



ANJUMAN-I-ISLAM'S

**AKTC KALSEKAR TECHNICAL CAMPUS**

INNOVATIVE TEACHING · EXUBERANT LEARNING

**Knowledge Resource & Relay Centre (KRRC)**

School of Architecture

School of Engineering & Technology

School of Pharmacy

AIKTC/KRRC/SoP/ACKN/QUES/2013-14/73

Date: 13/06/2014

School: SoP-CBSGS Branch: \_\_\_\_\_

SEM: IV  
2013-14

To,  
Exam Controller,  
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following Semester/Periodic question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Organic Chem.-II			✓	02
2	Pharm. Analysis-I			✓	02
3	Pharmaceutics-II			✓	02
4	Microbiology			✓	02
5	Pharmacology-I			✓	02
6	Math. & Statistics			✓	02

Note: SC – Softcopy, HC - Hardcopy

*Ansari*

(Shaheen Ansari)  
Librarian, AIKTC

Q.1: i. Give Meanings-

(03)

- Buffer capacity
- Chelating agent
- Common ion effect

ii. Give two differences and examples for each of the following-

(04)

- Primary standard and secondary standard
- Oxidising agents and reducing agents

iii.- Explain in brief-

(04)

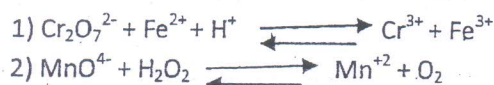
- Faradays first law of electrolysis.
- Polarisation and decomposition potential

iv. a) A partition coefficient of a solute between water and ether is 3.9. If 20ml of an aqueous solution of the compound is extracted with 25ml of ether, what percentage of the original solute will be found in ether layer and in aqueous layer after equilibrium?

(02)

b) Complete and Write the net balanced reactions:

(02)



Q.2: A) Explain types of non-aqueous solvents with suitable examples.

(03)

B) Give principle, reactions, indicator used in following determination -

(04)

- Assay of KCl
- Standardisation of Silver Nitrate

C) Write short notes on-

(04)

I. KFR

II. Biamperometric Titrations

Q.3: A) Discuss differences between Iodimetry and Iodometry.

(03)

B) Give therapeutic category, uses and assay of -

(04)

i. Aspirin

ii. Calcium gluconate injection

C) Explain principle, construction and working of DME.

(04)



Q. 4: A) Explain in brief cermometry and permagnometry? (03)

B) What are pH indicators. Explain any one theory of neutralisation indicators. (04)

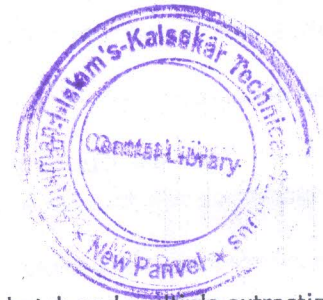
C) Discuss unit operations in gravimetry in detail. (04)

Q. 5: A) Define Accuracy. Calculate median and Coefficient of variation for following data. (03)

Replicate Burette readings obtained in standardisation of 0.05 M $\text{KMnO}_4$ solution (in mL)	20.5	20.7	20.3	18.9	20.9	19.5
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B) Write short notes on-(Any Two) (04)

- E. D. T. A. Back-titrations
- Masking and demasking agents
- Metalochromic indicators



C) Enlist factors affecting liquid-liquid extraction. Add a note on batch and multiple extractions. (04)

Q. 6: A) What is gravimetric factor? Calculate gravimetric factor for each of following: (03)

Sr. No.	Substance sought	Substance weighed
i.	Ba	$\text{BaSO}_4$
ii.	Fe	$\text{Fe}_2\text{O}_3$
Atomic weights: C:12, H:1, O:16, Ba: 137.33, S:32, Fe:55.84		

B) Solve- (04)

- Find out pH before and after the addition of 0.01 mole of NaOH to 1 litre of buffer solution which is 0.1M in  $\text{CH}_3\text{COOH}$  and 0.1M in  $\text{CH}_3\text{COONa}$ . ( $K_a$  for  $\text{CH}_3\text{COOH} = 1.75 \times 10^{-5}$ )
- A buffer solution consist of 0.20 mole of  $\text{NH}_4\text{OH}$  and 0.25 mole of  $\text{NH}_4\text{Cl}$  per litre. What is the pH of the solution ( $K_b$  for  $\text{NH}_4\text{OH} = 1.81 \times 10^{-5}$ ).

