DR APJ ABDUL KALAM UNIVERSITY, INDORE

Scheme of Examination
B.Sc.
Semester-VI
(w.e.f. July 2016 Onwards)

(Non Grading)

Course Name	Subject	Theory Max. Marks				Practical Max Marks		Total
		Internal		External		Max Marks	Min Marks	
		Max	Min	Max	Min			
Foundation Courses	HINDI+ ENGLISH **FCS 601 HE**	10+05= 15	05	50+35=85	28	-	-	100
	Basics of Computer & Information Technology – II **FCS 602 EP**	15	05	35	12	-	-	50
B.Sc Computer Science	COMPUTER SCIENCE **BSS 601 T**	15	05	85	28	50	17	100
	COMPUTER SCIENCE **BSS 601 P**	-	-	-	-	50	17	50
	PHYSICS **BSP603 T**	15	05	85	28	50	17	100
	PHYSICS **BSP603 P**	-	-	-	-	50	17	50
	MATHEMATICS **BSM 601 T**	25	08	125	42			150
Total								600

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - VI Semester

Subject: - Computer (BSS 601T)

Paper: - Computer Networks

Marks 85+15 CCE

UNIT-I:

Computer Network, Goals and applications, Reference models-OSI & TCP/IP- A Comparative study. Network hardware- LAN, MAN & WAN and Topologies, LAN components – File server, Workstations, Network Adaptor cards, Connection oriented and connection less services.

UNIT-II

Data Communication System, Data Communication Links, Character codes, Digital Data rates, Serial Data formats, Encoded data formats, Error detection and correction. Transmission media – guided and unguided media, Switching Techniques – Circuit Switching, Packet Switching, Message Switching.

UNIT-III

Data Link Protocol, Character Oriented Protocol & Bit Oriented Protocol, Network architecture protocol, Ethernet, Token bus and Token Ring.

UNIT-IV

Internet basics- Elements of the web, viewing web pages with a browser, using a browser for a mail, news and chat, security and privacy issues. Internet: advantage & disadvantage. Internet Services, Web server and Proxy server, Web caches, web browser like internet explorer, netscape navigator and communication suite, internet security issues, embedded and software based firewall, data encryption and digital signature and certificates.

UNIT-V

The art of creating the web site and home page, the HTML programming basics, syntax & rules, tables, frames, forms, example of HTML page, choice of color, banners, linking with HTML page, Div, Span, met tags, Introduction to DHTML, Java script, use of java script, Java script syntax, Data type, Array, Variable, Operator & Expressions.

Text Books:

1. Data and Network communication by Michael A. Miller..

Reference Books:

1. Deitel and Deitel, Goldberg, “Internet and World Wide Web – How to program,” Pearson education Asia, 2001.
2. “Computer Networks”, A. S. Tanenbaum.

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - VI Semester

Subject: - Computer (BSS 601P)

Practical Exercise on Computer Networks)

1. Create a webpage that prints your name to the screen.
2. Create a webpage that print the numbers 1-10, each number being a different color
3. Print a paragraph with 4-5 sentences .Each sentence should be a different font.
4. Print two lists with any information you want. One list should be an ordered list; the other list should be an unordered list.
5. Print a paragraph that is a description of a book; include the title of the book as well as its Auther. Names and titles should be underlined, adjectives should be italicized and bolded
6. Print some performatted text of your choosing
7. Create a page with a link at the top of it that when clicked will jump all the way to bottom of the page. At the bottom of the page there should be a link to jump back to the top of the page
8. Display an image that has a border of size 2,a width of 200 and a height of 200.
9. Display five different images. Skip two lines between each image .Each image should have a title.
10. Display an image that when clicked will link to a search engine of your choice
11. Add a simple table to for storing Train information(Train no, Name, Source, Destination, Time)without borders .Do the following
    1. Add border value of 1, save and view.
    2. Add a border value of 5,save and view.
    3. Make the top row a table header, save and view
    4. Align all data elements to the middle of their cells, save and view.
    5. Divide Time into Departure Time, Arrival Time.
12. Write a java Script, which calculates sum or product depending on the drop down menu selection of two numbers; accepted using textbox and display the result in the third textbox. The action performs on click event on button.
13. Write a Java script which display current date and time when page loads
14. Write a Java script that prompt the user for his or her name as the page load(via dialog box) and then welcome the user by name in the body of the page
15. Create a webpage using two image files, which switch between one another as mouse pointer mover over the images.
16. Write a java script, which calculates factorial of a number, accepted using textbox and displays the result in second textbox. The action performs on click event on button.
17. Write a java script which reverses the number accepted in text box.
18. Create an HTML form which has number of text boxes like first name, last name, address & PIN code. Write a Java script code to verify following on click event of a button.

