

Q.P. Code : 36176

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B: 1. All questions are compulsory.
2. Draw a neat labelled diagram wherever necessary.

- Q1 Answer the following:
- a) i) Define Resolution limit 01
 - ii) On the basis of oxygen requirement write classification of bacteria. 01
 - iii) Name the causative agent of gas gangrene 01
 - iv) Give two examples of capsule bearing bacteria 01

 - b) i) Draw a neat labelled diagram of growth curve 02
 - ii) Give contributions of Robert Koch in Microbiology 02
 - iii) Explain Enrichment medium with suitable examples 02
 - iv) Enlist the infections caused by Clostridium tetani 02
 - v) Name any two chlamydial infections with the causative agent 02
 - vi) Define oncogenic viruses and give two examples 02
 - vii) Explain Tissue toxicity index 02
 - viii) Explain Microbial limit tests for Staphylococcus aureus 02
- Q.2 a) Describe scanning electron Microscopy 04
- b) Discuss gaseous sterilization with respect to method, mechanism of action and applications 04
- c) Explain tyndallization method of sterilization and its applications 04
- Q.3 a) Write a note on cell wall of gram positive bacteria 04
- b) Enlist counting methods of bacteria and explain any one viable method in detail with its applications 04
- c) Write a note on any one 04
- i) Protozoan infections 04
 - ii) Fungal infections 04
- Q.4 a) Explain lytic cycle of viruses 04
- b) Explain different cultivation methods of anaerobic bacteria with a neat labelled diagram of McIntosh Jar 04
- c) Write a note on biological and economical importance of algae 04
- OR
- c) Write a note on sexual reproduction in fungi 04
- Q.5 a) Explain mode of action, limitations and applications of phenol 04
- b) Discuss any one method of disinfectant evaluation 04
- c) Write a note on biological and chemical indicators used in validation of sterilization 04
- OR
- c) Distinguish between dry heat and moist heat sterilization 04
- Q.6 a) Explain different methods of preservation of bacteria 04
- b) Explain various steps involved in sterility testing of injectables 04
- c) What are different methods to prevent contamination in an aseptic area 04
- OR
- c) Explain design of an aseptic area 04

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| ii) Give contributions of Robert Koch in Microbiology | 02 |
| iii) Explain Enrichment medium with suitable examples | 02 |
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Q. P. Code: 38126

(3 Hours)

- N.B.: 1. All questions are compulsory
 2. Answer all subquestions together
 3. Figures to right indicate full marks

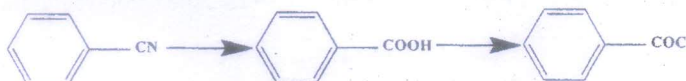
Total Marks: 80

Q1 a. Complete the given table stating the electronic effects of the following functional groups on the benzene nucleus (04)

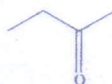
Groups	Inductive effect	Resonance effect
-CHO		
-NH ₂		
-CONH ₂		
C ₆ H ₅ -		

Q1b. Answer the following questions (Any Eight) (16)

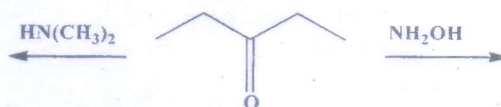
- 1 Identify the reagents to be used for the following reactions:



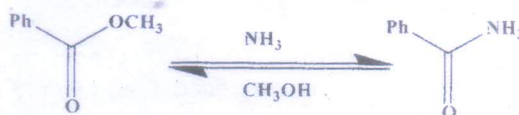
- 2 Depict the tetrahedral intermediate involved in the reaction between benzaldehyde with aniline and predict the product thus formed.
 3 Give the tautomer of the given molecule. State which form is more stable.



- 4 Justify using suitable examples: acetals can be hydrolysed in acid but are stable to bases.
 5 Complete the following reactions:



- 6 Lower the pK_a of HX, better the leaving group ability of X⁻ in carbonyl substitution reactions. Justify using a suitable example.
 7 In the reaction given below, predict whether the rates of the forward and backward reactions are the same:



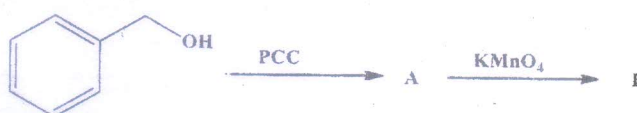
- 8 Draw a picture depicting the HOMO and LUMO of formaldehyde
 9 Equilibrium favours formation of aldehyde cyanohydrins than ketone cyanohydrins. Justify.

