

MANGALORE UNIVERSITY

I Semester BSc (Computer Science) – Blown Up Syllabus

2019-2020 Onwards

BSCCSC 131: Digital Computer Fundamentals

Topic	Books and pages
UNIT - I	
<p>Introduction to Computer Systems: Introduction, Characteristics of Computers, Evolution of Computers, Generations of Computers, Classification of Computers, Computer System, Application of Computers.</p>	<p>Book 1 Chapter 1</p>
<p>Primary Memory- Introduction, memory representation, Memory hierarchy, RAM, Types of RAM- SRAM and DRAM, ROM- types of ROM.</p>	<p>3.1 to 3.4</p>
<p>Secondary Memory- Introduction, Classification of secondary memory, Magnetic disk, Optical disk.</p>	<p>3.6, 3.8, 3.9, 3.9.2, 3.9.4, 3.9.5, 3.10 (Excluding 3.10.1, 3.10.2), 3.11, 3.11.4, 3.11.5</p>
<p>Input devices – Type of input devices. [Keyboard and Mouse (Both with working principles), Introduction to Trackball, Joystick, Lightpen, Touch Screen, Scanners, OCR, OMR, MICR and Barcode reader (Working principles excluded)].</p>	<p>4.2, 4.2.1, 4.2.2, 4.2.6 to 4.2.10</p>
<p>Output devices- types of output devices. [Printers – Dot matrix, Inkjet and Laser printers (three with working principle), Monitor – Resolution, Dotpitch, Refresh Rate, Introduction to Cathode Ray Tube (CRT) Monitor and Liquid Crystal Display (LCD) Monitor (Working principles excluded). Differences between LCD and CRT, Other types of monitors].</p>	<p>4.3, 4.3.1, 4.3.4</p>
UNIT - II	
<p>Number Systems: Binary numbers, Number base conversions, Octal and hexadecimal numbers, Complements, Binary codes.</p>	<p>BOOK 2 : Page 3 - 20</p>
<p>Boolean Algebra and Logic Gates: Basic Definitions, Basic Theorems and properties of Boolean Algebra, Boolean Functions, Algebraic Manipulation, Canonical and Standard forms, Other Logic Operations and Digital Logic Gates.</p>	<p>Page 31 - 54(Except Venn diagram) Page 65 - 72 Page 75-77</p>
<p>Simplification of Boolean Functions: Karnaugh Map method for 2, 3 and 4 variable expressions, Product of Sums Simplification.</p>	
UNIT III	
<p>Universal gates, NAND and NOR implementation, Don't Care Conditions.</p>	<p>BOOK 2: Page 77-83, 117-119 (Universal gates)</p>
<p>Combinational Logic: Adders, Subtractors, Code conversion, Exclusive-OR and Equivalence functions.</p>	<p>Page 105, 117, 124-133</p>
<p>Combinational Logic with MSI and LSI: Binary parallel adder, Decimal adder, Magnitude comparator (only 2 bits), Decoders, Encoders, Demultiplexers, Multiplexers</p>	<p>Page 136-140 Page 143-157</p>

UNIT IV

Sequential Logic: Introduction, Flip-flops, RS flip-flop, D flip-flop, T flip-flop, JK flip-flop, Triggering of flip-flops, Analysis of clocked sequential circuits, Flip Flop excitation tables, Design Procedures, Design of counters using JK and T flip flops, Design with state equations.

Registers, Counters:

Introduction, Registers, Shift registers, Ripple counters, Synchronous Counters.

BOOK 2 :
Page 179-197
Page 204-211
Page 215 – 223

Page 229-253

Books:

1. ITL Education Solution Limited, **Introduction to Information Technology**, Pearson Education, 2012
2. M. Morris Mano, Digital Logic and Computer Design, **Pearson publications**, 2016

Group I Practical 1	BSCCSP 132	36 Hours
Theory/Week: 3 Hrs Credit: 1	Digital Logic and MS Office Lab	IA: 10 Exam: 40

I. Experiments on Digital Logic

Part A

(Circuit diagram and truth table: 3, Rig up the circuit: 3 Output: 02)

1. Prove that NAND and NOR are Universal gates (by constructing NOT, AND and OR gates from them).
2. Realize the DeMorgan's theorems.
3. Construct a half-adder and half-subtractor and verify their truth table.
4. Construct a full-adder and verify its truth table.
5. Realize a 2-to-1 line multiplexer using NAND gates and verify the action.
6. Realize a magnitude comparator with 2 input lines and verify its action.

Part B

(Circuit diagram and truth table: 4, Rig up the circuit: 4 Output: 02)


1. Construct clocked RS flip-flop (using the IC 7400).
2. Realize the action of D flip-flop (using the IC 7474).
3. Realize the action of JK flip-flop (using the IC 7476).
4. Design and construct a 2-bit asynchronous up/down counter using JK flip-flop.

Exercises in MS-Office Package (12 Marks)

MS WORD Exercises

1. Prepare a word document with various formatting features and a table with formulae (Content may be changed).

Word Document With Different Formatting Features



Characteristics of First-generation Computers

1. Based on vacuum tube technology.
2. Computation time was milliseconds.
 - Very large and required a lot of space.
 - Since thousands of vacuum tubes were used, they generated a large amount of heat. Therefore, air conditioning was essential.


Limitations of a Computer

A computer can only perform what it is programmed to do. The computer needs well-defined instructions to perform any operation. Hence, computers are unable to give any conclusion without going through intermediate steps.