1. Pop up an alert indicating which text box has left empty and set focus on that specific text box.
2. Give message “Thanks you” if all text boxes are filled.
3. Pop Up an alert message if text within PIN code is not numeric value and greater than 6 digits and set focus on it till it is given proper value.

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - VI Semester

Subject: - Physics (BSP 603T)

Paper: - SOLID STATE PHYSICS AND DEVICES

Marks 85+15 CCE

Unit-I: SOLID STATE PHYSICS-1

Crystal Structure and bonding: Crystalline and amorphous solids. Translational symmetry. Lattice and basis. Unit cell. Reciprocal lattice. Fundamental types of lattices (Bravias Lattice). Miller indices Lattice planes. Simple cubic. Face centered cubic. Body centered cubic lattices. Laue and Bragg's equations. Determination of crystal structure with X-rays, X-ray spectrometer. Ionic, covalent, metallic, van der Waals and hydrogen bonding. Band theory of solids. Periodic potential and Bloch theorem. Kronig-Penny model (Qualitative).

Unit-II: SOLID STATE PHYSICS-2

Lattice structure and properties: Dulong Petit, Einstein and Debye theories of specific heats of solids. Elastic and atomic force constants. Dynamics of a chain of similar atoms and chain of two types of atoms. Optical and acoustic modes. Electrical resistivity. Specific heat of electron. Wiedemann-Franz law. Hall effect. Response of substances in magnetic field, dia-, para- and ferromagnetic materials. Classical Langevin theory of dia and paramagnetic domains. Curie's law. Weiss' theory of ferromagnetism and ferromagnetic domains. Discussion of BH hysteresis.

Unit-III: SEMICONDUCTOR DEVICES-1

Electronic devices: Types of Semiconductors (p and n). Formation of Energy Bands, Energy level diagram. Conductivity and mobility. Junction formation, Barrier formation in p-n junction diode. Current flow mechanism in forward and reverse biased diode (recombination), drift and saturation of drift velocity. Derivation of mathematical equations for barrier potential, barrier width. Single p-n junction device (physical explanation, current voltage characteristics and one or two applications). Two terminal devices. Rectification. Zener diode. Photo diode. Light emitting diode. Solar cell. Three terminal devices. Junction field effect transistor (JFET). Two junction devices. Transistors as p-n-p and n-p-n. Physical mechanism of current flow. Characteristics of transistor.

Unit-IV: SEMICONDUCTOR DEVICES-2

Amplifiers (only bipolar junction transistor). CB, CE and CC configurations. Single stage CE amplifier (biasing and stabilization circuits), Q-point, equivalent circuit, input impedance, output impedance, voltage and current gain. Class A, B, C amplifiers (definitions). RC coupled amplifiers (frequency response). Class B push-pull amplifier. Feedback amplifiers. Voltage feedback and current feedback. Effect of negative voltage series feedback on input impedance. Output impedance and gain. Stability, distortion and noise. Principle of an Oscillator, Barkhausen criterion, Colpitts, RC phase shift oscillators. Basic concepts of amplitude, frequency and phase modulations and demodulation.

Unit-V: NANO MATERIALS

Nanostructures: Introduction to nanotechnology, structure and size dependent properties. 3D, 2D, 1D, 0D nanostructure materials and their density of states, Surface and Interface effects. Modelling of quantum size effect. Synthesis of nanoparticles - Bottom Up and Top Down approach, Wet Chemical Method. Nanolithography. Metal and Semiconducting nanomaterials. Essential differences in structural and properties of bulk and nano materials (qualitative description). Naturally occurring nano crystals. Applications of nanomaterials.

References:

1. Introduction to Solid State Physics, C. Kittel, VIIIth Edition, John Wiley and Sons, New York, 2005.
2. Intermediate Quantum theory of Crystalline Solids, A. O. E. Animalu, Prentice−Hall of India private Limited, New Delhi 1977
3. Solid State Physics, N. W. Ashcroft, and N. D. Mermin, Harcourt Asia (P) Ltd. 2001
4. The Physics and Chemistry of Nanosolids: Frank J. Owens, and Charles P. Poole Jr., Wiley Inter Science, 2008
5. Physics of Low Dimensional Semiconductors: An introduction; J.H. Davies, Cambridge University Press, U.K., 1998

Dr. APJ Abdul Kalam University Indore

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - VI Semester

Subject: - Mathematics (BSM 501T)

Paper: - Real Analysis, Discrete Mathematics and Optional

Unit-I

Riemann integral, Algebra of Riemann integrable functions, Integrability of continuous Unit-1 and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus

Unit-II

Definition and examples of metric spaces, Neighbourhoods, Limit points, Interior points, Open and closed sets, Closure and interior, Boundary points, Subspace of a metric space, Cauchy sequences, Completeness, Cantor's intersection theorem, Contraction principle, Real numbers as a complete ordered field, Definition of Continuous functions and its illustrations.

