

[MS 731]

Sub. Code : 4222

FOURTH B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

Paper II — PHARMACEUTICAL BIOTECHNOLOGY

Time : Three hours

Maximum : 90 marks

Two and a half hours

Sections A & B : 60 marks

for Sections A and B

Section C : 30 marks

Answer Sections A and B in separate answer books.

Draw diagrams wherever necessary.

Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Discuss the general principles and procedure of sterility testing outlined in I.P. Add a note on modifications for antibiotics and paraffin gauze. (10 + 5)
2. Give the essential details for the manufacture of viral vaccines of your choice.
3. Write an account of Insulin and its products. Add a note on its production by genetic engineering. (10 + 5)

SECTION B — (6 × 5 = 30 marks)

4. Write briefly on any SIX :
 - (a) Pathogenic fungi.
 - (b) Enrichment and selective media.
 - (c) Bio safety techniques.
 - (d) Plasma substitutes.

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- (e) Sensitivity testing.
 - (f) R.W. Phenol coefficient.
 - (g) Streptomycin production.
 - (h) Standards for sutures and ligatures.
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for Sec. A and Sec. B

Sec. C : 30 marks

Answer Sections A and B in separate answer books.

Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. What are Surgical ligatures and sutures? List out the essential properties they should possess. Describe the preparation of catgut.
2. (a) Write the fermentative production of Lactic acid. Draw flow sheet diagram. (10)
(b) Write a brief note on monoclonal antibodies. (5)
3. Enumerate the official Blood Products. Discuss the preparation, storage and uses of dried human plasma.

SECTION B — (6 × 5 = 30 marks)

4. Write briefly on any SIX of the following :
 - (a) Preparation of killed bacterial vaccines. Name any two official vaccines.
 - (b) Methods of preservation of pure cultures.
 - (c) Various methods of sterilization.

(d) Phenol coefficient tests as a method of evaluation of a disinfectant.

(e) Various types of culture media.

(f) Principle of microbiological assay of vitamins.

(g) Normal growth cycle of bacteria.

(h) Asexual reproduction in Fungi.

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for Sec. A and Sec. B For Sec. C : 30 marks

Answer Section A and B in separate answer books.

Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Define gene cloning. List out the various steps to be followed in sequence to make a bacterial cell to synthesize an industrially important polypeptide molecule like Insulin. Discuss in detail on Restriction endonucleases and Plasmid cloning vectors. (2 + 3 + 5 + 5)

2. Define and classify Bacterial vaccines. Discuss the production and standardisation of Tetanus toxoid. (2 + 3 + 6 + 4)

3. Differentiate between the terms 'Sterilisation' and 'Disinfection'. List out various factors that influence the disinfectants' activity and discuss their role in influencing the same. (3 + 3 + 9)

SECTION B — (6 × 5 = 30 marks)

4. Write briefly on any SIX of the following :
- (a) Normal growth curve of bacteria.
 - (b) Micro and macro morphological features of any two industrially important molds.
 - (c) Different types of measurement of bacterial growth and detailed account of viable count method.
 - (d) Utility of U.V. light in sterilisation.
 - (e) Role of saturated steam in autoclaving and the reasons for prevention of formation of superheated steam in large sterilisers.
 - (f) Haemostatic agents.
 - (g) Microbiological assay of Penicillin.
 - (h) Catgut.

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for Section A and B Section C : 30 marks

Answer Sections A and B in separate answer books.

Answer Section C in the answer sheet provided.

SECTION A — ($2 \times 15 = 30$ marks)

Answer any TWO questions.

1. Write briefly on isolation and identification techniques of bacteria. (15)

2. Explain the preparation, packing and labelling of oral polio vaccine.

Live vaccines such as BCG and small pox require only one vaccination for effective immunity whereas live polio vaccine requires a minimum of three doses for effective immunity — Explain. (12 + 3)

3. What do you mean by Recombinant DNA technique?

Explain in detail on restriction endonucleases and plasmid cloning vectors.

Explain the steps involved in the production of monoclonal antibodies by using the techniques of genetic engineering. (15)

SECTION B — ($6 \times 5 = 30$ marks)

4. Write short notes on any SIX :

- (a) Surgical sutures.
- (b) Use of yeast in the production of biological products.
- (c) Safety techniques in microbiological works.
- (d) Injection of ACTH.
- (e) Sterilisation by autoclaving.
- (f) Production of insulin with the help of microorganisms.
- (g) Storage of official blood products.
- (h) Solid state fermentation.

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Two and a half hours Sec. A & B : 60 marks

for Sec. A & Sec. B Section C : 30 marks

Answer Sections A and B in separate answer books.

Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Define sterilization. Explain the different methods of sterilization with suitable examples. Explain the procedure for conducting test for sterility of an antibiotic preparation.
2. Explain in detail the fermentative production of citric acid with a flow sheet. Explain in detail the precautions to be taken in any fermentation process.
3. Explain in detail the general principles and method of carrying out microbiological assays for antibiotic.

SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

4. Write briefly on the following :
 - (a) Preparation of a bacterial vaccine.
 - (b) Method of sterilization of surgical ligature and sutures.
 - (c) A sexual reproduction of fungi.
 - (d) Storage of official blood products.
 - (e) Monoclonal antibodies.
 - (f) Evaluation of disinfectant.
 - (g) Enumerate the different types of media and their uses.
 - (h) Plasma substitutes.

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Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Draw diagrams wherever necessary.

Answer any TWO questions.

1. Discuss bacteria with respect to the following aspects Morphology, growth curve, methods of measurement of bacterial growth. (15)
2. (a) Write the fermentative production of penicillin. Draw flow sheet diagram.
(b) Write a brief note on monodonal antibodies. (12 + 3)
3. Define the terms : disinfectant, antiseptic, bactericide, bacteriostat and antibiotic.
Write any two methods for the evaluation of disinfectants. (5 + 10)

SECTION B — (6 × 5 = 30 marks)

4. Write briefly on any SIX :
 - (a) Viable count
 - (b) Synchronous culture
 - (c) Test for sterility (official procedure)
 - (d) Injection of insulin and its products
 - (e) Various types of culture media
 - (f) Plasma substitutes
 - (g) Microbiological assay of antibiotics.
 - (h) Schick test toxin and Schick control.

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Section C : 30 marks

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Answer Section C in the answer sheet provided.

SECTION A — ($2 \times 15 = 30$ marks)

Answer any TWO questions.

1. Discuss about Recombinant DNA technology. Discuss about production of human insulins by genetic engineering.
2. What are the factors influencing disinfectant action of disinfectants? How are disinfectants evaluated?
3. Discuss in detail the production evaluation and labelling for oral polio myelitis vaccines.

SECTION B — ($6 \times 5 = 30$ marks)

4. Write briefly on any SIX of the following :

- (a) Microbial transformation
- (b) Preparation of Surgical Catgut.
- (c) Preparation and storage of human plasma.
- (d) Preservation of Microbes.
- (e) Discuss about Microbial counting techniques.
- (f) Microbiological assay with specific examples.
- (g) Production of streptomycin by fermentation
- (h) Production of injection of penicillin.