[8]
Characteristics of digital circuits: fan in, fan-out, power dissipation, propagation delay, Noise Margin, Transistor-transistor Logic (TTL), Types of TTL Gates (Schottky, Standard, low power, high
speed), Tristate Logic & its applications, Emitter Coupled Logic (ECL), CMOS, Comparison of characteristics of TTL, ECL, and CMOS, Interfacing of logic families.

**Semiconductor Memories & Programmable Logic**

Memory Organization, ROM, PROM, EPROM, EEPROM, RAM, Static RAM, Dynamic RAM cell, Memory Cell, Reading & Writing Operation in RAM, PLA, PAL & FPGA, SAP-1 Architecture.

**Recommended Books**

2. Digital System Principles & Applications by **R J Tocci** (PHI)
4. Integrated Electronics by **Millman & Halkias**, Tata McGraw - Hill Education

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**Paper Title:- Digital Electronics (Practical)**

**Paper Code:** EC364  
**Credit:** 1

**List of Experiments**

1. To Study the data sheets of TTL and ECL gates
2. Implementation of Adder and Subtractor using Logic Gates.
3. Implementation of Binary Adder/Subtractor.
5. Design & implementation of Combinational circuits using Multiplexers
6. Design and implement a Universal shift register having shift-right, shift-left, SISO, PIPO capabilities.
8. Implementations of Ripple counter.
10. Implementation of Synchronous counters with unused states and/or avoiding Lock Out condition.
11. To convert 8 bit Digital data to Analog value using DAC
12. To convert Analog value into 8 bit Digital data using ADC
13. To Perform Arithmetic & Logic operations on two 4-bit binary numbers using an ALU.
14. To Transfer the Data between Three Registers through Tristate Circuit
15. To Understand Decoder/Driver and their applications with display. To display a count from 00 to 99 with a delay of N seconds.

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**Paper Title: Engineering Mathematics – III**

**Paper Code:** AS301  
**Max. Marks/ Credit:** 50/4  
**Time:** 3 hours.

**Course duration:** 45 lectures of one hour duration each
Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A

Sequences and Series: (08)

Linear Algebra: (07)
Concept of linear independence and dependence, Rank of a matrix: Row – Echelon form, System of linear equations: Condition for consistency of system of linear equations, Solution by Gauss elimination method. Inverse of a matrix: Gauss – Jordan elimination method (Scope as in Chapter 6, Sections 6.3 – 6.5, 6.7 of Reference 1).

Eigen values, eigen vectors, Cayley – Hamilton theorem (statement only). Similarity of matrices, Basis of eigenvectors, diagonalization (Scope as in Chapter 7, Sections 7.1, 7.5 of Reference 1). (07)

PART - B

Complex Functions: (08)
Definition of a Complex Function, Concept of continuity and differentiability of a complex function, Cauchy – Riemann equations, necessary and sufficient conditions for differentiability (Statement only). Study of complex functions: Exponential function, Trigonometric functions, Hyperbolic functions, real and imaginary part of trigonometric and hyperbolic functions, Logarithmic functions of a complex variable, complex exponents (Scope as in Chapter 12, Sections 12.3 – 12.4, 12.6 – 12.8 of Reference 1).

Laurent Series of function of complex variable, Singularities and Zeros, Residues at simple poles and Residue at a pole of any order, Residue Theorem (Statement only) and its simple applications (Scope as in Chapter 15, Sections 15.1 – 15.3 of Reference 1). (07)
Conformal Mappings, Linear Fractional Transformations (Scope as in Chapter 12, Sections 12.5, 12.9 of Reference 1). (08)

References:
Vivek Sahai, Vikas Bist. Linear Algebra, Narosa Publishing House, New Delhi, 2002

Paper Title: Object Oriented Programming (Theory)
Course duration: 45 lectures of one hour duration each

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

**PART A**

Principles of Objected Oriented Programming [3]
Advantages of OOP, comparison of OOP with Procedural Paradigm

**C++ Constructs** [4]
Tokens, Expressions and control structures, various data types, and data structures, Variable declarations, Dynamic Initializations, Operators and Scope of Operators, Typecasting, Unformatted and formatted console I/O Operations

Functions [5]
Classes and Objects: Prototyping, Referencing the variables in functions, Inline, static and friend functions. Memory allocation for classes and objects, Arrays of objects, pointers to member functions.

Constructors and Destructors [5]
Characteristics and its various types, Dynamic Constructors, Applications, Order of Invocation, C++ garbage collection, dynamic memory allocation.

Polymorphism [5]
Using function and Operator overloading, overloading using friend Functions, type conversions from basic data types to user defined and vice versa.

**PART B**

Inheritance [5]
Derived classes, Types of Inheritance, Types of classes, Invocation of Constructors and Destructors in Inheritance, Aggregation, Composition, classification hierarchies, metaclass/abstract classes.

Pointers [5]
Constant pointers, Use of this Pointer, Pointer to derived and base classes, virtual functions, Bindings, Pure virtual Functions and polymorphism

I/O Operations and Files [4]
Classes for files, Operations on a file, file pointers

Generic Programming with Templates [6]
Definition of class template, Function Templates, Overloading Template Functions, Class templates and member functions templates with parameters, Standard C++ classes, persistent objects, streams and files, namespaces, exception handling, generic classes, standard template library: Library organization and containers, standard containers, algorithm and Function objects, iterators and allocators, strings, streams, manipulators, user defined manipulators and vectors

Introduction to Object Oriented System, Analysis and Design [3]

Recommended Books
1. Object Oriented Programming with C++ By Bala Guruswamy, TMH, Edition 3rd
2. C++ Primer Plus By Prata, Pearson Education, Edition 1\textsuperscript{st}
3. The C++ Programming Language By Bjarne Stroustrup, Edition 3\textsuperscript{rd}
4. Object Oriented Programming with Ansi and Turbo C++, Kamthane, Pearson Education, Edition 1\textsuperscript{st}
5. The Complete Reference to C++ By Schildt, TMH, Edition 4\textsuperscript{th}

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Paper Title: Object Oriented Programming (Practical)

Paper Code: EC 365 Credit: 1

List of Experiments
1. Implementation of Functions, Classes and Objects
2. Constructors and Destructors
3. Operator Overloading and Type Conversion
4. Inheritance and Virtual Functions
5. Files
6. Exception Handling and Generic Programming
FOURTH SEMESTER

Paper Title: Analog Electronic Circuits-2 (Theory)

Paper Code: EC 419       Max. Marks/ Credit: 50/4      Time: 3 hours

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A

Differential amplifiers: [7]

Operational Amplifier: [10]

PART B

Op-amp Applications: [8]
DC and AC amplifiers, Peaking amplifiers, Summing, Scaling and Averaging amplifiers, Differential amplifier, Instrumentation amplifiers, V to I and I to V converters, Differentiator and integrator, A to D and D to A converters, Log and antilog amplifiers, Sample and hold circuits.

Active Filter, Oscillators: [6]
Active filters, Essentials of Oscillator, Types of Oscillator, Sinusoidal Oscillator, Schmitt Trigger Circuits

Non-Linear Wave Shaping: [7]
Clipping circuits (diode & transistor), Diode comparators, Transistor differential comparator, Operational amplifier comparator, clamping circuits, Practical clamping circuit, clamping circuit.

Recommended Books:
1. Electronics Circuit Analysis and Design by Donald A. Neamen, Tata McGraw Hill
3. Integrated electronics by Millman & Halkias, TMH, Latest Edition

Paper Title: Analog Electronic Circuits-2 (Practical)
List of Experiments

1. To study the Pspice Simulation software
2. Design fabrication & testing of Differentiator Circuits using Op-Amp & simulate using P-spice
3. Design fabrication & testing of Integrator Circuits using Op-Amp & simulate using P-spice
4. Design fabrication & testing of adder/Subtractor Circuits using Op-Amp & simulate using P-spice
5. Design fabrication & testing of Clippers and Clampers Circuits using Op-Amp & simulate using P-spice
6. Design fabrication & testing of Universal Active filter & simulate using P-spice
7. To study the frequency response of OP-Amp & simulate using P-spice
8. To design Butter worth Low pass filter & simulate using P-spice
9. To design Butter worth High pass filter & simulate using P-spice
10. To design Butter worth Band pass filter & simulate using P-spice
12. RC Phase shift oscillator.

Paper Title: Communication Theory

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART-A

Introduction: The communication process, The layered approach, block diagram of a general communication system, A brief history of communications (3)

Representations of signals: Review of low pass and band pass filters, The communication channel as a filter, Low pass and band pass signals, Hilbert transform, Complex baseband representation of band pass signals, Band pass systems, phase and group delay, sources of information. (5)

Random variables and processes: Probability theory, classical and axiomatic definition of probability, Bayes theorem, conditional and joint probability, Random variables, PDF, CDF and their properties, conditional and joint PDFs for several random variables, Standard distributions (Binomial, Poisson, Uniform, Gaussian, Rayleigh), Derivation of the Poisson distribution, statistical averages, moments and characteristic functions, Random processes, Ergodicity and stationarity, mean, correlation and covariance functions, PSD of a random process and its properties, Transmission of a random process through an LTI system, Gaussian process, Central limit theorem. (15)

PART-B

Noise: Noise, classification and characterization of noise, Noise temperature, noise figure, narrowband noise and its representations, stochastic model of radio link channel, The requirement of a minimum working SNR, Link budgeting, FRIIS equation and system design for given SNR requirements. (9)
Elements of Information Theory: Information, Measure of Information, Entropy, source encoding theorems, fixed length and variable length codes, Coding efficiency, Huffman coding, lossless and lossy coding, Discrete memoryless channels, Mutual information and channel capacity, Channel coding theorem, Capacity of a Gaussian channel and Shannon’s channel capacity theorem.

Recommended Books

Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A
Microprocessor Architecture and Microcomputer Systems:
Microprocessor Architecture Memory, Input and Output Devices, The 8085 MPU, Example of an 8085-Based Microcomputer, Memory Interfacing

Interfacing I/O Devices:

Programming the 8085:
Introduction to 8085 Assembly Language Programming, 8085 Programming Model, Instruction Classification, Instruction Format, Data Transfer (Copy) Operations, Arithmetic Operations, Logic Operations, Branch Operations, Writing Assembly Language Programs.

Programmed Techniques with Additional Instructions:

PART B
Counters and Time Delays:
Counters and Time Delays, Hexadecimal Counter, Modulo Ten, Counter, Generating Pulse Waveforms.

Stack and Subroutines: Stack, Subroutine, Conditional Call and Return Instructions.
Interrupts: The 8085 Interrupt, 8085 Vectored interrupts, Multiple Interrupts, interrupts priority.

Interfacing Data Converters:

General –Purpose Programmable Peripheral Devices:
The 8255A Programmable Peripheral Interface, Illustration: Interfacing Keyboard and Seven-Segment Display, Illustration: Bi- directionnal Data Transfer between Two Microcomputers, Block Diagram and pin description of 8254 Programmable Interval Timer, 8259 Programmable Interrupt Controller, Direct Memory Access (DMA) and the 8257 DMA Controller, serial communication, Programmable communications interface 8251

Recommended Books
4. Douglas V. Hall, “Microprocessors and Interfacing programming and Hardware, Edition 2nd

Paper Title:- Microprocessors (Practical)

Paper Code: EC 465 Credit: 1

List of Experiments
1. Simple programs for sorting a list of numbers in ascending and descending order.
2. Sorting a list without destroying the original list.
3. Code conversion - Binary to Gray/Gray to Binary.
4. Program for addition of BCD numbers.
5. Program for multiplication of 8-bit numbers using Booth’s algorithm.
6. Interface an LED array and 7-segment display through 8255 and display a specified bit pattern/character sequence at an interval of 2 seconds.
7. Program for interfacing between two 8085 kits by using 8255.
8. Interface an ADC chip with microprocessor kit and verify its operation.
9. Interface an external 8253 to the microprocessor kit at the address given. Hence,
   (a). generate a pulse train of specified duty cycle at the given output line,
   (b). operate as a: N counter,
   (c). Count a train of pulses for a given duration.
10. Interface the given microprocessor kit to a personal computer through R.S-232C. The band rate is specified. Verify data transfer in both directions (P - PC and PC - P)

Paper Title:- Communication Engineering

Paper Code: EC 416 Max. Marks/Credit: 50/4 Time: 3 hours

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Note: The Semester question paper of a subject be of 50 Marks having 7 questions of equal marks. First question, covering the whole syllabus and having questions of conceptual nature, be compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART A

Amplitude modulation: (8)

Angle Modulation: (9)
Frequency and phase modulation, narrowband FM, frequency multiplication, Wideband FM, the spectra of FM signals, transmission bandwidth requirement for FM, generation of FM and PM signals, demodulation of FM and PM signals along-with mathematical analysis, The phase locked loop: linear and nonlinear models, The second order PLL, Nonlinear effects in FM systems.

Pulse Modulation: (5)
The need for sampling, the sampling process, Nyquist sampling theorem, Practical sampling, aperture effect and its analysis, band-pass sampling, PAM, PWM, PPM.

PART-B

Digital pulse modulation: (7)
Quantization Process, midrise and midtred quantizers, PCM, Noise in PCM, quantization noise, companding, A-law and µ-law companding, Delta modulation, analysis of noise specific to delta modulation, adaptive delta modulation, Linear prediction, DPCM.

Noise in communication systems: (7)
The receiver model and figure of merit of a communication receiver, Noise in AM receivers, threshold effect, Noise in FM systems, capture effect, FM threshold reduction, Pre emphasis and de emphasis, Noise in PCM.

Baseband pulse transmission: (9)
Line codes, Matched filter and its properties along-with mathematical analysis, the detection problem, probability of error due to AWGN, properties of the complimentary error function, Bandlimited nature of channels, Nyquist pulse shaping and ISI, raised cosine and duobinary pulse shaping, eye patterns, baseband M-ary transmission.

