Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 13

B.Pharma (2017 Batch) (Sem.–3)

PHARMACEUTICAL MICROBIOLOGY

Subject Code : BP-303T

M.Code : 75107

Time : 3 Hrs.

Max. Marks : 75

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains THREE questions carrying TEN marks each and student has to attempt any TWO questions.
3. SECTION-C contains NINE questions carrying FIVE marks each and student has to attempt any SEVEN questions.

SECTION-A

1. **Answer briefly :**

   a) Differential media

   b) Acid fast staining

   c) Antiseptics

   d) Z value

   e) Primary cell culture

   f) Microbial spoilage

   g) Microbiological assay

   h) Preservative capacity

   i) CFU

   j) Log phase

SECTION-B

2. Discuss in detail the sterilization procedures employed for thermolabile materials.
3. Write notes on :

   a) Evaluation of disinfectants

   b) Electron microscopy

4. Describe the following :

   a) Evaluation of microbial stability of formulations

   b) Growth of Anchorage dependent cells

SECTION-C

5. Write a note on various sources of contamination.
6. Highlight the applications of cell culture in pharmaceutical industry.
7. Describe the method used for sterility testing of ophthalmic products.
8. What are the different types of media used for growth of bacteria?
9. Write a note on preservation methods of pure cultures.
10. Describe the replication of viruses.
11. How will you carry out IMViC test?
12. Highlight the importance of study of microbiology in pharmacy.
13. Write a note on types of microbial spoilage.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

14 DEC 2020

Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 22

B.Pharma (2017 & Onward) (Sem.–3)

PHARMACEUTICAL MICROBIOLOGY

Subject Code : BP-303T

M.Code : 75107

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SECTION-A

Define briefly :

1. Prokaryotes
2. Oxidase test
3. Viable cell count
4. Pharmaceutical microbiology
5. Horizontal laminar air flow unit
6. Classification of bacteria
7. Aseptic area
8. EMEM media
9. Microbiological assay
10. Gases used for sterilization

SECTION-B

11. Write notes on :
    a) Importance of preservation of pure cultures
    b) Gram staining
12. Describe in detail the methods employed for evaluation of disinfectants.
13. How will you carry out microbiological assay as per IP?

SECTION-C

14. Classify bacteria on the basis of their nutritional requirements.
15. Describe filtration as a method of sterilization.
16. Write a note on sterility indicators.
17. Write a note on various sources of contamination.
18. What is Microbial Spoilage? Discuss the various factors affecting spoilage.
19. Write a note on transformed cell lines.
20. Write a note on construction and classification of clean room area.
21. Describe the principle and working of phase contrast microscopy.
22. Write a note on IMViC.

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22 JAN 2021

Roll No. | | | | | | | | | | | Total No. of Pages : 02

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SECTION-A

Define briefly :

1. Slants
2. Sterilization
3. Zone of inhibition
4. Toxoid
5. Plague

Differentiate between

6. Vitamins and antibiotics
7. Prokaryotes and Eukaryotes

How following materials tested for sterility:

8. 0.9% w/v, 500ml Sodium Chloride injection and WFI
9. How test tubes, culture media, cotton and conical flask sterilized.
10. How autoclaving of petriplates differ from test tubes containing cultural media.

SECTION-B

11. What is sterilization? Enumerate methods for sterilization.
12. What is sterility testing? How sterility testing is conducted as per IP.
13. Write short note on :
    a. Bacterial enzymes
    b. Gene expression

SECTION-C

14. Give principle and procedure for staining techniques.
15. Give different methods for the evaluation of disinfectants and explain any two.
16. What is electron microscopy? Give its applications.
17. What is microbial assay? Give method for the assay of vitamins.
18. Explain the different Diagnostic preparations.
19. Explain the Structure of Bacterial cell.
20. What are the factors effecting microbial spoilage in pharmaceutical products?
21. What is cell culture? Give general procedure for the growth of cell cultures.
22. Classify microbes with examples.