C) Answer the following. (04)

- Explain principle of oxygen flask combustion method

or

Write short note on- nitrite titrations

- A 25 mg of API containing nitrogen was Kjeldahlised with conc. sulphuric acid. Before the ammonia was steam distilled, 18ml of 0.020 M HCl was placed in the receiver. After distillation, 8.4ml of 0.020 M NaOH was required to back titrate the excess acid. Calculate the percentage of nitrogen present in the sample.

Sem IV (CBSE)

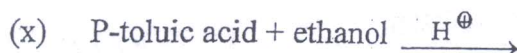
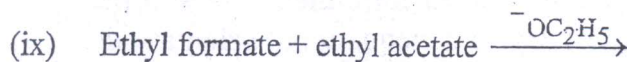
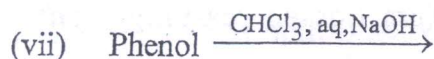
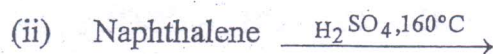
2018-14  
QP Code : BR-14665

05-5-14

(3 Hours)

[ Total Marks : 70

N.B. : (1) All questions are compulsory.

1. (a) Give the identification tests for the following : 3  
Acetone, ethanol and phenol.(b) Give reason for the following :- 2  
(i) Dimethylamine is more basic than methylamine.  
(ii) Dichloroacetic acid is more acidic than acetic acid.(c) Complete the following :- 102. (a) (i) Give the mechanism of Hoffman elimination reaction on N-propyltrimethylammonium hydroxide. 2(ii) What do you mean by Sandmeyer reaction. Explain with suitable example. 2(b) (i) Outline the syntheses of amides from various acid derivatives. 2(ii) Name the reactive intermediate formed in Birch reduction. Explain the reaction conditions of Birch reduction and give one example. 2

Con. 3979-14.

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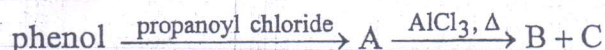




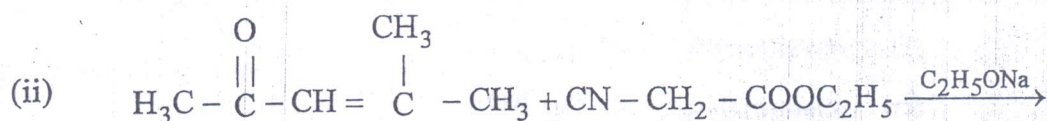
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2

- (c) Give the products A, B, & C of the following reaction and identify the name reaction involved.



3. (a) Give the products of the following and give mechanism for any one of the following :-



- (b) Give the synthesis of the following :-

- (i) Propanoic acid from malonic ester  
(ii) Naphthalene by Haworth method.

- (c) Explain the energetics for various conformers of n-butane. Draw various conformers of butane and comment on their stabilities.

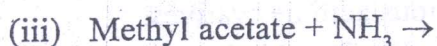
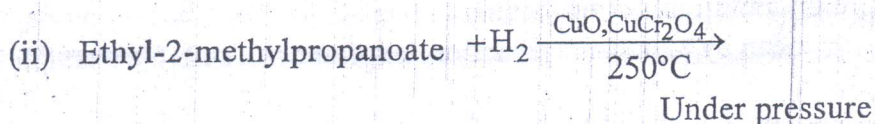
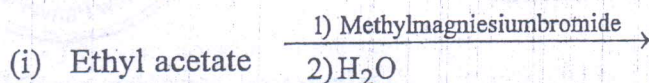
4. (a) (i) Name the intermediate resulting from Lossen rearrangement. Give the mechanism for its formation.