Recommended Books
Paper Title: Communication Engineering (Practical)

Paper Code: EC 466 Credit: 1

List of experiments
1. To measure the modulation index of AM signals using the trapezoidal method
2. To study DSB/SC AM signal and its demodulation using product Detector Circuit.
3. To study the voltages and waveforms of various stages of super-heterodyne receiver
4. To measure the sensitivity and selectivity of a super heterodyne radio receiver
5. To study the voltages and waveforms of various stages of FM Receiver
6. To study the pulse code modulation and de-modulation circuit
7. To study the Time division multiplexing and de-multiplexing circuits.
8. To study delta modulation and demodulation circuits.
9. To study sigma delta modulation and demodulation circuits.
11. Study of modulation techniques on MATLAB

Paper Title: Electromagnetic Theory (Theory)

Paper Code: EC 420 Max. Marks/ Credit: 50/4 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Maxwell’s equation: [5]
Maxwell’s equations in their integral and differential forms, Maxwell’s equations in free space and in harmonically varying fields, Physical Interpretation and Boundary Conditions.

Plane waves in Dielectric and Conducting Media: [15]
Uniform plane wave: properties, relation between E and H; Conductors and Dielectrics: Wave equations, wave propagation, Intrinsic impedance, skin effect, relaxation time, Poynting Theorem and Electromagnetic vector, application to energy radiation, Velocities of propagation: group velocity, phase velocity, Electromagnetic wave polarization.

PART B

Transmission lines: [8]
Basic principle, Equivalent circuit, Primary constants, Transmission line parameters, Transmission line equations, input impedance, relation between infinite and finite line, standing wave ratio and power.

Guided Waves: [7]
Wave Guides: [10]
Rectangular and Circular waveguides: T.M. & T.E. Modes, Wave impedance and characteristic impedances, Attenuation factor and Q of waveguides.

Recommended Books:
3. Antennas and Wave Propagation by G S N Raju, Pearson publications, Edition 1ST

IT FOR MANAGERS

Course : BE-MBA IV th Semester Max Marks/credit: 50/3

Paper – Compulsory

Paper Code: IBM- 401 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: To introduce the current concepts of IT and how it is influencing the working of organizations. Students are introduced to application of IT in Business field.

Internal Assessment: 50
External Assessment: 50

Part A
Information Technology (IT) : IT and society, IT infrastructure in India vis-à-vis developed nations (Telecommunication, Internet reach, PC, Broadband ,Mobile Phones ), IT applications in Healthcare & Education (8)

System Investigation & Analysis , Networking: System Analysis & Design , Symbols used in modeling a business process , modeling different business processes ,Networking concepts: Ethernet ,IP addressing, Functioning of Routers, Bridges, hubs and switches in a network, Telecommunication (GSM, CDMA , Wireless and other new technologies) (9)

Internet & Intranet : Functioning of Internet, Encryption & Digital signatures, Firewalls, Fraud on the Internet ,Virus , Hacking & Denial of Service attacks, Intellectual Property Protection on the Internet, Intranet & security (8)

Part B
E-Commerce & E-Governance: E-Commerce models , Intermediaries in E-Commerce, study of successful models like E-Choupal ,E-Payments (E-Cash, E-Wallets) and major players in the area, Online Shopping, Revenue models for Online Shopping Portals, Web Auctions : study of portals
like EBay, dealing with E-Waste, E-Governance in India, study of implementation of E-Governance in different states in India, scope for further improvement (10)

New Technologies shaping the IT field: Study of new technologies like RFID, WiMAX, Bluetooth, GPS, smart cards etc and their implementation case studies (4)

Online Banking: infrastructure and implementation of Online Banking in India, intermediaries in online banking (4)

Cloud Computing: The business model of cloud computing, advantages and drawbacks of adopting the cloud computing framework. (2)

References:
1. Business Data Communications & Networking, Jerry FitzGerald, Alan Dennis, John Wiley
2. Information Technology for Management: Improving Performance in the Digital Economy, Efraim Turban, Linda Volonino, John Wiley
FIFTH SEMESTER

MARKETING MANAGEMENT
Max Marks/credit: 50/3

Course : BE-MBA V th Semester

Paper – Compulsory

Paper Code: IBM- 501

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: This course introduces the students to marketing functional area and builds a foundation for further study. The core concepts of the subject are discussed.

Internal Assessment: 50
External Assessment: 50

Part A

Introduction to Marketing: Definition; Scope and Importance of Marketing; Key Customer Markets; Concepts/Philosophies of Marketing; Holistic Marketing Concept; Marketing Tasks; Marketing Mix

(4)

Marketing Environment: Marketing Environment; New Marketing Realities; New Consumer Capabilities; Demographic Environment; Social-Cultural Environment; Natural Environment; Technological Environment and Political-Legal Environment; SWOT analysis.

(8)

Analyzing Markets: Marketing Research Process; Sources of data collection; factors influencing consumer behavior; buying decision process; post-purchase behavior; Organizational Buying; Stages in the Buying Process.

(6)

Market Segmentation: Levels of market segmentation; segmenting consumer markets; Niche Marketing; segmenting business markets; Michael Porter’s five forces model; Analyzing competitors; strategies for market leaders; Targeting and Positioning.

(6)

Part B

Product Decisions: Product characteristics; classifications; differentiation; packaging and labeling; Product Life Cycle.

(4)

Pricing Strategies: Understanding Pricing; Setting the Price; Initiating and Responding to Price Changes; Reactions to Competitor’s Price Changes.

(5)
Marketing Channels: Marketing Channels; Role of Marketing Channels; Identifying Major Channel Alternatives; Types of Intermediaries; Channel-Management Decisions, Retailing, Wholesaling. (6)

Marketing Communication: The Role of Marketing Communications; Communications Mix-Advertising, Sales Promotion, Public Relations and Publicity, Events and Experiences, Direct and Interactive Marketing, Personal Selling. (6)

References:
1. Principles of Marketing, Philip Kotler, Pearson
2. Marketing Management, R. Saxena, TMH

HUMAN RESOURCE MANAGEMENT

Course: BE-MBA V th Semester 
Max Marks/credit: 50/3

Paper – Compulsory

Paper Code: IBM- 502
Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Human Resource Management (HRM), an important functional area in organizations is discussed and students are introduced to different aspects of HRM.

Internal Assessment: 50
External Assessment: 50

Part-A

Human Resource Philosophy — Changing environments of HRM — Using HRM to attain competitive advantage — Trends in HRM — Organization of HR departments — Line and staff functions — Role of HR Managers (4)

Job analysis: Methods - IT and computerized skill inventory - Writing job specification - HR and the responsive organization. (4)

Recruitment and selection process: Employment planning and forecasting — Building employee commitment: Promotion from within - Sources, Developing and Using application forms - IT and recruiting on the internet. (5)

Employee Testing & selection: Selection process, basic testing concepts, types of test, work samples & simulation, selection techniques, interview, common interviewing mistakes, Designing & conducting the effective interview, small business applications, computer aided interview. (8)

Part-B
Training & Development: Orientation & Training: Orienting the employees, the training process, need analysis, Training techniques, special purpose training, Training via the internet Performance appraisal: Methods - Problem and solutions - MBO approach - The appraisal interviews - Performance appraisal in practice. (7)

Managing careers: Career planning and development - Managing promotions and transfers. (3)


Industrial relation and collective bargaining: Trade unions - Collective bargaining - future of trade unionism. Discipline administration - grievances handling - managing dismissals and separation. (6)

References:

Paper Title: Microcontrollers and Interfacing (Theory)

Paper Code: EC 507
Max Marks/credit: 50/4
Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART -A

8051 Micro Controllers (04)
Architecture, Pin configuration, SFR’s, Memory, 8051 Addressing modes.

8051 Instructions (06)
Introduction to 8051 assembly language programming: JUMP, LOOP and CALL instructions, Arithmetic instructions: Unsigned addition and subtraction, unsigned multiplications and Division, signed number concepts and arithmetic operations, Logic And Compare instructions, I/O PORT

Input Output Programming (05)
Single bit instruction programming, Single bit operations with CY, Reading Input Pins Vs Port latch, Programming 8051 timers, counter programming.

8051 Serial Communication (02)
8051 connection to RS 232, 8051 serial communications Programming.
8051 Interrupts (04)
Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Interrupt Priority in the 8051,

Interfacing (03)
Interfacing LCD and keyboard interfacing

PART -B
PIC18F Family (03)
The Architecture of PIC family of devices, PIC18F instructions and assembly language.

Programming model (08)
PIC18F programming model, instruction set, instruction format. Data copy, arithmetic, branch, logical, bit manipulation and multiply-divide operations, Stacks, subroutines and macros, Role of Assembler.

Interrupts and Timers of PIC (05)
Concepts of Interrupts and Timers, Interrupts and their implementation in PIC18, The PIC18 timers, The CCP, Use of Interrupts in applications.

Serial I/O (03)
Concept of serial I/O, SPI protocol, RTC interfacing.

Interfacing (02)
Stepper motor, ADC and DAC interfacing using PIC 18.

Recommended Books:
2. The 8051 Microcontrollers by- Ayala, Penram Publications
3. PIC Microcontroller and Embedded Systems by Muhammad Ali Mazidi, Rolin D. McKinlay Danny Causey
5. The 8051 Microcontroller by Mackenzie,Pearson education

Paper Title: Microcontrollers and Interfacing (Practical)

Paper Code: EC 557 Credit: 1

Programming examples of 8051 and PIC. Interfacing using 8051 & PIC: Interfacing of LED, seven segment display, keypad, LCD etc. Microcontroller based project.

Paper Title:- VLSI Design (Theory)

Paper Code: EC 512 Max. Marks/Credit: 50/3 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.
PART A

Introduction to MOS Technology (7)

MOS Inverter Design (9)
nMOS inverter (Resistive Load, depletion and enhance type MOS load) and CMOS inverter: Basic Circuit Operation, static characteristics and switching characteristics, Noise Margins, Dynamic Power Dissipation – Switching Power Dissipation, Short Circuit Power Dissipation, Glitching Power Dissipation, Static Power Dissipation – Diode Leakage Current, Sub-threshold Leakage Current, Concept of BiCMOS inverter.

MOS circuit Design Processes (6)
MOS layers, Stick Diagrams, nMOS design style, CMOS design style, Design rules and layout, Lambda based design rules, contact cuts, Double Metal MOS process rules, CMOS lambda-based design rules.

PART B

Circuit Characterization (9)
Sheet Resistance estimation for MOS transistor and inverter, Capacitance Estimation, MOS Inverter Switching Characteristics – Delay time definition and calculation, Inverter design with delay time constraints rise time, fall time, Driving Large Capacitive Loads: cascaded inverter, super buffers, BiCMOS Driver.

CMOS Logic Design (9)
MOSFET Switch Logic, TG-based Switch Logic, Static CMOS Logic : CMOS NAND and NOR Gate, XOR, combinational circuit, Adder Circuits, Example of CMOS and Transmission gate D-type Latch design, BiCMOS logic circuits, Charge Sharing, Clock-CMOS, Pre-Charge/ Evaluate Logic, Domino Logic.

Design System Testing (5)
Designing for Testability, Scan Design Techniques, Signature analysis Technique and Boundary Scan Test.

Recommended Books
2. CMOS Digital Integrated Circuits- Sung- Mo (Steve) Kang and Yusuf Leblebici, Mc-graw Hill

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Paper Title: VLSI Design (Practical)

Paper code: EC 562 Credit: 1

List of Experiments (T-SPICE)
1. Introduction to Tanner tool.
3. Transient analysis of NOR, OR.
4. Transient analysis of NAND, AND.
5. DC and AC analysis of Inverter.
6. DC and AC analysis of Common source amplifier configuration.
7. DC and AC analysis of basic MOS based current mirror.

References:

Paper Title: Digital System Design (Theory)

Paper Code: EC 510  Max Marks/Credits: 50/4  Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Combinational Circuits: [20]

Error Correction and Detection: Error detection and correction techniques, Single error detection, Single error correction with double error

Fault detection and Location in combinational circuits: Different methods of detecting and locating Faults in combinational circuits.

PART B

Sequential Circuits [25]
Synchronous circuits: Concept of state diagram and state table, state assignment, Analysis and synthesis of sequential circuits, designs of Next state decoder and output decoder, state reduction, Machine minimization of completely and incompletely specified machines.


Fault detection and Location in sequential circuits.

Recommended Books
1. Switching and Finite Automata Theory by Kohavi, TMH.
2. Switching Theory & Logic Design by Rao, Pearson Ed.
3. Digital circuits and Logic Design By Lee, PHI.
5. Switching circuits for Engineers, Marcus, PHI
6. Introduction to Digital systems, James Palmier, David Perlman

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**Paper Title: Digital System Design (Practical)**
**Paper Code: EC 560 ** Credit: 1

**List of Experiments**
1. To Design and test the minimized circuit of Full Adder.
2. To Design and test the minimized circuit of BCD to Binary Converter
3. Implement decade counter using minimum number of gates
4. To test the minimized circuit of Decimal to BCD Encoder
5. Design and test hexadecimal to binary Encoder
6. Implement and test BCD to 7-Segment decoder
7. Design a sequence detector to detect a given sequence
8. Design and test twisted type ring counter
9. Implement the minimized circuit of Modulo-6 counter
10. To design, implement and test a 16:4 multiplexer using logic gates.
11. To design, implement and test a 4:16 demultiplexer using logic gates.
12. Design & test Johnson Counter.

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**Paper title: Computer Networks (Theory)**
**Paper Code: EC511 ** Max Marks/credit: 50/4 Time: 3 hours

**Course duration:** 45 lectures of one hour duration each

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking *four from Part A & four from Part B*. Candidates will be required to **attempt any five questions taking at least two from each Part.**

**PART A**

**Introduction:**

**Physical Layer:**
Data Communication concepts, Wired and Wireless transmission media, Transmission Impairments and Performance, Parallel and Serial Transmission, Switching, Circuit Switching, Packet Switching, and Virtual Circuit Switching.

**Data Link Layer**
Data link layer Design Issues, Framing, Error Detection and Correction, Flow Control, Sliding Window Protocols, HDLC, SLIP, and PPP.

**Medium Access Control Sublayer**

Channel Allocation, Description and Analysis of ALOHA, Slotted ALOHA, CSMA, CSMA/CD, IEEE LAN Standards: Ethernet (802.3), Gigabit Ethernet, Wireless LAN (802.11), Broadband Wireless (802.16), Bluetooth.

**PART B**

**Network Layer:**
Network layer Design Issues, IPv4 and IPv6 Structure and addresses, Routing algorithms– Shortest path, Flooding, Distance Vector Routing and Link State Routing; General principles of Congestion Control, Congestion Control in Datagram and Virtual Circuit Subnets, Brief idea of Quality of Service, Internetworking, IP protocol, IP addresses, Internet Control Protocols, Subnetting and Supernetting, ARP, NAT, DHCP.