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30/12/2021 M

Roll Number ---------- (Total Number of Questions 13) (Total number of Printed Pages 01)

Programme	B. Pharmacy
Semester	3rd
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Subject Code	BP303T
Paper ID	75107
Time	3Hours
Maximum Marks	75

Instructions to Candidates:*No supplementary/continuation sheet will be issued to the candidates. Answer the questions precisely.*
Section A consists of Ten parts of 2 marks each (Objective Type); Attempt **ALL.*
***Section B consists of Three questions carrying 10 marks each (Long Answer); attempt any **TWO**.*
****Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section A **(10 X2 = 20)**

1. Give very short answers to the followings (2 marks each):

i.	Mention reagents used for acid fast staining.
ii.	What is Mycology?
iii.	Define Sterilization.
iv.	Differentiate between Disinfection and Antisepsis.
v.	What is Secondary Cell Culture?
vi.	Differentiate between Prokaryotes and Eukaryotes.
vii.	Write the principal of sterility testing.
viii.	What is Grade 100 of clean room?
ix.	What are cell lines?
x.	What is Z value?

Section B **(2 X 10 = 20)**

2.	Classify bacteria on the basis of nutritional requirements and add a note on raw material used for preparation of culture media.
3.	Write a note on cultivation of Virus. Discuss about merits and demerits of viral cultivation techniques.
4.	Define Cell Culture. Give procedure, merits, demerits and applications of Cell Culture.

Section C **(7 X 5 = 35)**

5.	Explain the different sources and types of microbial contamination in pharmaceuticals.
6.	Describe Bacterial growth curve in detail.
7.	Explain the source, mechanism of action and applications of sterilization using radiations.
8.	Explain different methods for evaluation of bacteriostatic disinfectant.
9.	Give detailed explanation of Phase contrast microscopy.
10.	What is Microbial spoilage? Discuss the various factors affecting spoilage.
11.	How will you carry out IMViC test?
12.	Write a note on Gram staining.
13.	Explain Phenol coefficient test.

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07/7/22 M

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Semester	3rd
Subject	Pharmaceutical Microbiology
Subject Code	BP303T
Paper ID	75107
Time	3Hours
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Section A (10 X2 = 20)

1. Give very short answers to the followings (2 marks each):

i.	Define the term a) Negative staining. b) Z- Value.
ii.	What is the ideal temperature and pH for the growth of bacteria?
iii.	What is MPN?
iv.	Draw a well labeled diagram of Bacterial cell.
v.	"Some moisture is necessary but little is better than a lot". Justify the statement in respect of gaseous sterilization.
vi.	Define Primary cell culture.
vii.	Name two Bacteriostatic agents.
viii.	What is the difference between Antiseptic and Disinfectant?
ix.	What do you mean by class 100 clean room?
x.	How the following material is tested for sterility? a) 500 ml Dextrose Injection b) Thermo labile drugs

Section B (2 X 10 = 20)

2.	a) Differentiate between Gram +ve and Gram –ve bacteria. b) Differentiate between Chick martin and Rideal Walker test.
3.	What is sterility testing? How sterility testing of ophthalmic products performed as per IP?
4.	Enumerate the nutritional requirement for the growth of bacteria. Explain its Growth Curve.

Section C (7 X 5 = 35)

5.	Discuss the requirement for the cultivation of Fungi.
6.	Give the principle and procedure of gram staining.
7.	What is electron microscope? Give its application.
8.	Discuss the applications of animal cell culture in pharmaceutical industry and research.
9.	What are pure culture techniques? Explain any two pure culture techniques.
10.	Discuss in detail the microbiological assay of vitamins.
11.	Write a note on Laminar air flow.
12.	Write a note on evaluation methods of disinfectants.
13.	Define culture media. What is the role of peptone, NaCl, agar in the medium?

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Programme	B. Pharmacy
Semester	3rd
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Subject Code	BP303T
Paper ID	75107
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****Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A **(10X2=20)**

1	Give very short answers to the followings:
i.	Write contributions of Louise Pasteur.
ii.	Differentiate between flagella and fimbriae.
iii.	Define disinfection.
iv.	What is primary cell culture?
v.	Write the principle of membrane filtration method of sterility testing.
vi.	Classify bacteria based on their temperature requirement with example.
vii.	Write short note on fungi.
viii.	Application of animal cell culture.
ix.	What is lag phase of bacterial growth?
x.	Classify physical method of sterilization.