- (ii) Give the mechanism for Sommet alkylation.

- (b) Justify the following statements.

- (i) Cyclohexane prefers to remain in chair form than in boat form.  
(ii) Cis-cyclohexane -1, 3 - diol exhibits diequatorial orientations.

- (c) Give the products of the following reaction.



Con. 3979-14.

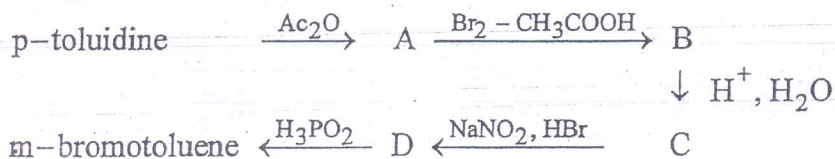
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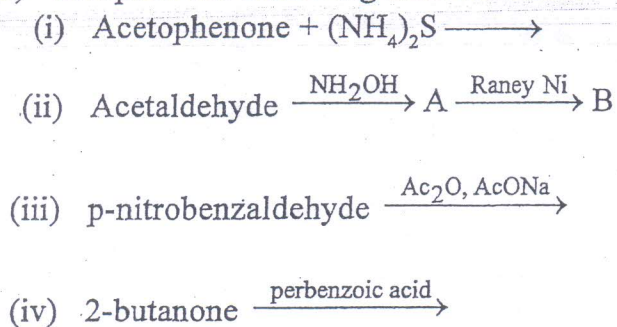
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3

5. (a) Give any three methods of preparation of alcohols. 3  
(b) The scheme for conversion of p-toluidine to m-bromotoluene is depicted below. 4  
Identify intermediates A, B, C & D.



- (c) Complete the following name reaction.



6. (a) Give the products and mechanism for the reactions when benzaldehyde is allowed 4  
to react (i) with 50% NaOH (ii) with  $\text{CN}^-$
- (b)(i) Comment on the optical activity of 1, 2 - dihydroxy cyclohexane - cis and 2  
trans.
- (ii) Draw all possible conformers of ethane. 1
- (c) Give the following conversion. 4
- (i) Salicylaldehyde  $\rightarrow$  orthodihydroxy benzene
- (ii) 3, 3 - dimethyl - 2 - butanone  $\rightarrow$  trimethylacetic acid
- (iii)  $\text{BrCH}_2\text{COCH}_2\text{Ph} \xrightarrow{\text{OR}^-} \text{PhCH}_2\text{CH}_2\text{CO}_2\text{R}$
- (iv) Acetone + Diethyl succinate  $\xrightarrow{t\text{-BuO}^-}$

Note: All Questions are compulsory  
 Use of simple calculator is allowed  
 Figure at right indicate maximum marks

Q1. (a) Attempt any 7 [ 2 marks each]:

[14]

(i) If mean = 86, median = 80, then the approximate value of Mode is:  
 (a) 68 (b) 83 (c) 75 (d) 78

(ii) Which of the average is affected most by extreme values?  
 (a) AM (b) Median (c) Mode (d) None

(iii) The inter-quartile range is 21.83 and 75% of the items lie below 54.5, then Quartile Deviation is:  
 (a) 0.2504 (b) 0.504 (c) 10.915 (d) 3.9931

(iv) If CV = 50, SD = 10 then AM is:  
 (a) 10 (b) 15 (c) 20 (d) 25

(v) If Median and SD are 20 and 4 respectively. If each item is increased by 2 then the Median and SD will be:  
 (a) 20, 4 (b) 18, 4 (c) 22, 6 (d) 22, 4

(vi) If the average runs scored by A is 53 and his standard deviation of runs is 40, and these for B is 45 and 16, then who is more consistent:  
 (a) A (b) B (c) Both (d) None

(vii) In a three coin experiment, x is the number head appeared. Then the expectation of x is:  
 (a) 0.15 (b) 0.015 (c) 1.875 (d) 1.5