**Transport Layer:**
The Transport Service, Elements of Transport Protocols, TCP & UDP Protocols

**Application Layer:**
Domain Name System, SMTP, FTP, HTTP, WWW, SNMP, Multimedia, and Cryptography.

**Recommended Books**
SIXTH SEMESTER

Paper title: Advanced Microprocessors (Theory)

Paper Code: EC 607 Max Marks/credit: 50/4 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

8086 Architecture: [4]
CPU Architecture, Internal operation, addressing modes, instructions formats, Instruction execution timing.

Assembly Language Programming: [7]
Assembler Instruction formats, Data Transfer, Arithmetic, Branch, loop, machine control, logical, Shift and rotate instructions, Directives and operators.

Modular Programming: [4]
Linking & relocation, stacks, procedures, Interrupt and routines.

Byte And String Manipulation: [4]
String instruction, prefix, text editor, number format conversion.

I/O Programming: [3]
Fundamental I/O consideration programmed I/O, Interrupt I/O, Block Transfer and DMA.

PART B

System Bus Structure: [5]
Minimum mode, Maximum mode system bus timing and bus standard.

Numeric Data Processor: [8]
8087, NOP data types, Processor architecture

Intel 386 And 486 Microprocessors: [10]
Intel 386 Microprocessor, Intel 486 Microprocessor, 486DX Architecture, Register Organisation of 486 Microprocessor, memory organization, Virtual Memory, Memory Management Unit(MMU), Interrupts and Exceptions, Addressing Modes of 80486.

Recommended Books
2. Intel’s Microcontroller Handbook

Paper Title: Advanced Microprocessors (Practical)

Paper Code: EC 657 Credit: 1

List of Experiments
1. Write a program to load register A, B, C and D with same constant (e.g., A1). Try to optimize your program in such a way that you use the smallest number of program bytes. Test your program in single step mode.

2. Assume that 4 bytes of data restored at consecutive locations of the data memory starting at location X. Write a program that loads register E with (X) i.e. With data contained at memory location X, D with (X+1), C with (X+2) and B with (X+3+0)
   (a) Use direct addressing mode (LDA)
   (b) Use register indirect addressing mode (M)
   Test your program in single step mode.

3. (a) Write a program which tests the zero condition of data byte specified at data memory location X. If it is zero, a 00 should be stored at location X+1, otherwise FF.
   (b) Write a program which tests the all-one-condition of data byte specified at date memory location X. If all the bytes are 1, store 01 at location X+1, otherwise 00.

4. Four bytes of data are specified at consecutive data memory locations starting X. Write a program which increments the value of 4 bytes by 1.

5. Two unsigned binary numbers are stored at consecutive data memory locations, X+1. Write a program for computing (X+1)-(X). The magnitude of the result should be stored at Y and the sign 00 if positive and 01 if negative at Y+1.

6. (a) A double precision number, i.e. a 16 bit unsigned number, is stored at X and X+1, with low order byte at X. Another double precision number is stored at Y and Y+1. Add the two numbers and store the result at W and W+1.
   (b) Same as (a). Subtract the two numbers and store the result at W and W+1.

7. A code word is stored at memory location X. Write a program for testing whether the code word belongs to 2/5 code, and set the location Y to FF if yes 00 if no. The code word is valid if three MSBs are zero and if the number if 1’s in the remaining 5 bits is 2 (2/5 Code).

8. A counter is defined as register (e.g. B) which gets decremented till zero. Define such a counter as subroutine. Write a program, which consist of two counters, You must implement the following steps
   1. Set initial value of counter to 1.
   2. Call counter subroutine.
   3. Set initial value of counter to 2.
   4. Call counter subroutine.
   5. Go back to step 1.

9. (a) N binary numbers are stored at consecutive data memory locations, starting at x, where N is defined at data member location “NUMBER”. Find the largest number and display it in the data field.
   (b) N binary numbers are started consecutive data member locations starting at X. Rearrange the numbers in ascending order.
10. A binary number is stored at data member locations X. Multiply the number by 10 and display the result in the address field (Hint: \( bx10 = bx2 + bx8 \), a multiplication by 2 corresponds to a shift left on a bit).

11. An 8 bit binary number is stored at data memory locations Y. Convert the decimal (BCD) and display the result in the address field.

12. Given 2 digit decimal number at data memory location X and X+1. Find the product using binary multiplications and display the result in address field.

13. Write a program for moving a data block starting address X to address Y. The addresses X, Y, as well as the block length are specified at some suitable data memory locations.

14. A two digit BCD number is stored at memory location X. Convert the number into binary and display the result in data field.

15. Divide a 16 bit number by a 8 bit number and display the result in data field.

16. Write a program for display of decimal umbers 00-99 in sequence with a delay of 15 seconds between any two consecutive numbers.

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**PART A**

**Waveguide Components:**

- Transitions, Discontinuities, Matched loads, Shorts, Flanges, Bends & Twists, Attenuator & phase shifters, Microwave Hybrid Circuits: Waveguide Tees, Magic (Hybrid) Tees, Scattering matrix of tees, Hybrid Rings (Rat-Race Circuits), Directional Couplers: Two Hole Directional Couplers, Scattering matrix of a directional coupler, Hybrid Couplers, Multi-hole couplers.
- Propagation in ferrites, Faraday rotation, Microwave Circulators: 3 port circulators and Isolators, YIG filter rectangular, Microwave cavities: Rectangular, Cylindrical Cavity Resonators, Q-factor of cavity resonator, aperture coupled cavity.

**Measurements:**

- Slotted waveguide, Swept Frequency Technique Detectors, Power & Impedance measurement.

**Solid State Sources – I:**

- Microwave BJTs, Heterojunction Bipolar Transistors (HBTs) and Tunnel Diodes, Metal-Semiconductor Field Effect Transistors (MESFET), High Electron Mobility Transistors (HEMT), Transferred Electron Devices (TEDs): GUNN Diode, LSA Diodes.
PART B

Solid State Sources – II: [4]

Microwave Tubes: [12]
Microwave Linear Beam Tubes: Klystron, Multicavity Klystron, Reflex Klystron, Helix Traveling-Wave Tubes (TWT), Coupled Cavity Travelling-Wave Tubes, Microwave Crossed-Field Tubes: Cylindrical Magnetron.

Microwave Transmission Lines: [5]
Strip Lines: Introduction, Microstrip Lines, Parallel Strip Lines, Coplanar Strip Lines and Shielded Strip Lines

Recommended Books
3. Microwave Engineering---Special topics---R. Chatterjee, East-West Press
5. Elements of Microwave Engineering---R. Chatterjee, East-West Press

Paper Title: Microwave Engineering (Practical)

Paper Code: EC 658 Credit: 1

List of Experiments
4. Measurement of SWR.
5. Reflex klystron mode curves.
6. Antenna radiation pattern.
7. Verification of Diode law.
8. Gunn Oscillator characteristics.
9. Directivity & Coupling of a directional coupler
10. To verify the waveguide law.

Paper title: Digital Communication (Theory)

Paper Code: EC 609 Max Marks/credit: 50/4 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A
Signal Space Analysis: [4]
Geometric Representation of Signals, Gram-Schmidt Orthogonalization Procedure.

Digital modulation techniques: [8]
PSK, FSK, MSK, QAM. Error calculations for PSK, FSK, MSK, QAM, Shannon’s limit, Signal to Noise Ratio Calculations in PCM and DM systems.

Information theory and coding: [10]
Entropy, Capacity of a Gaussian Channel. Block codes, Convolution coding and decoding, Soft and Hard decision decoding, State & Trellis diagrams, Viterbi Algorithm, Trellis decoded modulation.

PART B

Multiplexing and Multiple Access: [8]
Allocation of communication Resources, FDM/FDMA, TDM/TDMA, CDMA, SDMA, Multiple Access Communications and Architecture, Access Algorithms.

Spread Spectrum Techniques: [8]

Signal design for band-limited channels for No Inter Symbol Interference: [7]
Pulse shaping to Reduce ISI, types of error-performance degradation, demodulation/ detection of shaped pulses.

Recommended Books
1. Digital Communications by Bernard Sklar, PHI

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Paper title: Digital Communication (Practical)

Paper Code: EC 659 Credit: 1

List of Experiments
1. Design and practical implementation of ASK systems
2. Design and practical implementation of PSK systems
3. Design and practical implementation of QPSK systems
4. Design and practical implementation of FSK systems
5. To study the application of CDMA in voice communications
6. To practically compare the noise in PCM and DM systems
7. To practically study Frequency Division Multiplexing.
8. To practically study Time Division Multiplexing.
9. Implementation of Viterbi algorithm using C-language
MANAGERIAL ECONOMICS

Course: BE-MBA VI th Semester

Max Marks/credit: 50/3

Paper – Compulsory

Paper Code: IBM- 601

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: This course serves as an introductory course to Managerial Economics. Students are introduced to Microeconomics and Macroeconomics and its importance.

Internal Assessment: 50

External Assessment: 50

Part A

Introduction to Managerial Economics and Demand Concepts: Nature Scope and Importance of Managerial Economics, opportunity costs, incremental principle, time perspective, Equi marginal principles, Individual Demand, Market Demand, Kinds of Demand, Determinants of Demand, Demand Functions and Law of Demand, Income and Price elasticity of demand, substitution effect

(12)


(8)

Production Function: Concept and types, Returns to Factor and Returns to Scale, Law of Variable Proportions, law of diminishing marginal returns

(4)

Cost concepts and Analysis: Concept of Cost, Short run and Long-run Cost Curves, Relationships among various costs

(3)

Revenue Curves: Concept and Types.

(2)

Part B

Perfect Competition: Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run, Price Discrimination; Imperfect Competition, Monopolistic Competition, Oligopoly and Barriers to Entry.

(8)

Economic Environment of Business- Meaning of GDP, Monetary and Fiscal Policy, Deficit Financing, Inflation, Subsidies, Devaluation of Rupee, Liberalization, Privatization and Disinvestment

(8)

References:

1. Managerial Economics, Mote, Paul Gupta, Vikas Publisher, New Delhi
Corporate Legal Environment

Course: BE-MBA VI th Semester

Max Marks/credit: 50/3

Paper – Compulsory

Paper Code: IBM- 602

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: The Corporate Legal environment has a profound impact on the working of organizations. This course introduces the students to various laws related to business.

Internal Assessment: 50

External Assessment: 50

Part A

The Contract Act 1872: Introduction: Meaning of contract; Types of contract; Essential elements of a valid contract. Offer: Meaning and Definition of offer; Types; Rules regarding offer; Revocation of offer; Lapse of offer.

Acceptance: Meaning and Definition of acceptance; Rules regarding acceptance; Revocation of acceptance.

Consideration: Definition; Types; Rules; Exceptions

Capacity of Parties: Position of Minor, Person of unsound mind, Persons disqualified by law.

Free consent; Discharge of contract, Remedies for Breach of contract, Contract of Indemnity, Contract of Guarantee

(10)

Sales of Goods Act 1930: Meaning; Difference between Sale of Goods and Agreement to Sale, Essentials of Contract of Sale; Difference between Contract of Sale and Hire-Purchase Agreements; Conditions and Warranties; Transfer of property or ownership; Performance of Contract of Sale; Rights of Unpaid Seller; Auction Sale.

(8)

The Companies Act, 1956: Definition; Meaning; Features; Types of companies; Incorporation of a company; Memorandum of Association; Articles of Association and Prospectus; Doctrine of Indoor Management; Lifting of Corporate Veil; Registration and Incorporation of a company; Doctrine of Ultravires Transactions; Winding up of company.

(10)

Part B


(10)

Information Technology Act-2000: Objective of the act, documents excluded from the scope of the act, digital signatures, types of digital signatures in India, certifying authorities in India, regulation of certifying authorities, duties of subscribers, offences, appellate tribunal, penalties and adjudication

(7)
References:
2. An Introduction to Mercantile Laws- N.D. Kapoor, Sultan Chand & Sons

Paper Title: Electronic Measurements and Instrumentation
Paper Code: EC612  Max Marks/credit: 50/4  Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART-A

Measurement Systems and Characteristics Of Instruments: [8]
Introduction- Measurements, Significance of measurements, Methods of measurements, Instruments and measurement system, Electronic instruments, Classification of instruments, Deflection and Null type instruments, Comparison Analog and Digital Modes of operation, Application of measurement system, Errors in measurements, Types of errors, Accuracy and Precision, Noise, Resolution or discrimination, loading effects, Units, Absolute units, Fundamental and Derived units.

Electromechanical Indicating Instruments: [8]

Electronic Instruments: [6]

PART-B

Transducers: [8]
Principles of operation, Classification of transducers based upon principle of transduction, Summary of factors influencing the choice of transducer, Qualitative treatment of Strain Gauge, LVDT, Thermocouple, Piezo-electric crystal and Photoelectric transducers.

Signal Conditioning: [8]
Data Display and Recording Devices: Principle, Operation and Use of -LEDs, LCDs, Recorders-Paper Chart, Magnetic Tape, Semi-Conductor;

**Virtual Instrumentation**

[7]
Introduction to lab VIEW Front Panel, Block Diagram, Tools And Palettes, Menus, Code Debugging, Creating Sub-Vis, For Loop, While Loop, Structures, Arrays And Clusters, Graphs And Charts, File Input And Output , Data acquisition and applications.

**Books Recommended**

1. W.D. Cooper and A.D. Hilfrick: Electronic Instrumentation & Measurement Techniques, PHI.
2. R.H.Bishop, Learning with LabVIEW 7 Express, Pearson Education, Delhi.
4. Kalsi H S “Electronic Instrumentation” TMH.


**Paper title: Electronic Measurements and Instrumentation (Practical)**

**Paper Code: EC 662 Credit: 1**

Experiments based on Theory on Hardware and Software (LabVIEW).
SEVENTH SEMESTER

Paper Title:- Fiber-optic Communication Systems (Theory)

Paper code: EC 708  Max Marks/credit: 50/3  Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Overview of Optical Fiber Communication: [03]
Elements of basic communication system, communication system architecture, advantages of optical communication, Definition of dB and dBm.

Optical Fiber Wave Guides: [09]
Ray Theory of Transmission: Total Internal reflection, Acceptance Angle, Numerical Aperture, Electromagnetic mode theory for optical communication of both types of fibers viz step index fiber and graded index fibers, Fiber materials, fiber fabrication, fiber to fiber joints, fiber splicing, optical fiber connectors.

