

B.Sc. Final (Sem-V & VI)
Exam. 2015-16

Prospectus No. 2016123

संत गाडगेबाबा अमरावती विद्यापीठ
SANT GADGE BABA AMRAVATI UNIVERSITY

विज्ञान विद्याशाखा
(FACULTY OF SCIENCE)

अभ्यासक्रमिका
विज्ञान स्नातक अंत्य परीक्षा
सत्र-५-हिवाळी-२०१५
सत्र-६-उन्हाळी-२०१६

PROSPECTUS
OF

The Examination for the Bachelor of Science
Semester-V, Winter-2015, and
Semester-VI, Summer-2016
& Onwards



2015

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Books Recommended :

1. Programming in JAVA : By S.S.Khandare (S.Chand)
2. Teach Yourself -Javaøin 2 Hrs : By Sams.
3. Java for You : By P. Koparkar
4. OOP with C++ by E.Balguruswamy.
5. Mastering HTML 4.0 - D.S.Ray, E.J.Ray, BPB.
6. Active Server Pages 3.0, N.Chare (Que)

Practical : Minimum 8 practical based on above syllabus.

Project : The student have to carry out a mini project work, with group of maximum 03 students at department and project report should be prepared of the same.

B.Sc. Final Year, Semester-V
15. ELECTRONICS

General Provisions/Instructions**Part A**

- (i) The Examination in Electronics of each semester shall comprise of one theory paper of 80 marks of three hours duration and internal assessment of 20 marks.
- (ii) Theory paper of each semester shall comprise of six units. Each unit shall be completed in maximum 15 teaching periods of 48 minutes duration.
- (iii) There shall six questions of twelve marks on each unit with alternate choice and One compulsory question (08 subquestions of 01 mark each) of 08 marks covering syllabi of all units (short answer type).

Part B

- (i) The Practical examination of each semester of the B. Sc. (Electronics subject) shall be of 50 marks of 4 hours duration and shall be held at the end of each semester at the places as decided by the university.
 - (ii) Distribution of 50 marks assigned to practical for (Semester I to V) is as under-

1. Experiment	: 30 Marks
(Construction, testing and performance)	
2. Practical record	: 10 Marks
3. Viva-voce	: 10 Marks
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- Total : 50 Marks**
- (iii) Distribution of 50 marks assigned to practical for semester VI is as under-

1. Programming (Writing and execution) : 10 Marks
2. Project (Experimental) : 10 Marks
3. Project Report and Seminar : 10 Marks
4. Record : 10 Marks
5. Viva-voce : 10 Marks

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Total : 50 Marks

- (iv) Project will be given to a group of not more than four students.
- (v) Teacher may adopt any innovative practice for demonstration of practicals on the aspects given.
- (vi) College/ Department may prepare laboratory manuals of experiments

Semester-V
5S-Electronics
Measuring Instruments

Unit I : Basic Instrumentation:

Block diagram of generalized instrumentation system, Concept of transducers (Primary and secondary, active and passive, analog and digital). Resistive transducer - potentiometer, Inductive transducer - LVDT, capacitive transducer (by changing distance), measurement of displacement using capacitive transducer (By changing dielectric).

UNIT II: Measurement of Temperature:

Thermocouple, Thermopile, Thermister, RTD, Total Radiation Pyrometer, IC DS 1621 ,IC LM34 , IC LM35 , Infrared Pyrometer,

UNIT III: Timer and PLL:

IC 555 timer: Block diagram and function of each block, application of 555 timer as astable, bistable and monostable multivibrator (construction, working and expression for time period).

PLL Block diagram and function of each block, concept of capture range, pull in time, lock in range, electrical

characteristics, applications of PLL as FM demodulator, AM detector and frequency synthesizer.

UNIT IV: Display, digital Instrument and recorder:

Seven segment, 14 segment, dot matrix, 16x2 LCD display, advantage and disadvantage, Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block) .

Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.

Unit V : Sensors and Actuators:

Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal, Optical, magnetic, chemical)

Actuators: Definition, Working principles of Electromechanical, Electro thermal, Electro-optical and Electrochemical Actuators.

UNIT VI: Biomedical electronics:

Introduction, Type of electrode, EEG, EMG, ECG-block diagram and function of each block, X ray machine, instantaneous heart rate meter-systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse Doppler blood flow meter, Laser Doppler blood flow meter.