(viii) For a binomial distribution mean = 2 and variance = 1.5 then the values of parameters n and p is:  
 (a) 8 and 0.25 (b) 8 and 0.75 (c) 5 and 0.8 (d) 5 and 0.25

(ix) The table value for a Normal distribution,  $P[Z \geq 1.04] = 0.14917$  then  $P[Z \leq 1.04]$  = is:

(a) 0.35083 (b) 0.85083 (c) 0.29834 (d) 0.64917

(b) Attempt any 1:

[1]

(x) To test the hypothesis of equality among several variables the best measure is:  
 (a) Z-test (b) t-test (c) Chi-square test (d) ANOVA



- (xi) In hypothesis test 'Type-I' error means:  
 (a) Reject  $H_0$  when  $H_0$  is true (b) Reject  $H_0$  when  $H_0$  is false (c) Accept  $H_0$  when  $H_0$  is true (d) Accept  $H_0$  when  $H_0$  is false

Q2. (a) Attempt any two ( 4 marks each)

[8]

- (i) The following data gives the grades of 3 students of a professor. Compare the performance of the three using weighted average.

Heads	Marks			weight
	Ram	Jay	Tej	
Assignment	85	78	82	15
Internal	87	91	84	30
External	90	92	93	40

Whose performance is better?

- (ii) For the following distribution, Mode is 960. Find the number of workers of the 600-800 wage class:  
 Wage in Rs : 400-600 600-800 800-1000 1000-1200 1200-1400 1400-1600  
 No of workers: 05 - 30 25 20 10
- (iii) Calculate 7<sup>th</sup> Decile and 75<sup>th</sup> Percentile from the following data:  
 Marks : 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80  
 NO of students: 5 8 9 13 30 20 10 05

(b) Attempt any one (3 marks)

[3]

- (i) The average monthly salary of a group of 20 workers in a small factory is Rs. 2020. There are 5 skilled workers, 8 semiskilled workers and the remaining unskilled workers. The average salary of skilled workers is Rs. 2500, and that of the semi skilled workers is Rs. 2000. What is the average salary of the unskilled workers in that factory?
- (ii) The average daily income for a group of 50 persons was calculated to be Rs. 116. It was later discovered that one figure was misread as RS. 163 instead of the correct value 136. Calculate the correct average income.

Q3. (a) Attempt any two ( 4 marks each)

[8]

- (i) The mean and the standard deviation of a sample size 10 were 10.5 and 3.5. If one more item 15 was added to this group, find the mean and standard deviation of all 11 items.
- (ii) Find Mean Deviation of Mean about Median and it's coefficient for the following data:  
 Marks : 5 6 7 8 9 10  
 Number of students: 7 13 18 8 3 1





- (iii) The mean and the standard deviation of a set of 10 values are 40 and 3 respectively. The mean and the standard deviation of another set of 5 values are 46 and 2 respectively. Find the mean and the standard deviation of the combined set of 15 values.

(b) Attempt any one (3 marks)

[3]

- (i) Discuss the merits of arithmetic mean over median and mode.
- (ii) For a cricket player A, average run = 53 and the SD of the runs = 40. For another player B, average run = 45 and the SD of the runs = 16. Verify who is more consistent?

Q4. (a) Attempt any two (4 marks each)

[8]

- (i) From the frequency distribution find the moments about mean:
- |    |   |   |   |   |   |
|----|---|---|---|---|---|
| X: | 2 | 3 | 4 | 5 | 6 |
| Y: | 1 | 3 | 7 | 3 | 1 |
- (ii) The four raw moments about an arbitrary mean are -1, 11, -19 and 195.8 respectively. By finding the central moments about mean comment about the frequency distribution.
- (iii) Find Karl Pearson's coefficient of skewness for the following data:
- |        |       |       |       |       |       |       |
|--------|-------|-------|-------|-------|-------|-------|
| Class: | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 |
| Freq:  | 5     | 9     | 15    | 17    | 10    | 4     |

(b) Attempt any one (3 marks)

