

**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**  
**AURANGABAD**  
Faculty of Science  
**B.Sc. First Year Biotechnology (Integrated)**  
**ORGANIC CHEMISTRY**  
Paper I (Practical)

Time : 06 hours.

Marks: 100

- Q 1. a) Systematic qualitative analysis of organic compounds through, solubility element analysis, group detection and physical constant of organic compounds. (25)  
Or  
b) Determination of viscosity.
- Q 2. a) Determination of surface tension. (25)  
Or  
b) Purification of organic compounds by crystallization.
- Q 3. a) Purification of organic compounds by sublimation. (25)  
Or  
b) Purification of organic compounds by distillation.
- Q 4. Viva. (15)
- Q 5. Record book (10)

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**BIOCHEMISTRY**  
Paper II (Practical)

Time : 06 hours.

Marks: 100

- Q 1. Identification of given carbohydrate by qualitative tests. 25  
( **Hexose / Pentose / Disaccharide** )
- a) Principle. (15)
  - b) Observation. (05)
  - c) Result. (05)
- Q 2. a) Quantitative estimation of **Amino Acid**. 15  
Or  
b) Quantitative estimation of **Carbohydrate**.
- Q 3. a) Quantitative estimation of **DNA/RNA/Protein**. 15
- Q 4. Spotting. 20  
Spots of experiments that are not mentioned in above questions  
and from the syllabus should be included. (4x5mks)
- Q 5. Viva. 15
- Q 6. Record book. 10

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**PHYSICAL CHEMISTRY**  
Paper III (Practical)

Time : 06 hours.

Marks: 100

Q 1. a) To determine the specific reaction rate of hydrolysis of methyl acetate/  
ethyl acetate catalyze by hydrogen ion at room temperature. (25)

Or

b) To study the effect of acid strength on hydrolysis of an ester.

Q 2. a) To study kinetically the reaction rate of decomposition of iodide by  $H_2O_2$ . (25)

Or

b) To study the distribution of iodine between water and  $CCl_4$ .

Q 3. a) To determine the percentage composition of a given binary mixture by  
surface tension method. (25)

Or

b) To determine the percentage composition of a given mixture by  
viscosity method.

Or

a) To determine the enthalpy of solution of solid calcium chloride and  
calculate the lattice energy of calcium chloride from its enthalpy data  
using Born Harber cycle.

Q 4. Viva. (15)

Q 5. Record book. (10)

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**MICROBIOLOGY**  
Paper IV (Practical)

Time : 2 days 6 hours.

Marks: 100

- Q 1. Viable count / DMC. **(20)**
- a) Principle (10)
  - b) Technique (05)
  - c) Observation and result. (05)
- Q 2. Hanging drop technique / Effect of temperature or pH **(20)**
- Q 3. Staining. **(15)**
- a) Principle & procedure (05)
  - b) Technique. (05)
  - c) Result. (05)
- Q 4. Spotting. **(20)**  
Spots of experiments that are not mentioned in above questions  
and from the syllabus should be included. (4x5mks)
- Q 5. Viva. **(15)**
- Q 6. Record book. **(10)**

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**ANALYTICAL CHEMISTRY AND**  
**COMPUTER TECHNOLOGY**  
Paper V (Practical)

Time: 03 hours.

Marks: 100

- Q 1. Electrophoresis / Quantitative estimation of sugar by DNSA method / DNA estimation by spectrophotometer. (15)
- Q 2. Paper chromatography of amino acid / sugar / protein. (15)
- Q 3. Explain any five internal and external DOS commands (05)
- Q 4. Word commands / Excel commands / power point commands (10)
- Q 5. Problems on web browsers and E-mailing. (15)
- Q 6. Spotting. (20)  
I and II (analytical chemistry)  
III and IV (computer technology)
- Q 7. Viva (10)
- Q 8. Record book (10)

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**MATHEMATICS AND STATISTICS**  
Paper VI (Practical)

Time: 1 day 06 hours.

Marks: 100

- Q 1. a) Solving assignment problems by Hungarian method. (10)  
Or  
b) Solving assignment problems by Hungarian method.
- Q 2. a) Solving transportation problems by North West corner rule. (10)  
Or  
b) Solving transportation problems by Row minima method.
- Q 3. a) Solving transportation problems by Column minima method (10)  
Or  
b) Solving transportation problems by Matrix minima method  
Or  
c) Solving transportation problems by Vogel's method.
- Q 4. a) Solving sequencing problems by Johnson's method (10)  
Or  
b) Solving sequencing problems by Johnson's method.
- Q 5. a) Evaluating  $n$  where  $n$  is non negative integer. (05)  
Or  
b) Evaluating  $n$  where  $n$  is non negative integer.
- Q 6. a) Evaluation of (i)  ${}^n P_r$  (05)  
(ii)  ${}^n C_r$  (05)  
Or  
b) Evaluation of (i)  ${}^n P_r$   
(ii)  ${}^n C_r$
- Q 7. a) Construction of Pascal's triangle for  $n = 1, 2, 3, 4, 5, \dots$  (10)  
Or  
b) Construction of Pascal's triangle for  $n = 1, 2, 3, 4, 5, \dots$
- Q 8. Problems in statistics (20)
- Q 9. Viva. (05)
- Q 8. Record book. (10)

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Paper VII (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper VIII (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper IX (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper X (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper XI (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper XII (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper XIII- (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper XIV- (Practical)

Time: 2 days 6 hours.

Marks: 100

- Q 1. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 2. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 3. Spotting. **(25)**  
Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)
- Q 4. Viva. **(15)**
- Q 5. Record book. **(10)**

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Paper XV- (Practical)

Time: 2 days 6 hours.

Marks: 100

- Q 1. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 2. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 3. Spotting. **(25)**  
Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)
- Q 4. Viva. **(15)**
- Q 5. Record book. **(10)**

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Paper XVI- (Practical)

Time: 2 days 6 hours.

Marks: 100

- Q 1. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 2. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 3. Spotting. **(25)**  
Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)
- Q 4. Viva. **(15)**
- Q 5. Record book. **(10)**

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Paper XVII- (Practical)

Time: 2 days 6 hours.

Marks: 100

Q 1. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 2. As per syllabus **(25)**

- a) Principle (10)
- b) Technique (05)
- c) Procedure & Requirement (05)
- d) Observation and result. (05)

Q 3. Spotting. **(25)**

Spots of experiments that are not asked in above questions and from the syllabus should be included. (5x5mks)

Q 4. Viva. **(15)**

Q 5. Record book. **(10)**

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Paper XVIII- (Practical)

Time: 2 days 6 hours.

Marks: 100

- Q 1. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 2. As per syllabus **(25)**
- a) Principle (10)
  - b) Technique (05)
  - c) Procedure & Requirement (05)
  - d) Observation and result. (05)
- Q 3. Spotting. **(25)**  
Spots of experiments that are not asked in above questions  
and from the syllabus should be included. (5x5mks)
- Q 4. Viva. **(15)**
- Q 5. Record book. **(10)**