Books Recommended:

1. Electrical and electronics measurement and Instrumentation by A.K. Sawhney
2. Linear integrated Circuits by Ramakant Gaikwad
3. Biomedical instrumentation by R.S.Khandpur

Practicals: Minimum Ten experiments at least one on each of the following aspects.

1. LVDT, displacement measurement using C transducer, pot meter.
2. Temp measurement using thermister, RTD, LM34, LM35.
3. Astable, monostable, bistable using IC555.
4. FM demodulator, AM detector using PLL.

5. 16 x 2 LCD display, seven segment display and other display devices.
6. Sensors and actuators and its applications.
7. ECG, EMG, EEG, heart rate meter, oximeter etc.

Semester VI 6S-Electronics Advance Microprocessor and Microcontroller

UNIT I : 8086 Architecture:

Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.

UNIT II: Instructions and programming of 8086

Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle, Programming: programs of data transfer, addition, subtraction, division, multiplication using various addressing mode.

Unit-III : 8051 Microcontroller Architecture :

Microcontroller Introduction, Difference between Microprocessor and Microcontroller, block diagram of microcontroller, CPU, registers, flags, PSW, PC, Data Pointer, SFR, SP, Internal RAM/ROM, External memory, I/O ports, counter & timers, interrupts.

Unit-IV: Instruction set of 8051 and Programming:

Addressing mode, Instruction set: Data transfer, arithmetic, logical operation, JUMP, Loop and CALL instructions. Assembly language programming examples: simple data transfer, arithmetic, logical and single bit.

Unit-V : 8051 Interfacing & Application

Basics of serial communication, interfacing with RS-232C, SCON and PCON registers, interfacing a DAC / ADC and

waveform generation, interfacing to the 8255, interfacing LED, power reduction mode.

Unit-VI : Advance microcontroller:

Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/Counters.

Books Recommended:

- 1) Microprocessor Architecture and application by Dougulus Hall.
- 2) Intel Microproceesor 8086 by Brey: PHI
- 3) The 8051 Microcontroller architecture, Programming & Applications- Kenneth J.Ayala (Penram international)
- 4) The 8051 Microcontroller and Embedded Systems.- M. A. Mazadi, J. C. Mazadi (Pearson Education, Asia)
- 5) Microprocessor, microcontroller & applications- U. S. Shah (Tech-Max Publication Pune).
- 6) Programming and Customizing the 8051 Microcontroller- Mike Predko (TMH, New Delhi).

Practicals: Minimum Ten programmes at least five on each of the following aspects.

1. Programming on 8086(using kit/PC)
2. Programming on 8051 and/or C language.

AND

Minor project based on μ P 8085, 8086, μ C 8051, AVR, ARM, Communication, sensors, power amplifier, code converters, Bio-medical Electronics, Digital Electronics or any advance topic of Electronics (Construction and Report).

16 : BIOCHEMISTRY Semester - V

The examination in Biochemistry will comprise of one theory paper and one practical. Theory paper shall be of three hours duration and shall carry 80 marks each. The internal assessment will carry 20 marks. The practical examination shall be of six to eight hours duration for one day and shall carry 50 marks.

The following syllabus is prescribed on the basis of 6 lectures per paper per week and six practical periods per batch per week. Each theory paper has been divided into 6 units. There shall be one question on every unit with internal choice for each of 12 marks, one compulsory objective type question on whole syllabus of Semester-V carrying 8 marks.

Distribution of marks in practical shall be as follows:

- | | |
|------------------------------------|----------------------|
| 1) Two short experiments | - 20 marks (10 each) |
| 2) One long experiment | - 15 marks |
| 3) Viva-voce | - 08 marks |
| 4) Class work and practical record | - 07 marks |

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Total - 50 marks

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5S BIOCHEMISTRY MOLECULAR BIOLOGY AND BIOTECHNOLOGY

UNIT-I : A) Basic Concepts of Genetic Information

- a. Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey-Chase Experiment,
- b. Central dogma of molecular genetics - current version, reverse transcription and retroviruses.
- c. Salient features of eukaryotic, prokaryotic and viral genomes; highly repetitive, moderately repetitive and unique DNA sequences.
- d. Basic concepts about the secondary structures of nucleic acids, 5' $\hat{>}$ 3' direction antiparallel strands, base composition, base equivalence, base pairing and base stacking in DNA molecule. Tm and buoyant density and their relationship with G-C content in DNA.
- e. Waston and Crick model, A, B and Z types of DNA, major and minor grooves, chirality of DNA.
- f. Structures and properties of RNA: Classes of RNA.