[3]

- (i) Find  $k$  and hence find the expected value of a random variable  $x$  and variance for the probability distribution:
- |          |      |      |      |     |      |      |
|----------|------|------|------|-----|------|------|
| $x$ :    | 0    | 1    | 2    | 3   | 4    | 5    |
| $P(x)$ : | 0.15 | 0.20 | 0.10 | $k$ | 0.30 | 0.20 |
- (ii) A certain drug is given to two patients. Probability of first patients will recover is  $\frac{4}{5}$  and that of second patient will recover is  $\frac{5}{7}$ . Find the probability that (i) both will recover (ii) both will not recover (ii) drug is effective.

Q5. (a) Attempt any two (4 marks each)

[8]

- (i) In a shooting competition, the probability that A hits the target is  $\frac{1}{4}$ . If he fires 5 times, what is the probability that he hits (i) at least 3 times (ii) at least once.
- (ii) A hospital switch board receives on an average of 4 emergency calls in 10 minute interval. What is the probability that (i) There are at most 3 calls in a 10 minute interval (ii) There are exactly 3 emergency calls in 10 minute interval?
- (iii) The income of a group of 10000 persons was found to be normally distributed with mean Rs. 500 and standard deviation Rs. 60. Find the number of persons having income between Rs. 400 and Rs. 600. Given for a standard normal variate  $t$ , the area between  $z=0$  and  $z=1.667$  is 0.4525.



(b) Attempt any one (3 marks)

[3]

(i) Fit a straight line by the method of least squares for the following data:

Year : 2005 2006 2007 2008 2009 2010

Index: 156 210 225 245 260 275

Estimate the index for the year 2011.

(ii) Fit an exponential curve  $y = ab^x$ , from the following data:

Year : 2000 2001 2002 2003 2004

Income(in lakhs): 16 27 33 45 52

Estimate the income for the year 2005



Q6. (a) Attempt any two (4 marks each)

[8]

(i) The average capacity by a capsule can cure a special disease is 0.144 units with a standard deviation of 0.052 units. The researcher has taken a random sample of 121 capsules of some batches and determined that they have a capacity of 0.151. Can the researcher conclude that the sample average capacity is more than the industry average at 10% significance level? [Given that at 10% significance level table value of  $t$  is 1.28]

(ii) Two research laboratories have independently produced drugs that provide relief to asthma patients. The first drug was tested on a group of 85 patients and shown an average relief of 8.5 hours with a sample S.D of 1.8 hours. The second drug was tested on 80 patients producing an average of 7.9 hours of relief and a sample S.D of 2.1 hours. At 5% l.o.s does the second drug provide a significantly shorter period of relief? [given that  $Z_{\alpha}$  value for one tail test for  $\mu_1 < \mu_2$  is -1.645]

(iii) In order to determine if there are significant differences in durability of 3 makes of computers, frequency of repairs in the first year of purchase in 3 samples of each make are observed as follows: [Use 5% l.o.s]

Makes of computers		
A	B	C
5	8	7
6	10	3
8	11	5
9	12	4
7	4	1

Is there a significant difference in the durability? Use ANOVA technique, given that  $F_{0.05}(2,12) = 3.89$ .

(b) Attempt any one (3 marks)

[3]

(i) Two random samples were drawn from 2 normal populations.

A: 66 67 75 76 82 84 88 90 92

B: 64 66 74 78 82 85 87 92 93 90 80

Test whether the two populations have the same variance at 5% level of significance. [Given that  $F = 3.11$  at 5% level for  $\nu_1 = 8$ ,  $\nu_2 = 10$ ]

- (ii) A certain drug is claimed to be effective in curing colds. In an experiment on 328 people with colds, half of them were given the drug and half of them given sugar pills. The patient's reactions to the treatment are recorded in the following table.