Unit-III

Algebra of Logic, Tautologies and Contradictions, logical equivalence, Algebra of Unit-3 propositions, Quantifiers: Universal and Existential Quantifiers, Boolean Algebra and its properties, Demorgan's law, Algebra of Electric circuits and its applications.

Unit-IV

Boolean Function, Disjunction and Conjunction Normal Forms, Bools Expansion Theorem. Binary Relations, Equivalence Relations, Partitions and Partial Order Relation.

Optional

This unit should be different from the main subject/paper studied during Semester I to Semester VI.

Graph Theory

Unit-V

Graphs, Multigraphs, Weighted Graphs, Paths and Circuits, Shortest Paths: Dijkstra's Algorithm, Matrix Representation of Graph: Incidence and Adjacency Matrix, Trees And its simple properties.

Or

Elementary Statistics

Probability, Continuous probability, probability density function and its applications (for finding the mean, mode, median and standard deviation of various continuous probability distributions) Mathematical expectation, expectation of sum and product of random variables,

Moment generating functions, Theoretical distribution: Binomial, Poisson distributions and their properties and uses.

Or

PRINCIPLES OF COMPUTER SCIENCE

Data Storage of bits Ram Memory. Mass storage. Coding Information of Storage. The Binary System Storing integers fractions, communication errors. Data Manipulation – The Central Processing Unit The Store Program concept. Programme Execution,
Anthmetic/Logic Instruction. Computer-Peripheral Communication. Operation System : The Evolution of Operating System. (Dos, Window) Operating System Architecture. Coordinating the Machine's Activities. Other Architectures.

Or

MATHEMATICAL MODELING

The process of Applied Mathematics. Setting up first order differential equations. Qualitative solution sketching. Stability of solutions. Difference and differential equation models of growth and decay. Single species population model, Exponential and logistic population models.

Text Books:

1. R.R Goldberg, Real Analysis, Oxford & IBH Publishing Co., New Delhi, 1970.

2. G.F. Simmons. Introduction to Topology and Modem Analysis. McGraw-Hill, 1963.

3. T.M Apostol, Mathematical Analysis. Norosa Publishing House. New Delhi, 1

4. C.L. Liu,Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science scries 1986.

5 म.प्र हिन्दी ग्रंथ अकादमी की पुस्तकें ।

Reference Books:

1. T.M Apostol, Mathematical Analysis. Norosa Publishing House. New Delhi, 1985.

2. S. Lang. Undergraduate Analysis, Springer-Veriag, New York, 1983.

3. D. Somasundaram and B. Choudhary, A first Course in Mathematical Analysis. Narosa Publishing House, New Delhi 1997.

4. Shanti Narayan, A Course of Mathematical Analysis. S. Chand & Co. Delhi.

5. RK. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi 2000.

6. P.K. Jain and K. Ahmed Metric Spaces, Narosa Publishing House, New Delhi, 1996.
7. S. Lang, Undergraduate Analysis, Springer-Verlag, New York 1983.
8. E.T. Copson, Metric Spaces, Cambridge University Press, 1968
9. S. Lang. Undergraduate Analysis, Springer-Veriag, New York, 1983.

Optional Papers

1. Graph Theory

Text Book:

1. Narsingh Deo : Graph Theory, McGraw Hill.
2 म.प्र हिन्दी ग्रंथ अकादमी की पुस्तकें ।

2. Elementary Statistics

Text Book:

1. Statistics by M. Ray
2. Mathematical Statistics by J.N Kapoor, H.C Saxena (S. Chand)
3. म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें।

References Book:

Fundamentals of Mathematical Statistics, Kapooor and Gupta

3. Principles of Computer Science

Text Book:

1. J. Glen Brokkshear, Computer Science: An Overview, Addition- Wesley.
2. Stanley B. Lippman, Josee Jojoie. C++ Primer)3rd Edition), Addision- Wesley Total at least ten practicals
3 e-iz- fgUnh xzaFk vdkneh dh iqLrdsaA

4. Mathematical Modeling

Text Book:

1. Kapoor, J.N. : Mathematical models in Biology and Medicine. EWP (1985)\
2. SAXENA V.P. : Bio-Mathematical an introduction, M.P. Hindu Growth Aradamy 1993
3. Martin Braun C.S. Coleman, DA Drew (Eds.) Differential Equation Models.
4. Steven J.B. Lucas W.P., Straffin B.D. (Eds.) Political and Related Models, Vol. 2
5 म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें।
1. Cullen Linen Models in Biology.
2. Rubinoe, SI : Introduction yo Mathematical Biology. John Wiley and Sons 1975.