Section- B **(2X10=20)**

2.	Explain the principle, procedure and application of sterilization using hot air oven.
3.	Explain different methods of evaluations of disinfectants.
4.	Define and classify culture media. Mention silent feature of each media along with an example.

Section- C **(7X5= 35)**

5.	Explain the principle involved in autoclaving.
6.	What are the main sources of contamination of an aseptic room? How will you prevent it?
7.	Write principle and procedure of Gram's staining.
8.	Outline working principle of TEM and SEM.
9.	Differentiate between gram-positive and gram-negative bacteria.
10.	Explain MR-VP tests used for identification of bacteria.
11.	Explain the different sources and types of microbial contamination of pharmaceuticals.
12.	Classify disinfectants. Write the mechanism of action and uses of phenolic disinfectants.
13.	Explain Principal involved in microbiological assay of Vitamin B_{12}.

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Roll Number ---19 Jun 2023--- (Total Number of Questions 13) (Total number of Printed Pages 01)

Programme	B. Pharmacy
Semester	3rd
Subject	Pharmaceutical Microbiology
Subject Code	BP303T
Paper ID	75107
Time	3Hours
Maximum Marks	75

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**** Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A **(10 X2 = 20)**

1.	Give very short answers to the followings-
i.	Classify Viruses.
ii.	Write the biochemical identification tests of Bacteria.
iii.	Discuss the merits and demerits of physical and chemical sterilization.
iv.	Write brief about sterility indicators.
v.	Discuss the principles of different microbiological assays.
vi.	How new antibiotics will be assessed?
vii.	Write about types of spoilage in pharmaceutical products.
viii.	Write in brief the evaluation of Bactericidal.
ix.	Write about quantitative measurement of bacterial growth.
x.	Give the principle of radiation method of sterilization.

Section- B **(2 X 10 = 20)**

2.	Brief the classification and mode of action of disinfectants.
3.	Discuss the methods of standardization of antibiotics, vitamins and amino acids.
4.	Describe the evaluation of microbial stability of formulations.

Section- C **(7 X 5 = 35)**

5.	Describe the general methods of cell culture.
6.	Discuss the replication and cultivation of fungi.
7.	Write the equipments used in large scale sterilization.
8.	Discuss in brief the staining techniques of identification of bacteria.
9.	Discuss in brief about electron microscopy.
10.	Differentiate between in brief about Eukaryotes and Prokaryotes.
11.	Describe the evaluation process for the efficiency of sterilization methods.
12.	What the nutritional requirements of raw materials used in preparation of culture media?
13.	Discuss the history and scope of microbiology.

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05 12 23
(Morning)

Roll Number ---------- (Total Number of Questions 13) (Total number of Printed Pages 01)

Programme	B. Pharmacy
Semester	3rd
Subject	Pharmaceutical Microbiology
Subject Code	BP303T
Paper ID	75107
Time	3Hours
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**** Section C consists of nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section A (10 X2 = 20)

1.	Give very short answers to the following:
i.	Define Primary cell culture.
ii.	What is the D value? Write its significance.
iii.	Write the principle of phase contrast microscope.
iv.	What is IMViC?
v.	Differentiate between prokaryotes and eukaryotes.
vi.	Define the term sterility indicators.
vii.	Give examples of bacteriostatic and bactericidal agents.
viii.	Give specification of class 100 clean room?
ix.	DOP test is used for validation of _____.
x.	Define MPN.

Section B (2 X 10 = 20)

2.	Discuss the applications of animal cell culture in the pharmaceutical industry and research.
3.	Enumerate the nutritional requirements for the growth of bacteria. Explain its Growth Curve.
4.	Discuss the principle and procedure for the identification of bacteria using the IMViC test.

Section C (7 X 5 = 35)

5.	Classify Fungi with examples.
6.	Write a note on microbiological assay of Riboflavin and Pyridoxine.
7.	How can you perform sterility testing of ophthalmic preparations?
8.	What is sterilization? Explain the physical methods of sterilization in detail.
9.	Define disinfectants. Explain the evaluation of antimicrobial agents and disinfectants.
10.	Give the morphological classification of bacteria.
11.	What are pure culture techniques? Explain any two pure culture techniques.
12.	Describe different types of microbial contamination of pharmaceutical preparation.
13.	Write a note on an electron microscope? Give its application.