	Helped	Harmed	No effect
Drug	104	20	40
Sugar Pills	88	24	52

Test the hypothesis that the drug is no better than sugar pills for curing colds.

$$[\chi^2_{(2, 5\%)} = 5.99]$$



Sem IV (CBGS)

2013-14  
QP Code : BR-14670

09-5-14

(3 Hours)

[ Total Marks : 70

- N. B. :** (1) All questions are compulsory.  
(2) Figures to right indicate full marks.

1. (a) Answer the following :- 12
- (i) Highly lipophilic drugs cross the blood brain barrier. Justify.
  - (ii) Define :- (1) Apparent volume of distribution, (2) Bioequivalence.
  - (iii) Classify different types of receptors based on their transduction mechanisms. Name effector pathways for GPCR.
  - (iv) What is drug potency and efficacy ?
  - (v) Give classification of antiarrhythmic drugs.
  - (vi) What are the clinical uses of skeletal muscle relaxants ?
- (b) (i) Define mutagenicity. 3
- (ii) Enlist factors modifying drug action.
  - (iii) Classify cholinergic nicotinic receptors. Give examples of agonists and antagonists at these receptors.
2. (a) Answer any two of the following :- 8
- (i) Compare and contrast oral route of administration with parenteral route.
  - (ii) What are Phase II synthetic reactions ? Explain briefly the various Phase II reactions.
  - (iii) Give a short note on routes of excretion of a drug.
- (b) Write short notes on any one of the following :- 3
- (i) Explain how paracetamol overdose causes hepatotoxicity.
  - (ii) Discuss nephrotoxicity and its causes.
3. (a) Answer any two of the following :- 8
- (i) Explain the phospholipase C[PLC] :  $IP_3$ -DAG effector pathway of GPCR.
  - (ii) What are nuclear receptors ? Explain the mechanism of action of drugs acting on nuclear receptors.
  - (iii) Write a short note on drug antagonism.
- (b) Answer any one of the following :- 3
- (i) Classify anticholinergic drugs giving their therapeutic uses.
  - (ii) Describe pharmacological actions of alpha adrenergic blockers.

Con. 7998-14.



[ TURN OVER

4. (a) Answer any **two** of the following :- 8
- (i) Classify skeletal muscle relaxants. Differentiate between depolarizing and non depolarizing muscle relaxants.
  - (ii) Give the pharmacological actions of acetylcholine.
  - (iii) Describe synthesis, storage, release and metabolism of catecholamines.
- (b) Answer any **one** of the following :- 3
- (i) Explain the mechanism of action of tyramine.
  - (ii) How does cocaine potentiate the effect of noradrenaline.
5. (a) Answer any **two** of the following :- 8
- (i) Classify betablockers and give their role in management of cardiovascular disease.
  - (ii) Write a short note on Fibrates in antihyperlipidemic therapy.
  - (iii) Give the role of vasodilators in angina pectoris treatment.
- (b) Answer any **one** of the following :- 3
- (i) What is the mechanism of action of calcium channel blockers in cardiac arrhythmias ?
  - (ii) Describe the mechanism of action of digitalis glycosides on the failing heart.
6. (a) Answer any **two** of the following :- 8
- (i) Classify diuretics. Write a short note on potassium sparing diuretics.
  - (ii) Compare and contrast loop diuretics with thiazide diuretics.
  - (iii) Classify adrenergic receptors. Give their location and effects with examples of selective agonists and antagonists.
- (b) Answer any **one** of the following :- 3
- (i) How does age and gender affect drug action ?
  - (ii) Explain how pathological states influence drug action.



**Con. 7998-14.**

- N.B. :** (1) All questions are compulsory.  
(2) Draw neat sketches wherever required.  
(3) Figures to the right indicate full marks.