Signal Degradation in Optical Fibers: [07]
Attenuation, Material absorption losses, linear and non linear scattering losses, fiber bend loss, dispersion viz intermodal dispersion and intramodal dispersion, overall fiber dispersion and polarization mode dispersion, Introduction to nonlinear effects: Self phase modulation, cross phase modulation, Stimulated Brillion and Raman scattering, Four Wave Mixing.

PART B

Optical Sources and Detectors: [08]
Sources: Basic Concepts: emission & absorption, p-n junctions, non-radiative recombination, semiconductor materials. LED: power-current characteristics, internal quantum efficiency, LED spectrum, modulation Response, LED structures. LASER Diode: optical gain, feedback and Laser threshold, internal quantum efficiency and Laser characteristics.
Detectors: Basic Concepts: Detector responsivity, rise time bandwidth. common photodetectors: p-n photodiodes, p-i-n photodiodes, avalanche photodiode, MSM photodetector.

Lightwave systems [07]
System architectures: point to point links, Distribution networks, local area networks. Design guidelines: loss-limited lightwave systems, dispersion-limited lightwave systems, power budget, rise time budget. Multichannel systems: WDM lightwave systems; system performance parameters: Bit Error Rate (BER), Eye Diagrams, optical signal to noise ratio.

Optical components and sensors: [08]
Coupler/splitter, optical switches, optical add/drop multiplexers, fiber grating, Basic applications & types of optical amplifiers. Introduction to fiber-optic sensors, Intensity modulated sensors.

Advances in Optical Communication: [3]
Introduction to Free Space Optics, Photonics Microwave, DWDM

Recommended Books
5. Vivekanand Mishra, Sunita P. Ugale, "Fiber-Optic Communication", Wiley India.

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Paper Title:- Optical Communication (Practical)

Paper code: EC 758  credit 1  Max. Marks: 50

List of Experiments

1. To study the propagation loss and bending loss in optical fiber.
2. To set up a fiber optic analog link.
3. To set up a digital fiber optic link.
4. Study of intensity modulation technique using analog and digital input signal.
5. To study the frequency modulation and demonstrate voice transmission through optic fiber using FM.
6. Measurement of optical power and propagation loss using optical power meter.
7. To determine the bit rate supported by the fiber optic link.
8. To study the characteristics of PIN diode.
9. To demonstrate the concept of WDM system.

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Paper Title:-Digital Signal Processing (Theory)

Paper code: EC 709  Max Marks/credit: 50/4  Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Introduction:  (7)

Frequency Domain Representation of Signals & Systems:  (15)
Review of DTFT, Discrete Fourier Transform and its properties, Filtering of long data sequences, Goertzel Algorithm, Divide and Conquer approach to computation of DFT, Fast Fourier Transform, Decimation in time and Decimation in frequency algorithms, Computations Complexity
Calculations, Discrete Cosine Transform, Audio & Video Coding, JPEG coding, Time-Frequency Analysis, Wavelet Transform.

**PART B**

**Digital Filters:** (9)
Ideal Filter vs Practical Filters, General Specifications and Design Steps, Comparison of FIR & IIR Filters, Design of FIR Filters using Window technique, Frequency sampling technique, Design of IIR Filters using Impulse Invariance technique, Bilinear Transformation, Design of IIR Filters using Butterworth, Chebyshev and Elliptic filter, Digital frequency transformation.

**Implementation of Discrete Time Systems:** (5)
Block diagrams and signal flow graphs for FIR and IIR systems, Direct form, Cascade form, Frequency Sampling Structures, and Lattice structures for FIR systems, Direct form, Cascade form, Parallel form, and Lattice and Lattice-Ladder Structures for IIR systems, Representation of fixed point and floating point numbers, Finite word length effects, Arithmetic operations.

**Multirate Signal Processing:** (7)
Basic Sampling rate alteration devices, Time domain and frequency domain representation, Multirate structures, Multistage design, Polyphase decomposition, Introduction to digital filter banks.

**Processors:** (2)
Architecture of TMS320CXX series, Addressing modes, Memory management

**Recommended Books**

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**Paper Title:** Digital Signal Processing (Practical)

**Paper code:** EC 759 credit 1 Max. Marks: 50

**List of Experiments:**
1. Introduction to MATLAB.
2. Effect of noise on signals in MATLAB.
4. Convolution of sequences in MATLAB.
5. Correlation of sequences in MATLAB.
7. System Response to Arbitrary Inputs.
8. DFT & IDFT of two sequences.
9. FFT of two Sequences.
10. Circular Convolution.
11. overlheat-add method and overlap-save methods.
12. FIR Filter Design in MATLAB.
13. IIR Filter Design in MATLAB.
15. Implementation of digital filter banks.

Paper Title: Wireless Communication (Theory)

Paper code: EC 710                  Max Marks/credit: 50/4

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Introduction [12]
Evolution of Mobile Communication Systems, Paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems, 2G cellular networks, 2.5 G wireless network, HSCSD, GPRS, EDGE technology, 3G wireless network, UMTS, 3G CDMA2000, 3G TD-SCDMA, Wireless Local Loop, Blue tooth and Personal Area Networks.

System Design Fundamentals [9]
Frequency reuse, Channel alignment strategies, handoff strategies, interference and system capacity, improving coverage and capacity in cellular systems, parameters for mobile multipath channel, Small scale fading.

PART B

Modulation Techniques [10]
Amplitude modulation, Angle Modulation, Digital Modulation, Linear modulation techniques, Constant envelope modulation, spread spectrum modulation techniques, Equalization, Equalizers in communication receiver, Diversity techniques, RAKE receiver, Fundamentals of channel coding

Multiple Access Techniques [3]
FDMA, TDMA, CDMA, SDMA

Wireless Networking [4]
Difference between wireless and fixed telephone networks, development of wireless networks, ISDN

Wireless Systems [7]
GSM, GSM Architecture, CDMA digital cellular standard, IS-95 system.

Recommended Books
1. Wireless Communications Principles and practice by Theodore S. Rappaport, Prentice Hall India
2. Modern Wireless Communications by Simon Haykin, Michael Moher, PHI
3. Wireless Communication and Networking By Jon W Mark, PHI
Paper Title: Wireless Communication (Practical) credit 1

Paper code: EC 760

Max. Marks: 50

Note: Students are required to perform experiments from any six blocks by selecting at least two from each sub-block.

List of Practicals

1. Equipment orientation
   a. Familiarisation with spectrum analyser, simulation softwares, various kits to be used in the laboratory.
   b. Review of working of function generator, CRO, multimeter & other instruments.

2. Simulation and implementation of baseband digital signals
   a. Types of baseband signals: unipolar, polar, bipolar, RZ, NRZ, etc.
   b. Distortion and noise. Eye diagram.

3. Simulation and implementation of modulated digital signals
   a. PSK, ASK and FSK modulations.
   b. Demodulation with envelope detection and synchronous.
   c. PSK differential modulation.
   d. Quadrature modulations (QASK and QPSK).
   e. QAM modulation.

4. Global System for Mobiles (GSM)
   c. AT Commands
   d. Working of GSM mobile station.

5. Multiple Access
   a. Time division multiple Access
   b. Frequency division multiple access

6. Spread Spectrum communication systems
   a. Pseudo-noise coders
   b. Direct sequence spread spectrum communication systems
   c. Frequency hopped spread spectrum communication systems
   d. CDMA wireless computer communication systems

7. Channel Characteristics
   a. Multipath channel propagation characteristics
      a. Bit-error rate measurement

8. Wireless Networks
   a. Bluetooth wireless network.
   b. Wi-Fi
   c. Wi-Max
Paper title: Operating Systems

Paper Code: EC711 Max Marks/credit: 50/3 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Introduction: [5]
What is an O.S., O.S. Functions; Different types of O.S.: batch, multi-programmed, time sharing, real time, distributed, parallel; General structure of operating system, O/S services, system calls.

Process Management: [10]
Introduction to processes - Concept of processes, process scheduling, operations on processes; Inter Process Communication, Critical Sections, Mutual Exclusion with Busy Waiting, Sleep and Wakeup, Semaphores, Message passing; CPU scheduling- scheduling criteria, pre-emptive & non-pre-emptive scheduling, Scheduling Algorithms: FCFS, SJF, RR and priority, Circuit Switching & Packet Switching.

Memory Management: [6]
background, logical vs. physical address space, memory management without swapping; swapping; contiguous memory allocation, paging, segmentation, segmentation with paging; Virtual Memory, demand paging, performance, page replacement, page replacement algorithms (FIFO, Optimal ,LRU); Thrashing.

PART B

File Systems: [6]
Files - file concept, file structure, file types, access methods, File attributes, file operations; directory structure, allocation methods (contiguous, linked, indexed), free-space management (bit vector, linked list, grouping), Protection mechanisms.

Secondary Storage: [6]
Disk Structure, Disk Scheduling (FCFS, SSTF, SCAN, C-SCAN, LOOK), Disk Management (Disk Formatting, Boot Blocks, Bad Blocks), Swap Space Management (Swap Space use, Swap Space Location, Swap Space Management)

Deadlocks: [6]
Introduction to deadlocks, Conditions for deadlock, Resource allocation graphs, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention

Introduction of Android, IOS, Windows Operating system in Mobile phone

Recommended Books:
Paper Title: RADAR ENGINEERING (Theory)

Paper code: EC 712  Max Marks/credit: 50/3  Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Radar Fundamentals  [7]

Radar Signal Processing: Moving Target Indicators & Doppler Processing  [7]
Doppler & Moving Target Indicator(MTI) Fundamentals, MTI Principles & Methods, Blind Doppler Shifts & PRF Stagger, CW, High PRF, & Medium PRF Doppler Processing.

The Radar Equation  [10]

PART B

Targets & Interfering Signals  [7]
Radar cross-section (RCS), Definition & Fundamentals, RCS Fluctuations, Target Fluctuation Models.

Target Echo Information Extraction  [7]
Ranging, Target Velocity (Doppler Shift), Range & Velocity with CW & Pulse Doppler Waveforms, Radar height-finding.

Radar Antennas  [7]

Recommended Books
1. Radar: Principles, Technology, Applications by Byron Edde (Pearson Education)
2. Introduction to Radar Systems by Skolnik (Mc Graw Hill)
3. Microwave and Radar Engg by M. Kulkarni, Umesh Publications

Paper Title: Web Technologies (Theory)

Paper Code: EC 713  Max Marks/credit: 50/3  Time: 3 hours
Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART A**

**Internet and World Wide Web:** [6]
Introduction, Internet Addressing, ISP, types of Internet Connections, Introduction to WWW, WEB Browsers, WEB Servers, URLs, http, WEB applications, Tools for website creation.

**HTML:** [5]
Introduction to HTML, Lists, adding graphics to HTML page, creating tables, linking documents, frames, HTML and Style sheets

**Java Script:** [11]
Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, JavaScript DOM, creating forms, introduction to Cookies.

**PART B**

**Java:** [16]
Introduction to java objects and classes, control statements, arrays, inheritance, polymorphism, Exception handling, Multithreading, Building the Java Applets, Boxes, Radio Button, Managing Multiple controls, Scrollbars, Choice controls, Scrolling lists, Windows, Menu and Dialog Boxes, Pop up Windows, Graphics in Java, Mouse events, Drawing Objects, Fonts, Canvases, Images, Image maps, Graphics, Animation.

**XML:** [7]
Why XML, XML syntax rules, XML elements, XML attributes, XML DTD displaying XML with CSS.

**Recommended Books:**
3. Web Enabled Commercial Application Development, by Ivan Bayross, BPB.

**Paper Title:** Cyber Laws & IPR

**Paper Code:** AS 701  
Max Marks/credit: 50/3  
Time : 3Hrs

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART A**

**Basics of Computer & Internet Technology** [8]
Internet, ISP & domain name; Network Security; Encryption Techniques and Algorithms; Digital Signatures

**Introduction to Cyber World** [3]
Introduction to Cyberspace and Cyber Law; Different Components of cyber Laws; Cyber Law and Netizens

**E-Commerce** [8]
Introduction to E-Commerce; Different E-Commerce Models; E-Commerce Trends and Prospects; E-Commerce and Taxation; Legal Aspects of E-Commerce.

**PART B**

**Intellectual Property Rights**

IPR, Copyright and Patents, International Treaties and Conventions, Business Software Patents, Domain Name Disputes and Resolution.

**IT Act, 2000**

Reasons, Aims, Objectives and Applications, Regulators under IT Act, Role of Certifying Authority, Digital Signature Certificates, Duties of the Subscribers, Cyber Crimes-Offences and Contraventions, Grey Areas of IT Act.

**Project Work**

Candidates will be required to work on a project. At the end of the course, students will make a presentation and submit the project report.

**Recommended Books**


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**ACCOUNTING FOR MANAGERS**

Course: BE-MBA VIIth Semester

Max Marks/credit: 50/3

**Paper – Compulsory**

*Paper Code: IBM- 701*  
*Time: 3 Hours*

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** This course introduces the students to basics of Accounting functional area and builds the foundation for Financial Management.