Q.2a. Give the mechanism for the following reactions (**Any three**): (06)

1. Kolbe's reaction
2. Cross Cannizzaro reaction
3. Baeyer Villiger oxidation
4. Mannich reaction
5. Transesterification

b Answer the following questions (06)

1. Give the product when chlorobenzene is treated with : (a). KNH_2 in liq. ammonia and (b). aq. NaOH at 340°C .
2. Identify which of the following molecules can undergo nucleophilic aromatic substitution reaction: 2,6-dimethylbromobenzene and bromobenzene. Justify your answer.
3. Identify A and B from the following reaction



Q.3 a Compare the reactivity of amides and acid chlorides (04)

b. Give the products for the following alkenes with the specified reagents (04)

Alkene	$\text{Br}_2, \text{H}_2\text{O}$	NBS, MeOH

c. Attempt the following conversions (**Any four**): (04)

1. Cyclohexanoyl chloride to N,N-dimethylcyclohexanamide
2. Ethyl methyl ketone to 3-Methylpentanol
3. Cyclohexene to hexanedial
4. 2-Methyl-2-pentene to acetone and propanoic acid
5. Acetanilide to p-bromoacetanilide

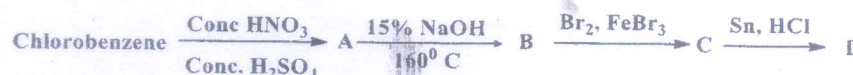
Q.4a: Suggest at least two methods for the preparation of each of the following using organometallic compounds (04)

- i. 2-Phenyl-2-propanol
- ii. 3-methyl-3-pentanol

b. i) Give the mechanism for sulphonation of benzaldehyde (02)

ii) Indicate the position of nitration of 2-chlorobenzoic acid and designate whether the starting aromatic compound is activated or deactivated relative to benzene (02)

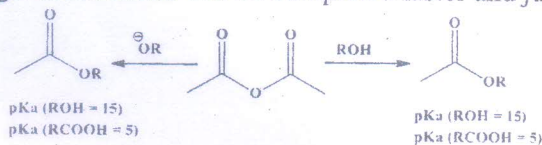
c. Identify A, B, C and D (04)



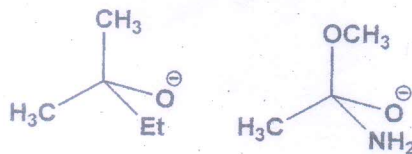
Q.5a. Give the mechanism for acid and base catalyzed hydrolysis of amides. (04)

OR

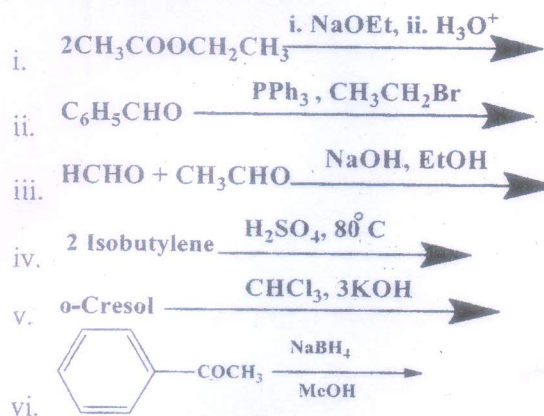
a. Predict which of the given reactions will be completed faster and justify. (04)



b. Predict whether the following intermediates proceed to give substitution or addition products. Justify your answer. (04)

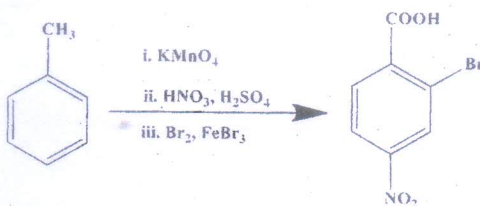


c. Give the products of the following reactions (Any four): (04)