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31 05 24

Roll Number ---------- (Total Number of Questions 13) (Total number of Printed Pages 01)

(Evening)

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Semester	3rd
Subject	Pharmaceutical Microbiology
Subject Code	BP303T
Paper ID	75107
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Maximum Marks	75

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**** Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A **(10 X2 = 20)**

1.	Give a very short answers to the followings:
i.	Write the classification of fungi.
ii.	What is the morphological outline of bacteria?
iii.	What are staining techniques?
iv.	Write the principle of gaseous sterilization.
v.	Write the evaluation of bacteriostatic.
vi.	Write in brief sterility testing of solid pharmaceutical products according to the British pharmacopoeia?
vii.	Give the working principle of different microbiological assay.
viii.	Write in brief different types of phase contrast microscopy.
ix.	Elaborate in brief the evaluation of antiseptics for bacteriostatic and bactericidal actions.
x.	Write in brief about primary established and transformed cell cultures.

Section- B **(2 X 10 = 20)**

2.	Explain in detail the different sources of contamination in aseptic area and their methods of prevention.
3.	Name the sources, types and assessment of microbial contaminations.
4.	Describe the classification and mode of action of disinfectants.

Section- C **(7 X 5 = 35)**

5.	Write the methods of standardization of vitamins.
6.	Discuss the preservation of pharmaceutical products using antimicrobial agents.
7.	State the general procedure for cell culture.
8.	List out the various applications of cell culture in pharmaceutical industry and research.
9.	Describe the designing of aseptic area.
10.	Discuss the sterility testing of ophthalmic and other sterile products according to IP
11.	Illustrate the design and working of laminar air flow equipments.
12.	Enumerate the factors influencing disinfection.
13.	Explain the merits, demerits & application of mechanical methods of sterilization.

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(Evening)

221124

Roll Number ---------- (Total Number of Questions 13) (Total number of Printed Pages 01)

Programme	B. Pharmacy
Semester	3rd
Subject	Pharmaceutical Microbiology
Subject Code	BP303T
Paper ID	75107
Time	3Hours
Maximum Marks	75

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**** Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A **(10X2=20)**

1.	Give very short answers to the followings:
i.	Enlist different types of microscopy.
ii.	What is microbial spoilage?
iii.	What is capsid?
iv.	Write the difference between prokaryotic and eukaryotic cell.
v.	Define cell culture.
vi.	What are amino acids?
vii.	Write about contribution of Louis Pasteur in field of microbiology.
viii.	Enumerate sources of contamination in aseptic area.
ix.	Differentiate in between bacteriostatic and bactericidal agents.
x.	Give difference between mordant and decolorizing agent.

Section- B **(2X10=20)**

2.	Give morphological classification of bacteria with suitable examples and diagrams.
3.	Write the mechanism, procedure and advantages of gram staining technique.
4.	Explain methods to evaluate bacteriostatic activity of disinfectant.

Section- C **(7X5=35)**

5.	Describe bacterial growth curve with all phases.
6.	Discuss methods to prevent contamination in aseptic area.
7.	Explain methods for standardization of antibiotics.
8.	What are the factors influencing disinfectant?
9.	Discuss factors affecting microbial spoilage of pharmaceutical products.
10.	Describe different types of sterility indicators for evaluation of sterilization.
11.	Write a note on cultivation of virus.
12.	Explain IMViC Test for identification of bacteria.
13.	Give difference between gram positive and gram negative bacteria.

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13 12 24 (Evening)

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Semester	3rd LEET
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****Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A **(10X2=20)**

1.	Give very short answers to the followings:
i.	Define the morphological classification of bacteria
ii.	What are sterility indicators?
iii.	Write the mode of action of disinfectants.
iv.	Draw a flow diagram of aseptic area.
v.	Give the difference between bactericidal and bacteriostatic.
vi.	What is microbial spoilage?
vii.	How will you define cell culture?
viii.	Enlist name of any four gram positive bacteria.
ix.	Define microbial contamination.
x.	What are the types of spoilage?