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Computer once meant a person who did computations, but now the term almost universally refers to automated electronic machinery. The first section of this article focuses on modern digital electronic computers



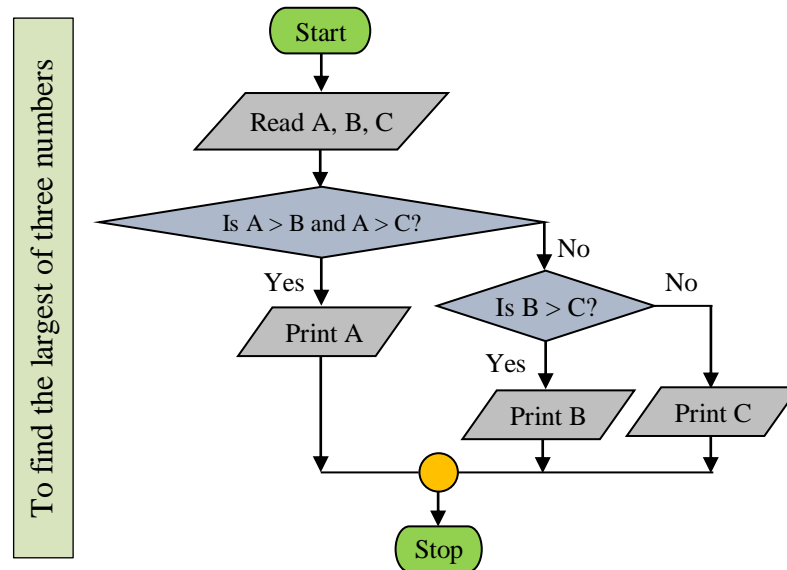
and their design, constituent parts, and applications. The second section covers the history of computing. For more details, log on to our web site or contact

$(A + B) = \bar{A} \cdot \bar{B}$
 $Volume = \pi r^2 h$
 $(1 + x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \dots$

Top Left	Top Centre	Top Right	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>PMCs</td><td>45</td></tr> <tr><td>PCM</td><td>60</td></tr> <tr><td>CBZ</td><td>65</td></tr> <tr><td>BCA</td><td>38</td></tr> <tr><td>Total</td><td>208</td></tr> <tr><td>Max</td><td>65</td></tr> </table>	PMCs	45	PCM	60	CBZ	65	BCA	38	Total	208	Max	65
PMCs	45														
PCM	60														
CBZ	65														
BCA	38														
Total	208														
Max	65														
Centre Left	Centre	Centre Right													
bottom Left	Bottom centre	bottom Right													

2. Using Mail Merge in MS Word, prepare interview call letters for five candidates, for teaching posts in two different subjects. Interview dates should be different for the two subjects. For each candidate interview time should be different.

3. Draw the following using various drawing tools:



MS Excel Exercises

1. Prepare a worksheet containing regno, name, marks in five subjects of five students. Calculate total, average (percentage) and class. To pass, a student has to get 35% in each subject. If he passes, he gets distinction if percentage ≥ 75 , First class if ≥ 60 and < 75 , second class if < 60 and ≥ 50 , third class otherwise. Using custom sort, sort the data according to class: distinction, first, second and so on. Within each class, average marks should be in descending order. Also draw the Column chart showing the regno versus average scored. Display title, legend, data labels and axes labels.
2. Prepare a work sheet to calculate electricity bill of several domestic customers. Input RR No, name of the customer, previous meter reading, current meter reading. The rates are as follows:
For the first 30 units - Rs. 2.5 per unit, for the next 70 units Rs. 3.5 per unit, for the next 100 units - Rs. 4.5 per unit, for the next 100 units - Rs. 6 per unit and for units above 300 - Rs. 8 per unit. A fixed amount of Rs. 150 is also charged. 5% tax has to be paid on the sum of bill amount and fixed amount. Use Data validation to see that current reading is more than previous reading. Arrange the records in the alphabetic order of names. Filter the records whose bill amount is more than Rs.1000.
3. Create an excel worksheet to prepare pay bill of several employees, with the following conditions:
If basic ≤ 5000 , DA is 15% of basic, if basic > 5000 and is ≤ 6000 , the DA is 10% of basic, otherwise DA is 6% of basic. If basic < 8000 , HRA is 1000, otherwise it is 1500. CCA is Rs. 250, PF is 5% of basic+DA. If basic > 8000 , deduct Rs.1000 towards IT. Deduct Rs. 200 towards profession tax, if gross salary is ≥ 10000 , 100 otherwise. Calculate gross and net salaries and sort according to names. Prepare individual pay slips of (at least 3) employees in another work sheet.

(Note: Give proper title, column headings for each worksheet. Insert at least five records into a worksheet. The results should take care of all the conditions mentioned in respective problems. Format numeric values appropriately wherever necessary)

Scheme of Practical Examination

The practical examination shall be conducted for 40 marks. There shall be two components – writing the circuit diagram, truth table and rigging the circuit and result and Viva-voce components. 40 marks can be distributed as follows.

Each practical paper includes three Parts - PART A, PART B and PART C. One question shall be asked in each part.

Sl. No.	Details		Marks	Total
I	PART A Combinational Circuits	i. Writing the Circuit and truth table	3	8
		ii. Rigging the Circuit	3	
		iii. Output	2	
	PART B Sequential Circuits	i. Writing the Circuit and truth table	4	10
		ii. Rigging the Circuit	4	
		iii. Output	2	
	PART C MS word or MS Excel	i. Creation of Document or Spreadsheet	8	12
		ii. Formatting or Formula Editing	4	
		Record		5
II	Viva –Voce		5	
Total Marks				40