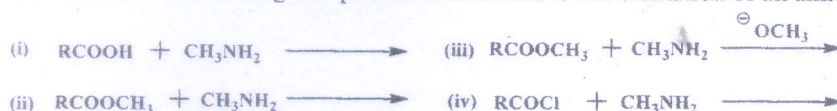


Q.6. a. Give an account of addition of bromine to cis 2-Butene. Specify whether the reaction is stereospecific and/or stereoselective. (04)

b. Predict whether the said order of reaction conditions would yield the desired product. Suggest suitable modifications, if necessary: (04)



c. Which of the following compounds would lead to the formation of an amide? (04)



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

Marks: 80

Q 1a. Answer the following

16

- (i) Define
 - 1) Pharmacodynamics
 - 2) Pharmacokinetics
- (ii) Explain following terms i.e. bioavailability and bioequivalence
- (iii) Explain the term 'receptor' and classify with examples
- (iv) Classify muscarinic receptors and give example of selective antagonist for each subtype
- (v) Give mechanism of action of Enalapril
- (vi) Why HDL is known as good cholesterol?
- (vii) Enlist factors affecting volume of drug distribution
- (viii) Define therapeutic index and give significance

Q 1b. (i) Explain the term "inverse agonist" with example

4

- (ii) Classify antiarrhythmic drugs
- (iii) Enlist factors affecting drug absorption
- (iv) Define- placebo

Q 2 (a) Answer any two of the following

8

- (i) Discuss in-detail pharmacological actions of adrenaline
- (ii) Classify skeletal muscle relaxants. Differentiate between depolarizing and non-depolarizing muscle relaxants.
- (iii) Describe synthesis, storage, and hydrolysis of acetylcholine

Q 2 (b) Answer any one of the following

4

- (i) Discuss various consequences of plasma protein binding on distribution and elimination of drugs
- (ii) Classify routes of administration and discuss advantages and disadvantages of parenteral route over topical route

Q 3 (a) Answer any two of the following

8

- (i) Classify beta blockers and give their role in the management of cardiovascular diseases
- (ii) Classify anti-anginal drugs and write a note on combination therapy used in the treatment of angina
- (iii) Classify anti-hyperlipidemic drugs. Write a note on fibrates

Q 3 (b) Answer any one of the following

4

- (i) Give mechanism of action of organic nitrates
- (ii) Write a note on sodium channel blockers with therapeutic uses

Q 4 (a) Answer any two of the following

8

- (i) Describe synthesis, storage, release, and metabolism of catecholamines
- (ii) Explain in-detail the therapeutic effects of parasympatholytics
- (iii) Classify adrenergic receptors and discuss therapeutic uses of selective agonist and antagonist for each subtype of receptor

Q 4 (b) Answer any one of the following

4

- (i) Classify anticholinesterases and discuss related therapeutic uses
- (ii) Explain the mechanism of action of olmesartan & therapeutic use

- Q 5 (a) Answer any two of the following 8
- (i) What are GPC receptors? Explain role of secondary messengers with example
 - (ii) Discuss ligand gated ion channel receptors in-detail
 - (iii) What are nuclear receptors? Explain the mechanism of action of drugs acting on nuclear receptors
- Q 5 (b) Answer any one of the following 4
- (i) Discuss various routes of excretion with examples of drugs
 - (ii) Describe phase I reactions in-detail with example
- Q 6 (a) Answer any two of the following 8
- (i) Classify diuretics. Discuss role of carbonic anhydrase inhibitors in-detail
 - (ii) Discuss therapeutic uses and complication of diuretics
 - (iii) Compare and contrast loop diuretics with thiazide diuretics
- Q 6 (b) Answer any one of the following 4
- (i) How does gender and body weight affect drug action?
 - (ii) Discuss pathological conditions affecting drug action with example

60

Q.P. Code: 31089

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. All questions are compulsory.
 2. Draw neat and well labelled diagram wherever necessary.