Internal Assessment: 50  
External Assessment: 100

**Part-A**

Accounting and its functions; Basic Accounting Concepts and Accounting Conventions; Accounting Principles; Generally Accepted Accounting Policies (GAAP); Accounting Standards;
Branches of Accounting: Financial Accounting; Cost Accounting; Management Accounting; Accounting Equation; Accounting Structure; Types of Accounts. (4)

Rules regarding Journal Entries; Recording of Journal Entries; Ledger Posting; Trial Balance; Preparation of Final Accounts; Trading Account; Profit & Loss Account; Balance Sheet; Treatment of Adjustments into trial balance. (7)

Meaning of Management Accounting; Nature; Scope; Objectives; Functions of Management Accounting; Relationship between Financial and Management Accounting; Tools and Techniques of Management Accounting; Limitations; Meaning of Financial Statement; Importance and Limitations of Financial Statement; Meaning and Objectives of Financial Statement Analysis; Limitation of Financial Analysis. (10)

Ratio Analysis: Meaning of Ratio; Interpretation of Ratios; Significance of Ratio Analysis; Limitations of Ratio Analysis; Classification of Ratio; Analysis of Short-term financial position; Analysis of Long term financial position; Analysis of profitability. (7)

**Part-B**

Fund Flow Analysis: Meaning and Concept of Funds; Meaning of Fund Flow; Meaning of Fund Flow Statement; Significance; Limitations; Procedure of Preparing Fund Flow Statement; Schedule Showing Change in working capital; Adjusted Profit & Loss Account; Statement of Sources and Applications of Funds. Treatment of Adjustment; (9)

Cash Flow Analysis: Meaning; Classification of Cash Flow; Comparison between Fund Flow Statement and Cash Flow Statement; Difference between Cash Flow Statement and Cash Budget Limitations; Preparation of Cash Flow Statement (as per AS-3); Treatment of Adjustments. (8)

References:
1. Managerial Accounting, Hilton, Ramesh, Jaidev, TMH

**STATISTICS & RESEARCH METHODOLOGY**

Course : BE-MBA VII th Semester  
Max Marks/credit: 50/3

**Paper – Compulsory**

*Paper Code: IBM- 702*  
*Time: 3 Hours*

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** The course introduces the students to statistical techniques and methods of research

Internal Assessment: 50  
External Assessment: 100

**Part A**

Introduction to Descriptive Statistics: Types of Data, Measures of Central Tendency; Measures of Dispersion- Range, Quartile Deviation, Mean Deviation, and Standard Deviation, Skewness & Kurtosis. (4)
Probability: Basic probability concepts, Joint probability, Conditional probability, Bayes Theorem, Random Variables and Discrete Probability distributions: Poisson, Binomial and Normal, Normally distributed variables, areas under the standard normal curve (10)

Research Design: Meaning, Characteristics and various concepts relating to research design and classification of research design, Importance. (4)

Measurement and Scaling: Data Types Nominal, Ordinal and Ratio scale; scaling techniques. (3)

**Part B**

Formulation of Hypothesis: Confidence Intervals, Meaning, Characteristics and concepts relating to testing of Hypothesis (Parameter and statistic, Standard error, Level of significance, type-I and Type-II errors, Critical region, one tail and two tail tests); Procedure of testing Hypothesis. Numerical problems based on chi-square test, Hypothesis tests for one population mean: Z test, t-test, Wilcoxon Signed-Rank test, Inferences for two population means, Mann-Whitney Test, F-test (15)

Data Analysis & Interpretation: Introduction to Multivariate analysis- Multiple and partial correlation, Analysis of Variance (ANOVA)-One way and Two way ANOVA. Introduction to discriminant analysis and Factor Analysis (9)

**References:**
1. Business Research Methods, William G. Zikmund, Cengage Learning India
2. Business Research Methods, Cooper, D.R. & Schindler, TataMcGraw-Hill
PART A
Introduction

Image Perception
Structure of the human eye, light, luminance, brightness, contrast, image model, sampling and quantization-uniform and non uniform, basic relationships between pixels, Imaging geometry, Camera model, Perspective Transformation, stereo imaging.

Image Enhancement
Spatial domain methods, Enhancement by point processing, histogram processing, image subtraction, image averaging, spatial filtering, smoothing filters, sharpening filters, Enhancement in the frequency domain, Color image processing.

PART B
Image Transforms

Image Compression

Recommended Books
1. Digital Image processing by R.C. Gonzalez and R.F.Woods (Pearson Education)
4. Digital Image Processing and Analysis, by B. Chandra and D. Dutta Majumder
5. Algorithms for image Processing and Computer Vision by James R.Parker
7. Digital Image Processing using MATLAB by Woods & Gonzalez (Pearson Education)
Paper Title: Digital Image Processing (Practical)

Paper code: EC 858 Max. Marks: 50

List of Experiments (Based on MATLAB)

1. Intensity transformation
2. Histogram Processing.
3. Spatial Filtering.
5. Image Restoration.
6. Image Denoising
7. Color Image Processing
8. Wavelet Transform
9. Image Compression

Paper Title: Advanced Digital Communication (Theory)

Paper code: EC 809 Max Marks/credit: 50/3 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A

Elements of a Digital communication system: [5]

Communication channels and their characteristics, mathematical models for communication channels, recent trends in digital communication, Deterministic and Random Signal Analysis, Band pass and Low pass Signal Representation, Signal space representation of waveforms.

Digital modulation Schemes: [9]

Representations of digitally modulated signals, memory less modulation methods, PAM, PM, QAM, multidimensional signaling, Signaling schemes with memory, CPFSK, CPM, Power spectrum of Digitally modulated signals, PSD of a digitally modulated signal with memory, PSD of linearly modulated signals.

Optimum Receivers for Additive White Gaussian Noise Channels: [9]

Waveforms and vector channel models, waveforms and Vector AWGN channels, Optimum detection for the Vector AWGN channel, Implementation of the optimal receiver for AWGN channels, the correlation receiver, matched filter receiver, frequency domain interpretation of the matched filter, Performance analysis of wire line and radio communication systems.

PART B

Characterization of band-limited channels, Signal Design for band-limited channels, The nyquist criterion, Controlled ISI, Optimum receiver for channels with ISI and AWGN, Optimum MLR, MLSE for Discrete time white noise filter model, Linear equalization, Decision feedback equalization.

**Multichannel and Multicarrier System:**
Multichannel Digital Communication in AWGN channels, binary signals, M-ary orthogonal signals, Multicarrier communication, single-carrier versus multicarrier modulation, Capacity of a Non-ideal linear filter channel, orthogonal frequency division multiplexing (OFDM), modulation and demodulation in an OFDM system, Spectral characteristics of multicarrier signals, Bit and Power allocation in multicarrier modulation.

**Recommended Books**

**Paper Title: Advanced Digital Communication (Practical)**
**Paper code:** EC 859
**List of Experiments: based on Theory**

**Paper Title: Neural Networks and Fuzzy Logic (Theory)**
**Paper code:** EC 810  
**Max Marks/credit:** 50/3  
**Time:** 3 hours

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART A**

**Fundamentals of Neural Networks**

**Supervised Learning**
Learning and memory, Representation of perceptron, Linear separability, Perceptron Learning, Training of single layer and multi-layer, back propagation training algorithm, Applications of back propagation, Universal function approximation.

**Attractors Neural Networks**
Introduction, Associative memory, Hopfield networks, Content addressable memory, Bidirectional associative memories.
ART Networks [7]
Vector quantization & simplified ART architecture, Architectures & algorithms of ART1 & ART2 networks, Applications.

Self-organizing Feature Map [6]
Introduction, Competitive learning, Mexican Hat networks, SOFM algorithm, Applications.

Fuzzy Logic [7]
Basic concepts of Fuzzy Logic, Fuzzy vs Crisp set, Fuzzy uncertainty & Linguistic variables, membership functions, operations on fuzzy sets, fuzzy rules for approximate reasoning, variable inference techniques, defuzzification techniques, Applications of fuzzy logic, Fuzzy system design.

Recommended Books
1. Neural Networks – A Classroom Approach by Satish Kumar, TMH.
2. Neural Networks, fuzzy Logic, and Genetic Algorithms by Rajasekaran & Vijayalakshmi Pai, PHI.
5. Fuzzy Logic with engineering applications by Ross, Mc-Graw Hill

Paper Title: Neural Networks and Fuzzy Logic (Practical)
Paper code: EC 860
List of Experiments: based on Theory

Paper title: Embedded System Design (Theory)

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART -A

Embedded system concepts: [5]
Introduction to embedded systems, Difference between embedded and general purpose computing, Embedded system architecture, Embedded system model, RISC, CISC, VLIW, superscalar architecture.

The ARM Architecture [5]
The ARM Family History, The Acorn RISC’ Machine, Architectural inheritance, The ARM programmer’s model, ARM development tools

ARM Assembly Language Programming [6]
Data processing instructions, Data transfer instructions, Control flow instructions, Writing simple assembly language programs

The ARM Instruction Set [8]
Introduction, Exceptions, Conditional execution, Branch and Branch with Link (B, BL) Branch, Branch with Link and exchange (BX, BLX), Software Interrupt (SWI), Data processing instructions, Multiply instructions, Count leading zeros (CLZ - architecture v5T only), Single word and unsigned byte data transfer instructions, Half-word and signed byte data transfer instructions, Multiple register transfer instructions, Swap memory and register instructions (SWP), Status register to general register transfer instructions, General register to status register transfer instructions

**PART - B**

**ARM Organization and Implementation**

3-stage pipeline ARM organization, 5-stage pipeline ARM organization, ARM instruction execution, ARM implementation, interfacing with various external hardware devices like LED, 7 segment, LCD, Keypad.

**The Thumb Instruction Set**

The Thumb bit in the CPSR, The Thumb programmer’s model, Thumb branch instructions, Thumb software interrupt instruction, Thumb data processing instructions, thumb single register data transfer instructions, Thumb multiple register data transfer instructions, Thumb implementation, Thumb applications

**Architectural Support for System Development**

The ARM memory interface, The Advanced Microcontroller Bus Architecture (AMBA)

**ARM Processor Cores**

ARM7TDMI, ARM8, introduction to ARM 9 architecture, Difference between ARM7 & ARM9 architecture, Introduction to RTOS

**Books:**

1. ARM System-on-Chip Architecture (2nd Edition) by Steve Furber
3. ARM Assembly Language Programming & Architecture (Mazidi & Naimi ARM Books)

**Reference books:**

1. ARM System Developer's Guide: Designing and Optimizing System Software by The Morgan Kaufmann
2. ARM Reference manual from www.arm.com
3. An Embedded Software Primer by David E. Simon

**Paper Title: Embedded System Design (Practical)**

**Paper code:** EC 861

**List of Experiments:** Programming examples of ARM Processor, Interfacing using ARM: Interfacing of LED, Seven segment display, keypad, LCD etc.

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**Title: Analog and Mixed Signal Design (Theory)**

**Paper code:** EC 813 **Max Marks/credit:** 50/3 **Time:** 3 hours

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.
PART- A

PART- B

Reference Books:

Paper Title: Analog and Mixed Signal Design (Practical)
Paper code: EC 863
List of Experiments: based on Theory

Title: MEMS & Microsystems
Paper code: EC 814 Max Marks/credit: 50/3 Time: 3 hours

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART-A
Overview of MEMS and Microsystems

Working Principles of Microsystems

**Scaling Laws in miniaturization** [6]
Introduction to scaling, Scaling in Geometry, scaling in rigid body dynamics, scaling in electrostatic forces, scaling in electromagnetic forces, scaling in electricity.

**Materials for MEMS & Microsystems** [5]
Substrate & wafer, active substrate material, silicon as substrate, gallium arsenide, quartz, piezoelectric materials, polymers, packaging material.

**PART B**

**Microsystems Fabrication Processes** [7]
Photolithography, Ion implantation, Diffusion, Oxidation, Chemical Vapor Deposition, Physical vapor deposition, epitaxy, etching.

**Overview of Micromachining** [8]
Bulk micromachining, surface micromachining, LGA process.

**Microsystems Design** [7]

**Reference Books:**
1. MEMS & Microsystems: Design and Manufacture. Tai-Ran Hsu. Mc graw Hill.
2. MEMS, N Mahalik. Mc graw Hill.
3. MEMS and MOEMS Technology and Applications, P.Rai Choudhury. PHI.
4. Microsensors MEMS & Smart Devices, Gardner, CBS Publishers

**Paper Title: Artificial Intelligence (Theory)**

**Paper code:** EC 815  |  **Max Marks/credit:** 50/3  |  **Time:** 3 hours

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART A**

**Introduction:** [6]

**Problem solving techniques:** [9]
State space search, control strategies, heuristic search, problem characteristics, production system characteristics, Generate and test, Hill climbing, best first search, A* search, Constraint satisfaction problem, Mean-end analysis, Min-Max Search, Alpha-Beta Pruning, Additional refinements, Iterative Deepening.
Planning: [8]
The Planning problem, planning with state space search, partial order planning, planning graphs, planning with propositional logic, Analysis of planning approaches, Hierarchical planning, conditional planning, Continuous and Multi Agent planning

Knowledge representation: [16]
Mapping between facts and representations, Approaches to knowledge representation, Propositional logic, predicate logic, Resolution, Resolution in proportional logic and predicate logic, Clause form, unification algorithm, procedural vs declarative knowledge, Forward vs Backward reasoning, Matching, conflict resolution, Non-monotonic reasoning, Default reasoning, statistical reasoning, fuzzy logic Weak and Strong filler structures, semantic nets, frame, conceptual dependency, scripts.

Introduction to Natural Language processing and expert system: [6]

Recommended Books
1. Elaine Rich  
2. Partick Henry Winston  
   Artificial Intelligence, Addison Wesley, 1990.
3. Stuart J.Russel  
4. George Luger  
   Artificial Intelligence, Pearson Education, Latest Edition
5. DAN, W. Patterson,  
   Introduction to AI and Expert Systems, PHI, latest Edition
   Principles of AI, Narosa publications, latest Edition

Paper Title: Operations Research

Paper Code: EC-816  
Max Marks/credit: 50/3  
Time: 3hrs.

Note for paper setter: Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

PART A
Optimization Problems:  
Linear Programming: Graphical Method (Scope as in Chapter 1 of Reference 1), Solution of simultaneous linear equations: An overview (Scope as in Chapter 2, Sections 2.15 – 2.16 of Reference 1), Basic solutions, lines and hyperplanes, convex sets, extreme points, convex sets and hyperplanes (Scope as in Chapter 2, Sections 2.19 – 2.21 of Reference 1), Reduction of any feasible solution to a system of equations to a basic feasible solution. Simplex Method: The simplex algorithm (Scope as in Chapter 3, 4 of Reference 1), Tableau format for simplex computations, Charnes’s M-method, Two phase method (Scope as in Chapter 5 of Reference 1), The revised simplex method (Scope as in Chapter 7 of Reference 1).

(12 Lectures)
Duality theory: Formulation of the dual problem, Theorems on duality: Weak Duality Theorem, Strong Duality Theorem, Complementary Slackness Theorem, Dual Simplex Algorithm (Scope as in
Chapter 8, Sections 8.1 – 8.12 of Reference 1).

Lectures)

Integer Linear Programming: Branch and Bound Algorithm, Cutting Plane Algorithm (Scope as in Chapter 9, Section 9.1 – 9.2 of Reference 2).

Lectures)

PART B

Transportation Problem:
Initial solution by North-West corner rule, Row minima method, Column minima method, Matrix minima method, Vogel’s method. Tableau of transportation problem, u-v algorithm for solving transportation problem. Degeneracy in transportation problem. (Scope as in Chapter 9 of Reference 1).