1. Answer the following :-

- (a) State Gibb's free energy equation. Give its significance in stabilisation of disperse system. 3  
(b) Mention anatomical features of skin. 2  
(c) State factors affecting rectal absorption. 3  
(d) What are the risks associated with use of blood products? 2  
(e) Enlist various quality control tests for ligatures and discuss any one. 3  
(f) What are the pharmaceutical applications of suspension? 2

2. (a) Describe various QC tests and stress tests for emulsions. -4

OR

- (a) Name various homogenisers used in the preparation of disperse system and write a note on 'colloid mill.'  
(b) Describe in detail 'Macrogols' as suppository base. 4  
(c) Discuss metallic wires as sutures. 3

3. (a) Explain DLVO theory. 4  
(b) Elaborate on-Whole Human Blood. 4

OR

- (b) Elaborate on-Gamma Globulin preparations.  
(c) Describe disintegration test for suppository. 3

4. (a) Write a note on Gels. 4  
(b) Mention various methods used for selection of emulsifier and elaborate on any one method. 4  
(c) What are the ideal properties of plasma substitutes. 3

OR

- (c) Describe the methods used for the size reduction of dextran during its manufacturing.

5. (a) Elaborate on Dispersion method for preparation of suspension. 4  
(b) Name the base used in the preparation of Whitfield's ointment and explain the role of salicylic acid in it. 3  
(c) Justify - Viscosity of melted suppository mass is important in manufacturing of suppositories. 4

OR

- (c) Define 'displacement value' and give its significance.

6. (a) Outline the steps involved in manufacture of catgut. 3  
(b) Give an account of additives used in preparation of emulsions. 4

OR

- (b) Write a note on preservation of emulsions.  
(c) Explain physicochemical factors affecting drug absorption. 4



- N.B. : (1) All questions are compulsory.  
(2) Draw a neat labeled diagrams wherever necessary.

1. Answer the following.

- |                                                                        |   |
|------------------------------------------------------------------------|---|
| (a) Give scope of microbiology in pharmaceutical industry.             | 1 |
| (b) Define Resolution limit and give its significance.                 | 2 |
| (c) How to identify bacteria on the basis of morphological characters. | 2 |
| (d) Name the causative agent of leprosy.                               | 1 |
| (e) Name the diagnostic test for typhoid.                              | 1 |
| (f) Define oncogenic viruses and give 2 examples.                      | 2 |
| (g) Name two fungal infections with the causative agent.               | 2 |
| (h) Define Antiseptics and Thermal death time.                         | 2 |
| (i) Name the biological indicator for Radiation sterilization.         | 1 |
| (j) Name two sterility testing media.                                  | 1 |

- |                                                                                      |   |
|--------------------------------------------------------------------------------------|---|
| 2. (a) Distinguish between procaryotes and Eucaryotes.                               | 2 |
| (b) Explain different preservation techniques.                                       | 3 |
| (c) Write a note on cultivation of viruses.                                          | 3 |
| (d) Write in brief mechanism of action and applications of phenol as a disinfectant. | 3 |

- |                                                                                         |   |
|-----------------------------------------------------------------------------------------|---|
| 3. (a) Explain in detail fluorescence microscopy and its applications.                  | 4 |
| (b) Enlist different methods of counting of bacteria and explain any one viable method. | 4 |
| (c) Explain pasteurization.                                                             | 3 |

OR

- |                                      |   |
|--------------------------------------|---|
| (c) Explain radiation sterilization. | 3 |
|--------------------------------------|---|

- |                                                  |   |
|--------------------------------------------------|---|
| 4. (a) Explain economic importance of algae.     | 2 |
| (b) Explain differential media with example.     | 2 |
| (c) Write a note on cultivation of anaerobes.    | 3 |
| (d) Describe in detail moist heat sterilization. | 4 |



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|----------------------------------------------|---|
| 5. (a) Write a note on cell wall of bacteria | 4 |
| OR                                           |   |
| (a) Sporulation in bacteria.                 |   |

- (b) Describe any **one** 3  
    (i) Rickettsial infections  
    (ii) Chlamydial infections.
- (c) Explain reproduction in fungi. 4
6. (a) Explain principle of Acid fast staining. 2  
    (b) Write a note on plasmodium life cycle. 3  
    (c) Describe any one method of disinfectant evaluation. 3  
    (d) Distingusih between (any **one**) 3  
        (i) Electron microscopy and light microscopy  
        (ii) Bacteria and viruses.