Section- B **(2X10=20)**

2.	What are the different methods for standardization of antibiotics and vitamins?
3.	Explain various methods of sterilization.
4.	Describe the classification, replication and cultivation of virus.

Section- C **(7X5=35)**

5.	Give the principle, working and application of moist heat sterilizer.
6.	Discuss the classification and reproduction of fungi.
7.	Explain the factors affecting microbial spoilage of pharmaceutical products.
8.	How to prevent pharmaceutical products with the help of antimicrobial agent?
9.	Explain ultra structure and morphological classification of bacteria.
10.	Describe the concept and design of clean and aseptic area.
11.	Write in detail about phase contract microscopy.
12.	Write in detail about various stages sterility testing of liquid products.
13.	Explain various preservation methods for pure cultures.

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(Morning)
17 06 23

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Section- B** consists of* ***three questions*, each carrying* ***10 marks*** *(Long Answer Type);* ***Attempt any two.***
****Section- C** consists of* ***nine questions****, each carrying* ***5 marks*** *(Short Answer Type);* ***Attempt any seven.***

Section- A **(10X2=20)**

1.	Give very short answers to the followings:
i.	What is acid-fast staining?
ii.	Differentiate between bactericidal and bacteriostatic.
iii.	What is the Rideal-Walker test?
iv.	What is the IMViC test?
v.	Write any two examples of antimicrobial agents.
vi.	What is meant by a Class 10 room in microbiology?
vii.	Define an aseptic area.
viii.	What is cell culture?
ix.	What is phase contrast microscopy?
x.	How can we perform quantitative measurement of bacterial growth?

Section- B **(2X10=20)**

2.	Elaborate the principle, procedure, merits, demerits, and applications of the heat sterilization method in detail.
3.	What are microbiological assays? Describe in detail the methods used for the microbiological assay of antibiotics.
4.	Describe in detail the method for performing sterility testing of ophthalmic products as per IP.

Section- C **(7X5=35)**

5.	Write the procedure and advantages of the Gram staining technique.
6.	Differentiate between prokaryotes and eukaryotes with examples.
7.	Write the methods for evaluation of the efficiency of sterilization.
8.	Write the morphological classification of bacteria.
9.	Give the classification of disinfectants with suitable examples.
10.	Write a note on laminar air flow and its applications.
11.	Elaborate the sources and types of microbial contaminants.
12.	Write different sources of contamination in an aseptic area with examples.
13.	Elaborate the applications of cell cultures in the pharmaceutical industry and research.

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(Morning)
12 12 25

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****Section C consists of Nine questions carrying 5 marks each (Short Answer); attempt any **SEVEN**.*

Section- A (10X2=20)

1.	Give very short answers to the followings?
i.	Difference between prokaryotes and eukaryotes?
ii.	What do you understand by IMViC?
iii.	Explain the bacterial growth curve?
iv.	Write any four names of equipments for sterilization?
v.	Discuss the application of cell culture in pharmaceutical industry?
vi.	Write about clean area classification?
vii.	What are the different sterility tests?
viii.	Write about transformed cell culture?
ix.	Define aseptic area?
x.	Define sterility indicators with examples?

Section- B (2X10=20)

2.	What do you mean by sterilization? Discuss about principle, procedure, merits, demerits and applications of physical method of sterilization?
3.	Give the classification of disinfectants and write a note on evaluation of disinfectant?
4.	Discuss various types of animal cell cultures and write the procedure for isolation of cells for in-vitro culture?

Section- C (7X5=35)

5.	Explain the source and type of microbial contamination?
6.	Discuss the classification and reproduction of viruses?
7.	What are the principles and methods of different vitamins assay?
8.	What are the nutritional requirements, raw materials used for culture media?
9.	Define electron microscopy?
10.	Explain viable count method of bacteria?
11.	Write a note on laminar air flow?
12.	Write in detail about various stages sterility testing of ophthalmic products?
13.	Write short note on- assessment of new antibiotic?

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