The Assignment Problem: Hungarian Method (Scope as in Chapter 5, Section 5.4 of Reference 2).

Lectures)

Traveling Salesman Problem (Scope as in Chapter 9, Section 9.3 of Reference 2).

Lectures)


Lectures)

CPM and PERT: Network representation, Critical path computations, Construction of time schedule, Linear programming formulation of CPM, PERT networks (Scope as in Chapter 6, Section 6.6 of Reference 2).

Lectures)

Basic Queuing Systems: Elements of a queuing model, Pure birth and pure death model, Generalized Poisson queuing model (Scope as in Chapter 17, Section 17.1 to 17.5 of Reference 2).

Lectures)

References:

PART A

Introduction to Physics of the Solid State:

Properties of Individual Nanoparticles:
Introduction to Semiconducting Nanoparticles, Introduction to Quantum Dots, wells, wires, Preparation of Quantum Nanostructures, Introduction to Carbon Nanotubes, Fabrication, Structure, Electrical properties, Vibrational properties, Mechanical properties.

**Biological Materials:**
- Biological Building Blocks, Nucleic Acids, Biological Nanostructures.

**PART B**

**Tools:**
- TEM, Infrared and Raman Spectroscopy, Photoemission and X-RAY spectroscopy, Electron microscopy, SPMs, AFMs, Electrostatic force Microscope, Magnetic force microscope

**Nanoscale Devices:**
- Introduction, Nanoscale MOSFET-planer and non planer, Resonant-tunneling diodes, Single electron transistor, Quantum-Dot, Nano-electrochemical systems, Molecular/Bimolecular electron devices,

**Reference Books:**
1. Nanotechnology: G.Timp, Bell Labs, Murray Hill, NJ(Ed.)
2. Introduction to Nanotechnology-Charless P. Poole, Wiley International

**Paper Title:** Satellite Communications (Theory)

**Paper code:** EC 818  
**Max Marks/credit:** 50/3  
**Time:** 3 hours

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART-A**

**Communication Satellite: Orbit and Description**

**Satellite Sub-Systems**
- Attitude and Orbit Control system, TT&C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

**Satellite Link**
- Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use).

**PART-B**

**Propagation effects**
Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and Ionospheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

**GPS Principles:** History of Navigation, GPS Constellation, Principle of operation, GPS Orbits, Orbital mechanics and Satellite position determination, Time reference, Various DOPs, signal structure, Code and carrier phase measurements, position estimation with pseudorange measurements. GPS applications

**Reference Books:**

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**BUSINESS RESEARCH**

Course : BE-MBA VIII th Semester

**Paper – Compulsory**

*Paper Code: IBM-801  Time: 3 Hours*

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** The course teaches the students the methods of business / marketing research and how to effectively handle research projects

Internal Assessment: 50  
External Assessment: 100

**Part-A**


Measurement and Scaling- Primary Scales of measurement, Comparative Scaling Techniques, Non comparative Scaling techniques-Likert ,Semantic Differential Scale, Stapel Scale, Questionnaire Design- question content, structure and order (10)

**Part-B**

Sampling Design: Meaning and need of Sampling, Probability and non-probability sampling design, simple random sampling, systematic sampling, stratified sampling, cluster sampling and
convenience, sampling, judgement and quota sampling (non-probability), determination of sample size, Hypothesis Testing, Parametric and Non-Parametric Tests. (9)

Discriminant and Logit Analysis- Formulating the problem for Discriminant analysis, Multiple Discriminant Analysis, Logit model. (8)

Factor analysis, Cluster analysis and Multidimensional Scaling - Conducting Factor analysis, Cluster analysis and Multidimensional Scaling- Conjoint Analysis. (8)

2. Marketing Research-Text and Cases, Rajendra Nangundkar, TMH
3. Marketing Research- GC Beri, TMH
4. Marketing Research- Parshuram, Dhruv Grewal, R.Krishnan- Biztantra

FINANCIAL MANAGEMENT

Course: BE-MBA VIII th Semester

Paper – Compulsory

Paper Code: IBM- 802

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: In the course foundation is built for financial analysis. The various aspects of Financial Management are introduced.

Internal Assessment: 50

External Assessment: 100

Part-A

Introduction to Financial Management: Meaning; Scope; Finance Function; Financial Goals; Agency Problem; Relationship of Finance with Accounts and Economics. (4)

Sources of Finance: Features; Advantages and Limitations of Equity Shares; Preference Shares; Debentures; Term-Loans; Right Issue. (3)

Cost of Capital: Meaning; Calculation of Cost of Debt Capital; Equity Capital; Preference Capital; Retained Earnings; Weighted Average Cost of Capital. (6)

Capital Structure: Meaning; Determinants; Assumptions; Net Income and Operating Income Approach; Traditional Position; M-M Position; EBIT and EPS Analysis; Capital Structure and Taxation. (3)
Leverage Analysis: Meaning; Types; Estimation of Financial; Operating and Combined Leverage; Relation of Financial Leverage with Risk and Return. (3)

Management of Working Capital: Meaning of WC; Need of WC Management; Determinants of WC; Operating Cycle; Estimation of WC. (5)

**Part-B**

Inventory Management: Meaning; Need to hold Inventory; Objective of Inventory Management; Inventory Investment Analysis; Inventory Control System. (6)

Capital Budgeting: Meaning; Basic Principles of Costs and Benefits; Investment Criteria; Pay back Method; Accounting Rate of Return Method; Net Present Value Method; Benefit-Cost Ratio; Internal Rate of Return; Capital Rationing; Introduction to Basic Techniques of Risk Analysis in Capital Budgeting. (7)

Dividend Decisions: Meaning and Types of Dividend; Issues in Dividend Policy; Traditional Model; Walter Model; Gordon Model; Miller and Modigliani Model; Bonus Shares and Stock Splits. (8)

**References:**
1. Financial Management, Van Horne ,PHI

**Paper Title: Research Methodology (Theory)**

**Paper code: EC 819**
Max. Marks: 50
Time: 3 hours

**Note for paper setter:** Total of Eight questions may be set covering the whole syllabus taking four from Part A & four from Part B. Candidates will be required to attempt any five questions taking at least two from each Part.

**PART A**

**Introduction to Educational Research** [4]
Concept, types – basic, applied and action, Need for educational research

**Reviewing Literature** [4]
Need, Sources – Primary and Secondary, Purposes of Review, Scope of Review, steps in conducting review.

**Identifying and Defining Research Problem** [5]
Locating, analyzing stating and evaluating problem. Generating different types of hypotheses and evaluating them.
Methods of Research [5]
Descriptive research design - survey, case study, content analysis, Ex-post Facto Research, Correlational and Experimental Research

Sampling Techniques [5]
Concept of population and sample’ sampling techniques - simple random sampling, stratified random sampling, systematic sampling and cluster sampling, snow ball sampling, purposive sampling, quota sampling techniques. Determining size of sample.

PART B
Design and Development of Measuring Instruments [4]
Tests, questionnaires, checklists, observation schedules, evaluating research instruments, selecting a standardized test.

Procedure Of Data Collection [4]
Aspects of data collection, coding data for analysis

Statistical Methods of Analysis [5]
Descriptive statistics: Meaning, graphical representations, mean, range and standard deviation, characteristics and uses of normal curve.
Inferential statistics: t-test, Chi-square tests, correlation (rank difference and product moment), ANOVA (one way), Selecting appropriate methods.

Procedure for Writing a Research Proposal [4]
Purpose, types and components of research proposal.

Procedure for Writing a Research Report [2]
Audiences and types of research reports, Format of research report and journal articles.

Strategies for Evaluating, Research [2]
disseminating and utilizing research – An Overview

Recommended Books:
3. CPSC: Developing Skills in Technician Education Research Modules 1 to 11 Singapore, Colombo Plan Staff College for Technician Education

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NINTH SEMESTER

QUANTITATIVE TECHNIQUES FOR MANAGEMENT

Course : BE-MBA IX th Semester

Paper – Compulsory

Paper Code: IBM-901

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives : The objective of the course is to introduce to the students the quantitative skills required by managers.

Internal Assessment: 50

External Assessment: 100

Part-A

Linear Programming- Equation formulation , Graphical solution of two-variable linear programming problems, Simplex algorithm, Transportation and Assignment problems (8)

Game theory- Game models, zero sum games, dominance rule, 2 x n and m x 2 games, solution of m x n games (8)

Queuing: Single channel single-phase queuing system, multichannel single-phase queuing system, single channel multiphase queuing system (8)

Part-B

Markov Chains ï Markov processes , Markov analysis , input transition probabilities, input conditions, output- specific state probabilities, steady state probabilities, absorbing chains (9)

Simple linear regression and multiple regression analysis (with two independent variables), specification of regression models and estimation of parameters, interpretation of results (6)

Forecasting models- Moving- average forecast methods, Simple Exponential Smoothing, Holt’s method- Exponential Smoothing with trend, Winter’s Method- Exponential Smoothing with Seasonality (10)

1. Business Forecasting : John.E.Hanke , Dean.W.Wichern , PHI
2. Statistics for Managers using Microsoft Excel : Levine, Stephan, Krehbiel, Brenson , PHI

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PROJECT MANAGEMENT & ENTREPRENEURSHIP

Paper Title: Project Management & Entrepreneurship

Paper: Compulsory

Paper Code: IBM-902  Max. Marks 100  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: The course introduces the students to the important aspects of managing a project and skills needed to be an entrepreneur

Part –A

Market and Technical Analysis: Market and Demand Analysis ï Market Survey, Demand Forecasting, Uncertainties in Demand Forecasting; Technical Analysis-Product Mix, Plant Capacity, Materials and Inputs, Machinery and Equipment. (5)

Project Costing and Finance: Cost of project; Cost of production; Break even Analysis; Means of Financing Project; Tax Aspects in Project Finance; Role of Financial Institution in Project Finance. (5)

Project Appraisal: Time Value of Money; Project Appraisal Techniques ï Playback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, Benefit Cost Ratio; Social Cost Benefit Analysis; Effective Rate of Protection. (6)

Risk Analysis: Measures of Risk; Sensitivity Analysis; Simulation Analysis; Decision Tree Analysis. (5)

Project Scheduling/Network Techniques in Project Management: CPM and PERT Analysis; Float times; Crashing of Activities; Contraction of Network for Cost Optimization, Updating; Cost Analysis of Resources Allocation. (7)

Part-B

Entrepreneurial Motivation Theories - Entrepreneurial Competencies ï Developing Competencies ï Role of Entrepreneur. Development Programs ï Assistance Programs for Small Scale Units ï Institutional Framework ï Role of SSI Sector in the Economy ï SSI Units ï Failure, Causes and Preventive Measures ï Turnaround Strategies. (6)

Women Entrepreneurship ï Need ï Growth of women Entrepreneurship ï Problems faced by Women Entrepreneurs ï Development of women Entrepreneurship ï Entrepreneurship in Informal Sector ï Rural Entrepreneurship ï Entrepreneurship in Sectors like Agriculture, Tourism, health case, Transport and allied services. (5)
Institutions for entrepreneurship development, Role of constancy organizations - Role of financial institutions - Bank finance to entrepreneurs, Making a business plan, Entrepreneurship development: Role of Government in supporting entrepreneurship programs in the country. (6)

References:

SUPPLY CHAIN MANAGEMENT

Course: BE-MBA IX th Semester

Paper: Elective-Marketing

Paper Code: IBM-903  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Supply Chain Management has become a critical function for organizations in todayâs competitive world. Students learn the concepts of managing the chain.

Internal Assessment: 50  External Assessment: 100

Part-A

Definition of Supply Chain Management and Logistics - Scope of Transportation, Relationship between transportation and other business functions, Transport Economics: Distance ï volume-density, Freight Cost ï Handling ï Liability - market factors; Third party logistics (3 PL) & fourth party logistics service provider (4 PL), Logistics equipment; Reverse Logistics, Govt. rule & regulations related to Logistics; Documentation related to Transportation :- Bill of Lading, Freight Bill, Claims and F.O.B Terms of Sale, Legal Classification of carriers- Private, Contract carrier etc. (10)

Inventory Control, Planning & Managing Inventories: Strategic role of stock, costs of holding stock, Economic Order Quantity (EOQ), uncertainty in demand and costs, models for known demand: price discount from suppliers, planned shortages and back-orders, models for uncertain lead time demand (8)

Material Handling & Wastage Control; Packing & Packaging; Order Management; Competitive advantage through logistics and supply chain management; Responsive Supply Chain, RFID applications in Supply Chain. (7)

Part-B

Network Design and Facility Location ï Facility location analysis, Optimization models, Heuristic Modeling ï Grid Technique, Information systems for Supply Chain Management- Contemporary Logistics Information Technologies, e-enabled logistics management and tracking systems. (10)
Planning & Sourcing in Supply Chain; Planning demand and supply: Demand forecasting Type and Time horizon of forecast and category of forecasting, aggregate planning; Strategic sourcing; Sourcing decision in Supply Chain- selection of source, technical up-gradation of vendor, vendor performance evaluation, vendor rationalization.

References:
1. Designing & Managing the Supply Chain, Simchi-Levi, David, TMH
2. Inventory Control and Management, Donald Waters, Wiley

SERVICES MARKETING

Course : BE-MBA IX th Semester

Paper: Elective-Marketing

Paper Code: IBM- 904 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: This course introduces the students to important function area of services marketing. Services are intangible in nature and its management is an important part of the marketing portfolio.

Internal Assessment: 50
External Assessment: 100

Part-A
Marketing of services - Introduction - Growth of the Service Sector -The Concept of Service - Characteristics of Services-Classification of Services - Designing the Service-Blueprinting, Using Technology, Developing Human Resources, Building Service Aspirations. (8)
Marketing Mix in Services Marketing - The Seven Ps - Product Decisions, Pricing Strategies and Tactics, Promotion of Services and Placing or Distribution Methods for Services - Additional Dimensions in Services Marketing - People, Physical Evidence and Process. (7)
Strategic Marketing Management for Services - Matching Demand and Supply through Capacity Planning and Segmentation - Internal Marketing of a Service - External versus Internal Orientation of Service Strategy. (10)

Part -B
Quality Standards, Factors and Solutions ï Quality standards in Service delivery, External Communication to the Customer; the Promise versus Delivery Gap - Developing Appropriate and Effective Communication about Service Quality. (4)
Marketing of Services with special reference to (a) Financial Services (b) Health Services (c) Hospitality Services including Travel, Hotels and Tourism. (d) Professional Services (e) Public Utility Services (f) Communication Services (g) Educational Services (10)

References

ADVERTISING AND SALES MANAGEMENT

Course: BE-MBA IX th Semester

Paper: Elective-Marketing

Paper Code: IBM-905

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Advertising and Sales Management are important components of the Marketing strategy of a company. This course introduces the students to these important functions.

Internal Assessment: 50

External Assessment: 100

Part-A

Advertising: As an element in Marketing Mix, its role and importance; Advertising as a means of communication, Setting advertising objectives, DAGMAR approach to setting objectives. Preparing advertising plan, Developing message, writing copy, advertising appeals and per-testing and post-teaching copy

(10)

Media decisions, media strategy and scheduling decisions; Planning and managing advertising campaigns; Different types of advertising, public relations; Industrial advertising; advertising budget and relevant decisions; Advertising agencies; their role and importance; management problems of agencies; client-agency relations; advertising in India, problems and prospects. (15)

Part-B

Sales Management : Size of the sales force, sales organization based on customer, geography, product and combinations and current trends in sales training programs and motivating the sales force in sales force compensation, sales incentives and sales force evaluation in controlling the sales effort in sales quotas, sales territories, sales audit, selecting channel members, setting distribution objectives and tasks in Target markets and channel design strategies. (8)

Product, Pricing and Promotion issues in Channel Management and Physical Distribution - Motivating channel members in Evaluating channel member performance in Vertical marketing systems in Retail co-operatives, Franchise systems and corporate marketing systems. (7)

E-commerce and e-retailing as a channel of distribution, Electronic intermediaries, Disintermediation and Re-intermediation (5)

References:

1. Advertising and Promotion : An integrated marketing communication perspective, George Belch, M.Belch,K.Purani
INDIAN FINANCIAL SYSTEM

Course: BE-MBA IX th Semester

Paper: Elective-Finance

Paper Code: IBM- 906 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: The objective of the course is to introduce the components of Indian Financial System and their working.

Internal Assessment: 50 External Assessment: 100

Part-A

Commercial Banking-Evolution, Financial Services, Fiduciary Services, Off-balance Sheet Activities, Analysis of Assets and Liabilities of Scheduled Commercial Banks; Reserve Bank of India-Central Banking- Introduction to Central Banking, Instruments of Monetary Control, Public Debt, Secondary Debt Market, REPO’s, Reserve Requirements, Selective Credit Controls, Advances to Priority Sector, Supervision System; Regional Rural Banks- Objectives, RBI Assistance, Evaluation of RRB’s.

Cooperative Credit- Introduction, Role of RBI, Organizational Structure, National Bank for Agriculture and Rural Development (NABARD), Reforms in Cooperative Credit.

Non-banking Finance Companies - Introduction, Definition of Non-banking Finance Company, Financial Sector Reform, Liberalization Measures for NBFC’s, Regulations for NBFC’s Accepting Public Deposits, Limits on Acceptance of Deposits, Size of Non-banking Companies, Deposits, Distribution of Deposits, Comparison of NOF and Deposits, Capital Issues by Finance Companies, FCNR Deposits for NBFC’s, Assets of NBFC’s, Investment Norms for NBFC’s, Deployment of Funds, Funds Mismatch of HP/Leasing Companies.

Part-B


References:
1. Indian Financial System ,Markets, institutions and services ,B.V.Pathak, Pearson
2. Indian Financial Systems & Markets , S.Saha, Tata Mcgraw Hill
3. Indian Financial System , M.Y.Khan, Tata Mcgraw Hill

MANAGEMENT OF FINANCIAL SERVICES
Course : BE-MBA IX th Semester

Paper: Elective-Finance

Paper Code: IBM- 907 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Management of Financial Services is an important component of Business Finance. This course introduces the students to this component.

Internal Assessment: 50 External Assessment: 100

Part-A
Financial Services - Meaning, types and their importance, Securities Trading - Online Vs Offline Trading, Demat and Remat, Depository - Introduction, Concept, depository participants, functioning of depository systems, process of switching over to depository systems, benefits, depository systems in India, SEBI regulation. (8)

Insurance Services- Introduction, Principles of insurance, Types of Insurance, Life Insurance Products- Traditional and ULIPs, Credit rating - the concept and objective of credit rating, various credit rating agencies in India and International credit rating agencies, factors affecting credit rating & procedural aspects. (8)

Part-B
Leasing - concept and development of leasing, business, difference between leasing & hire purchase, types of leasing business, advantages to lessor and lessee. (8)

Venture capital - concepts and characteristics of venture capital, venture capital in India, guidelines for venture capital. (7)
Call money market, Treasury bill market, Commercial Bill market, Market for CPs and CDs, Discount market and market for financial guarantees, Factoring - Development of factoring types & importance, procedural aspects in factoring, financial aspects, prospects of factoring in India.

Plastic Money - Concept and different forms of plastic money - credit and debit cards, pros and cons. Credit process followed by credit card organizations. Factors affecting utilization of plastic money in India.

References:
1. Financial services & system, S Gurusamy McGraw-Hill
2. Financial Instruments and services, Nalini P T PHI
3. Financial Services, M Y Khan Tata McGraw-Hill

STRATEGIC FINANCIAL MANAGEMENT

Course: BE-MBA X th Semester

Paper: Elective-Finance

Paper Code: IBM- 908

Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Strategic Financial Management is an important component of the Financial Portfolio. This course explains the working of this component.

Internal Assessment: 50
External Assessment: 100
Course Duration: 45 Lectures of one hour each.

Part-A
Options, Futures and Corporate finance: call options, put options, valuing options, option pricing formula, stocks and bonds as options, capital structure policy and options (8)
Warrants and convertibles: difference between warrants and call options, warrant pricing and Black-Scholes model, value of convertible bonds (5)
Derivatives and Hedging risk: forward contracts and futures contracts, interest-rate futures contracts, duration hedging (9)

Part-B
International Corporate Finance: Foreign exchange markets and exchange rates, law of one price and purchasing-power parity, interest rates and exchange rates, interest rate parity, international bond marketing (11)
References:
1. Mergers, Restructuring and Corporate Control, Weston, Chung, Hoag, PHI
2. Corporate Finance, Ross, Westerfield, Jaffe, TMH

E-COMMERCE

Course: BE-MBA IXth Semester

Paper: Elective-IT

Paper Code: IBM-909  Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: E-commerce has gained tremendous importance in today’s business scenario. Various techniques/methodologies are discussed in this subject.

Internal Assessment: 50  External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Ecommerce terminology: Blogs, Message boards, Newsgroups, Banner Advertising, Spiders/crawlers/robots, hacking, SSL/SET protocols, Escrow, Podcast, webcast, web beacons, spyware, Adware, RSS feed, Spam, Web agents, cookies, search engine, worms (2)

Planning for a Ecommerce: Value chain analysis, SWOT analysis, studying trends and current technology, government incentives, hardware and software assessment for building a web store, intermediaries in Ecommerce (8)

Characteristics of E-Business markets: Various business models, Business model design, pricing and distribution of digital products, bundling, building customer traffic, subscription vs paid model, bricks and clicks business model, call centre integration in ecommerce, affiliate marketing, viral marketing (10)

Part-B

Security in ecommerce transactions: Public key infrastructure, process of getting a digital signature in India, types of digital signatures, role of intermediaries like Verisign (6)

Internet audience: Study of internet audience, online consumer behavior, Online research: Click stream analysis, Search log analysis, emails, pop-ups, online focus group (10)
Online payment systems: On-Line Electronic Cash, Electronic Payment Schemes, Credit card secure electronic transaction, e-cheque, accumulating balance payment system, stored value payment system, digital wallets (9)

References

1. E-commerce Management, Text and cases, Sandeep Krishna Murthy, Cengage
3. Ecommerce, Strategy, Technology and Implementation, Gary.P.Schneider, Cengage
4. Web commerce Technology Handbook, Daniel Minoli, Emma Minoli, TMH

IT PROJECT MANAGEMENT

Course: BE-MBA IX th Semester

Paper: Elective-IT

Paper Code: IBM-910

Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Managing the IT project is critical in delivering the end product. This subject introduces to the students as to how to manage the IT project.

Internal Assessment: 50
External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Software development process: waterfall model, prototyping, spiral model, software configuration management process, process management- capability maturity model (7)

Software requirement analysis and specification: problem analysis, data flow diagram, entity-relationship modeling, decision tables, creating a requirement document (8)

Planning a software project: cost estimation-COCOMO model, schedule and milestones, personnel plan, software quality assurance plans, configuration management plans, project monitoring plans, risk management (6)
Part-B

Function-Oriented design: Modularity, Top-down and bottom-up strategies, structure charts, first-level factoring, design heuristics, Metrics- network metrics, stability metrics, information flow metrics (8)

Object oriented design (OO): classes and objects, encapsulation, inheritance and polymorphism, OO design notation and specification, dynamic modeling, metrics- Weighted Methods per Class (WMC), Depth of Inheritance (DIT), Number of Children (NOC), Coupling between Classes (CBC) (9)

Software testing: error, fault and failure, top-down and bottom-up approaches, test cases and test criteria, functional testing- equivalence class partitioning, cause-effect graphing, structural testing- control based criteria, data flow based criteria (5)

Software delivery: models, managing IT project teams (2)

References:
1. Software Engineering, Ian Sommerville, Addison-Wesley
2. Software Engineering Project Management, R. Thayer, Wiley

DECISION SUPPORT SYSTEMS

Course: BE-MBA IXth Semester

Paper: Elective-IT

Paper Code: IBM- 911  Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: With today’s systems having great computing power, the DSS has assumed even greater significance. This course introduces to the students the criticality of decision making using computers.

Internal Assessment: 50  External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Distinction between Transaction Processing System (TPS), Management Information System (MIS), Expert System (ES) and Decision Support System (DSS) (5)
Architectures of DSS system: components, classifications, backend and front end components of DSS, Web based DSS, Group Decision Support System (GDSS), technologies and infrastructure for group decision making, distributed computing

Modeling for DSS: the decision making modeling process, Intelligence, design and choice phases, design under certainty, risk and uncertainty, sensitivity analysis, what-if, goal-seek and scenario analysis with spreadsheets

DSS design to support operational, tactical and strategic decision making

DSS design methodology for Healthcare, Insurance, Manufacturing and Education sectors

**Part-B**

Enterprise Decision Support System (EDSS): Characteristics and capabilities of EDSS, integrating DSS and EDSS, Computerized systems like CRM, ERP, MRP and their design basics, EDSS and supply chain, Corporate Enterprise portals and their design, Electronic Document Management (EDM) systems

Importance of Knowledge Management Systems (KMS) and its integration with DSS, Design of Knowledge Management System for different sectors, Artificial Intelligence based DSS systems

Reference

1. Decision Support Systems and Intelligent Systems, E.Turban, J.E.Aronson, Pearson

**TRAINING AND DEVELOPMENT**

Course: BE-MBA IX th Semester

**Paper: Elective-HR**

*Paper Code: IBM-912*  
*Time: 3 Hours*

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** Training and development is an important component of the HR portfolio. This course introduces the students to the importance of designing good training systems.

Internal Assessment: 50  
External Assessment: 100
Part-A
National Training Interventions: Training as an economic instrument, achievements and challenges, National initiatives: 1964 to the present day, the European scene, which way forward. (4)

Attitudes Towards Education and training: Education, training and work, changes in attitudes to training and development, Philosophies of training. Learning and Training: What do we understand by learning, Reinforcement theories, cybernetic and information theories, cognitive theories and problem solving, experimental learning, Learning to learn and self-development, Mental process, other horizons. (8)

The Learner and the Organization: The learner, the organization as a learning environment, the learning organization. Approaches to Training Interventions: Organization learning systems, Generalized approaches, Planned training interventions, the costs and benefits of training interventions. (10)

Part-B
The Training Function in Organizations: The training function, Management's responsibility for training, Creating and appropriate structure, The training of training staff, Ethical standards (4)

Assessing Organizational Training Needs: The levels of organizational needs, types of organizational reviews, before starting the review, reasons for an organizational review, carrying out an organization-wide review. (4)

Training Policy, Plans and Resources: Training policy, policy development, annual training plan, training resources, from policy to training plan and budget, Assessing Training Needs-the job and the individual: Job training analysis, Analytical techniques, Carrying out an individual training needs analysis, assessing performance. (10)

Determining and evaluating training interventions: Training interventions, determination of training objectives, determination of the appropriate training strategy, planning and implementation of the training, evaluation of the programme. (5)

References:
1. Effective training, systems, strategies and practices, P.N.Blanchard, J.W.Thacker, V.A.Ram, Pearson

ORGANIZATIONAL CHANGE AND DEVELOPMENT STRATEGIES

Course: BE-MBA IX th Semester

Paper: Elective-HR

Paper Code: IBM-913

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus.
Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** Organization change is important in today’s rapidly changing world. This course equips the students with techniques to manage change effectively.

Internal Assessment: 50        External Assessment: 100

**Part-A**


Values, Assumption, And Beliefs in OD- Chronology of Events in Management and organization Thought, early Statement of OD values and assumptions, A Values Study. (3)


OD Interventions :Thinking about OD Interventions, Classifying OD Interventions. (4)

**Part-B**


Intergroup and Third-Party Peacemaking Interventions :Intergroup Team-Building Interventions, Third party Peacemaking Interventions ,organization Mirror Interventions, Partnering. (7)


**References:**

1. Organization development and transformation üManaging effective change , W.French,C.Bell, R.Zawacki

INDUSTRIAL PSYCHOLOGY

Course : BE-MBA IX th Semester

Paper: Elective-HR

Paper Code: IBM-914

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Industrial psychology equips the students with techniques / methodologies for handling this component in organization.

Internal Assessment: 50        External Assessment: 100

Part-A

Nature and scope of Industrial Psychology: Psychology and management, contributions of Freud and post Freudian development of Psychology

Factory organization: industrial bureaucracy, formal and informal groups, status system, balancing of social power, union and employer’s organizations

Psychology of leadership, understanding and motivating employees, industrial morale and job satisfaction, counseling, Psychology of industrial conflict, stress management

Part-B

Personality: Idiographic approach, Nomothetic approach, psychoanalytical perspectives, levels of awareness, defence mechanism, projective tests, Rorschach test, Thematic Appreciation Test (TAT), Role playing or visualization, stereotyping, brand personality

Trait perspective: Allport’s trait categories, Catell’s 16 PF test, personality tests, personality questionnaire, Type perspective- four humours, Sheldon’s typology, Eysenck’s typology, Factor theory, Jung’s typology, Allport’s typology

Intelligence: models, Stanford-Binet intelligence scale, Wechsler scale, Emotional intelligence

References:

1. Psychology in Organizations, S. Alexander Haslam, Sage publications

SUMMER TRAINING

Course: BE-MBA IX th Semester

Paper: Compulsory

Paper Code: **IBM-915**

**Objective:** To expose the student to working of business functional areas in corporate / organizations.

Internal Assessment: 200

The students would submit a report of the summer training and give viva-voce for the same.

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TENTH SEMESTER

STRATEGIC MANAGEMENT

Course : BE-MBA X th Semester

Paper – Compulsory

Paper Code: IBM-1001

Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Strategic Management assumes great importance in today’s world of managing resources. This course introduces the students to this important component.

Internal Assessment: 50
External Assessment: 100
Course Duration: 45 Lectures of one hour each.

Part -A
Definition, nature, scope, and importance of strategy; and strategic management (Business policy), Strategic decision-making. Process of strategic management and levels at which strategy operates, Role of strategists, Defining strategic intent: Vision, Mission, Business definition, Goals and Objectives. (6)
Environmental Appraisal Concept of environment, components of environment (Economic, legal, social, political and technological).
Environmental scanning techniques- ETOP, QUEST and SWOT (TOWS) PEST. (7)
Internal Appraisal The internal environment, organizational capabilities in various functional areas and Strategic Advantage Profile. Methods and techniques used for organizational appraisal (Value chain analysis, Financial and non financial analysis, historical analysis, Industry standards and benchmarking, Balanced scorecard and key factor rating). Identification of Critical Success Factors (CSF). (8)

Part -B
Strategic Analysis and choice Corporate level analysis (BCG, GE Nine-cell, Hofer’s product market evolution and Shell Directional policy Matrix), Industry level analysis, Porters’s five forces model, Qualitative factors in strategic choice. Strategy implementation: Resource allocation, Projects and Procedural issues. (8)
Strategic Management of Technology and Innovation- Licensing new technology, imbibing new technology, searching for strategic partners in new business areas, Internal and external sources of technology , linking new technology and novel customer needs ,building competence through new product development, technological innovation and strategy (8)
Recommended Text Books

GLOBAL MARKETING

Course : BE-MBA Xth Semester

Paper: Elective-Marketing

Paper Code: IBM-1002 Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: With global trade increasing many fold global marketing has assumed great importance. This course introduces the students to this important aspect.

Internal Assessment: 50 External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Global Marketing: Development of Global Marketing, market characteristics, Industry conditions, marketing infrastructure, regulatory framework, basis for trade- absolute vs comparative advantage, protectionism and trade restrictions, tariffs, quotas, GATT (8)

Selecting markets: list of selection criteria, market index for country selection, grouping global markets, consumer market, business market and government market, categorizing global marketing mindsets, global market entry strategies- exporting, local production, ownership (10)

Pricing for global markets: transportation cost, tariffs, taxes, local production costs, channel costs, market and environmental factors affecting price, determining transfer prices, dealing with parallel imports or gray markets, sources of finance- commercial banks, government sponsored financing (8)

Part-B

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Developing new products for global markets: three strategic choices – extension, adaptation, invention, role of foreign subsidiaries in R&D, acquisitions as a route to new products, joint venture route to new products, concept test, test marketing (7)

Developing a global distribution strategy: distribution density, channel length, channel alignment, distribution logistics, locating and selecting channel partners (6)

Planning and controlling global marketing: selecting control metrics, resolving conflicts between headquarters and subsidiaries (6)

References:

2. Global Marketing, Johny K.Johansson, TMH

CONSUMER BEHAVIOR

Course: BE-MBA X th Semester

Paper: Elective-Marketing

Paper Code: IBM- 1003 Time: 3 Hours

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Consumer behavior makes us aware about how consumers think and act. This knowledge can be used to make more informed decisions.

Internal Assessment: 50 External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Current trends in Consumer Behavior (CB), Consumer empowerment through the web, Information bank for understanding CB, consumer need arousal, need recognition, consumer Psychological set, consumer information search and processing, Brand evaluation, Purchase and post purchase behavior (9)

Consumer learning, Habit and Brand Loyalty, unplanned purchase behavior, strategic implications of low-involvement decision making, situational influences, use of situational variables in marketing strategy, consumer perception, perception interpretation, price perception, Attitude development for change, lifestyle and personality (10)

Part-B
Group and culture influences, culture values, cross-culture values, subculture influences, reference group influences, House-hold decision making, group communication ï word of mouth as diffusion process, Market segmentation and Micromarketing (9)

Marketing communication process ï source effects in marketing communication, message effects, media effects, consumer decoding of marketing communication, Alternatives evaluation and selection- how consumers make choices, evaluation criteria , decision rules for Attribute based choices (10)

Consumer Rights and Social responsibility (7)

1. Consumer Behavior ï Insights from Indian Market, Majumdar, PHI
2. Consumer Behavior ï A Strategic Approach , Henry Assael , Biztantra (Dreamtech)

INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

Course : BE-MBA X th Semester

Paper: Elective-Finance

Paper Code: IBM- 1004 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Investment analysis and Portfolio management are important aspects of Financial Management. This course equips the students with the knowledge base to make informed decisions. Internal Assessment: 50 External Assessment: 100

Part-A


Risk and Return: Concept of Risk, Components of Investment Risk, Measurement of Risk through Standard Deviation, Regression Equation, Covariance, Concept of Return, Expected Yield, Actual Yield, Holding Period Yield, Relationship between Risk and Return (5)


Company Analysis: Meaning of Company Analysis, Strategy Analysis, Accounting Analysis, Financial Analysis, and Estimation of Intrinsic Value. (3)


**Part-B**

Portfolio Theory: Merits of Diversification: Diversification and Portfolio Risk, Portfolio Return and Risk, Calculation of Portfolio Risk, Efficient Frontier for two securities, Efficient Frontier for n-securities, Optimal Portfolio. (4)

Portfolio Analysis: Concept of Traditional and Modern Portfolio Analysis, Markowitz Theory Risk – Return Optimisation, Single Index Model, Beta Generation in Efficient Frontier, Three securities Model, Interactive Risk through Covariance, Correlation Co-efficient, Sharpe’s Model. (5)

Portfolio Selection: Concept of Portfolio Selection, Optimal Portfolio, Objectives, Risk and Investor Preferences, Investment Constraints, Cut-off Rate and New Securities, Efficient Frontier and Portfolio Selection, Beta, Traditional Portfolio Building, Capital Market Theory, CAPM, SML, Forms of CAPM, Zero Beta CAPM, Tax adjusted CAPM, Arbitrage Pricing Theory. (6)

Portfolio Revision: Meaning, Need, Techniques of Portfolio Revision, Formula Plans, Rules Regarding Formula Plans, Constant Rupee Value Plan, Constant Ratio Plan, Variable Ratio Plan, Modifications, Rupee Averaging Technique. (5)


2. Investment Management - Lofthouse, Stephen, John Wiley & Sons Publications

**INTERNATIONAL FINANCIAL MANAGEMENT**

Course : BE-MBA X th Semester

**Paper: Elective-Finance**

*Paper Code: IBM- 1005*  
*Time: 3 Hours*

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: This course introduces the important aspects of International Financial Management. It equips the students with knowledge base important to take effective decisions.

Internal Assessment: 50  
External Assessment: 100
Part-A
Global Financial markets and interest rates: domestic and offshore markets, Euromarkets, Interest rates in the global money markets, money market instruments (6)
Foreign exchange market: types of transactions and settlement dates, exchange rate quotations and Arbitrage, exchange rate determination and forecasting (6)
Forwards, Swaps and Interest parity: Swaps and deposit markets, interbank forward dealing, option forwards, Exchange Rate Agreements and Foreign Exchange Agreements (FXA), Forward currency markets in India (10)

Part-B
Currency and Interest rate futures: futures contracts, markets and trading process, future prices expected spot prices and forward prices, option pricing models, Over the Counter (OTC) market prices (8)
Hedging, Speculation and Management of Transaction exposure: Hedging with money market, currency options, currency futures, internal hedging strategies (8)
Management of Interest Rate Exposure: Forward Rate Agreements (FRAs), Interest (7)

References:
1. International Financial Management ,P.G.Apte , Tata McgrawHill
2. Multinational Financial Management , Shapiro, Wiley

ERP

Course : BE-MBA  X th Semester

Paper: Elective-IT

Paper Code: IBM- 1006  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: With the organizations integrating their operations ERP assumes great importance. This paper introduces this important aspect.

Internal Assessment: 50  External Assessment: 100

Part-A

ERP Package selection : Need assessment ,Justifying ERP implementation, cost benefit analysis, ERP package evaluation and selection, make or buy decision (8)
ERP systems development process: ERP implementation life cycle, planning, requirement analysis, reengineering vs customizing, transition strategies- big bang, phased, parallel, hybrid, implementation-hidden costs (8)
ERP systems: Sales and Marketing- sales and distribution, sales forecasting, product pricing systems, billing systems ERP and Customer Relationship Management (CRM), Accounting and Finance- cash management process, capital budgeting process, financial accounting and management accounting Production and Materials management- MRP system, capacity planning process, manufacturing execution systems ,Human Resources-compensation and benefits administration

Part-B

Managing an ERP project: Risks in ERP implementation, managing large scale ERP projects, project team selection, user training, technological challenges, operation and upgradation issues

Role of consultants and vendors: maintenance of ERP system, future trends and directions in ERP, open source ERP systems

References

1. Enterprise Resource Planning, Mary Sumner, Pearson
2. Enterprise Resource Planning, Alexis Leon, TMH
3. Class A ERP Implementation- Integrating Lean and 6 sigma, S.Donald, Cengage India

DATA WAREHOUSING & DATA MINING

Course: BE-MBA Xth Semester

Paper: Elective-IT

Paper Code: **IBM-1007**  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: With high computing power available at low cost Data Warehousing and Data Mining assumes great importance. This subject introduces the basics of this important aspect.

Internal Assessment: 50  External Assessment: 100

Part-A

Data Warehousing (DW): components of DW, DW and data marts, planning for DW, specifying business requirements, DW and Meta Data, dimensional modeling, slowly changing dimensions type1, 2 and 3, factless fact tables, aggregate fact tables, data extraction, transformation and loading (ETL), ETL tools, indexing the DW, DW and OLAP
Data mining: preprocessing data for data mining, descriptive data summarization, data cleaning, prediction modeling with simple linear regression and multiple regression, logistic regression (8)

Classification data mining modeling: classification by decision tree induction, tree pruning, Bayesian classification, classification by back propagation in Neural networks (8)

Part-B

Mining frequent patterns and associations: market basket analysis, Apriori Algorithm, web mining, web log analysis, text mining (7)

Cluster analysis: interval scaled variables and binary variables, cluster analysis by partitioning, hierarchical methods, density based methods, clustering based on distance (8)

Open source data mining software and proprietary software (2)

References:

1. Data Mining – Concepts and Techniques, J.Han, Micheline Kamber, Elsevier
2. Data Mining – Methods and Models, Daniel T.Larose, Wiley
3. Data Mining- Galit Shimuli, Wiley

STRATEGIC HUMAN RESOURCE MANAGEMENT

Course: BE-MBA X th Semester

Paper: Elective-HR

Paper Code: IBM-1008 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Strategic Human Resource management is an important aspect of the HR portfolio. This is because of globalization of organizations assuming importance in today’s world.

Internal Assessment: 50 External Assessment: 100

Part-A

Introduction to Strategic Human Resource Issues, Challenges of Career development, Diverse work force development, self development, Pay-for-performance systems, Types of Pay-for-performance plans- individual based, team based, plant wide and corporate level (10)
Hofstede’s cultural orientation model, FIRO-B questionnaire, Johari Window questionnaire, HR metrics and importance, Factor analysis in HR Research, competency mapping models and framework

Part-B

Determining the mix of Host-country and expatriate employees, the challenges of expatriate assignments, selective training, career development and compensation of expatriate employees, developing a global HR system and pay system, international staffing managing diversity, offshoring, equal employment opportunities, repatriation problems and solutions, HR strategies and orientation for Mergers

Managing employee separation, Downsizing and outplacement, cost and benefits of employee separation, types of early separation (voluntary and Involuntary), features of early retirement policies, managing layoffs, alternatives to layoffs, the goals of outplacement.

3. Human Resource Research methods, Dipak Kumar Bhattacharyya, Oxford

MANPOWER PLANNING & PERFORMANCE APPRAISAL

Course: BE-MBA X th Semester

Paper: Elective-HR

Paper Code: IBM- 1009

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: Manpower planning and performance appraisal are critical aspects of future planning as far as employees are concerned. This subject deals with this important aspect.

Internal Assessment: 50
External Assessment: 100

Part-A

Manpower planning: setting up objectives, aligning manpower planning with strategic business goals, Role analysis, job analysis, job specification, job description
Recruitment and selection: recruitment and legislation, fair employment practices, recruitment, hiring procedure, forecasting human resource requirements, managing growth and replacement of top executives

Part-B

Performance appraisal: need for performance appraisal, parameters of performance appraisal, computerized performance appraisal systems, self appraisal questionnaire, 360 degree performance appraisal systems


References:

SEMINAR

Course: BE-MBA Xth Semester

Paper: Compulsory

Paper Code: IBM-1010

Course Duration: 45 hours

Internal Assessment: 100 marks

The students are required to prepare and deliver a presentation to the class on a given topic. The topic will be related to current business scenario / specialization area.

Presentation - 30 minutes

Question Hour session - 10 minutes

The student will be evaluated on the basis of Presentation content, Communication ability and handling questions.

MINOR PROJECT

Course: BE-MBA Xth Semester

Paper: Compulsory
Paper Code: **IBM-1011**

Course Duration: 45 hours

Internal Assessment: 100 marks

The students are required to prepare a minor project on the topic allotted to them. The topic will be allotted by consultation with the student in the area of specialization.

The student is required to submit the report in the following format:

a) Problem statement  
b) Literature review  
c) How to solve the problem  
d) Research methodology  
e) Data sources identified  
f) Data collection  
g) Statistical analysis  
h) Results  
i) Shortcomings