- Q.1 a) Define order of reaction and specific rate constant. 2
- b) Explain concept of diffusion. 2
- c) Explain role of complexation in solubilization. 2
- d) Define the following terms 1.Pharmacokinetics 2.Bioavailability. 2
- e) Classify dispersed systems with examples. 2
- f) Explain dissolution mechanisms. 2
- g) Write the effects of any two factors affecting rate of reaction. 2
- h) Differentiate between lyophilic and lyophobic colloids. 2
- i) Classify drugs as per the BCS giving examples of each class. 2
- J) Explain role of accelerated stability studies in expiration dating of Pharmaceutical dosage forms. 2
- Q.2 a) Explain steady state diffusion and driving forces for diffusion in pharmaceutical Systems. 4
- OR
- a) Give Fick's first and second law of diffusion. 4
- b) Explain any one method of analysis of complexes. 4
- c) Explain DLVO theory. 4
- Q.3 a) Explain various physical and chemical factors influencing the chemical degradation of Pharmaceutical product. 4
- b) Give Noyes Whitney equation and explain significance of the same. 4
- c) Enlist Physiological and physicochemical factors affecting drug absorption. Explain any two in detail. 4
- OR
- c) Give reasons for following:
1. Metastable polymorph is preferred by the formulators.
 2. Small intestine is the primary site for absorption site for majority of drugs.

- Q.4 a) Explain measurement of diffusion by Franz diffusion cell. 4
- b) Classify various modes of drug transport. Explain passive diffusion in detail. 4
- c) Give classification of complexes with examples and explain any one type in detail. 4

- Q.5 a) Enlist the various methods to determine order of a reaction and explain any two in detail. 4
- b) Explain Nernst and Zeta potential. 4

OR

- b) Discuss thermodynamic instability of disperse system.
- C) Write a note on kinetic properties of Colloids. 4

- Q.6 a) 50 % of a first order reaction is complete in 35 minutes. Calculate the time required to complete 90 % of the reaction. 4

OR

- a) The initial concentrations of both ethyl acetate and sodium hydroxide in the mixture were 0.01000 M. The change in concentration, x , of alkali during 30 min was 0.000477 mole/liter. Compute the rate constant.
- b) Enlist theories of emulsification and explain any one in detail. 4
- c) What are protective colloids? Explain how the protective action of colloids is measured. 4

60

SE - Bipharm - choice based - Pharmaceutics I
Sem - IV

11/5/18

Q.P. Code: 40157

(3 Hours)

Total marks 80

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

- (2) Figure to be right indicate full marks.
- (3) Draw neat labelled diagram wherever applicable

- 1. (a) Write importance of pre-formulation. 2
- (b) Write in brief about adhesives and Printing ink. 2
- (c) Explain the importance of polymorphism during preformulation study of monophasic liquids. 2
- (d) Explain in brief impellers used in liquid mixing. 2
- (e) Enlist fundamental and derived properties of powders. 2
- (f) Write in brief about the quality control parameters of powders. 4
- (g) Differentiate between absorbable and non-absorbable sutures. 2
- (h) Write a note on fractionation of plasma by Cohn's technique. 4

- 2. (a) Enlist methods to prepare syrup and write in detail any two methods. 4
- (b) Enlist the techniques of particle size analysis and explain Andreasen pipette method. 4

OR

Give an account of any one particle size reduction mill which works on principle of combined impact and attrition.

- (c) Classify sutures and elaborate on manufacturing of catgut. 4

- 3. (a) Give brief account of development of pharmacy profession in India. 2
- (b) Discuss the large scale filling operation for liquid dosage forms. 4

OR

Write the quality control tests for monophasic liquid dosage form.

- (c) Write in brief about formulation of reconstituted powders. 4
- (d) Explain the need of blood banking. 2

- 4. (a) What is pharmacopoeia and write about International pharmacopoeia. 2
- (b) Discuss in brief plastic as primary packaging material. 4
- (c) Explain the techniques for determination of particle surface area. 4
- (d) Give advantages and limitations of silk as a suture. 2

- 5. (a) Write in brief about solubility and discuss any one solubilisation technique. 4
- (b) Justify, talc should be sterilized before addition to aromatic water. 2
- (c) Explain any one equipment for powder mixing. 2
- (d) Explain plasmapheresis in detail. 4

OR

Write the quality control tests for blood products.

- 6. (a) Define and classify dosage form. 2

OR

Write a note on alternate systems of medicines with reference to Ayurveda.

- (b) Explain various factors affecting rate of filtration. 4
- (c) Explain size separation by sieving. 2
- (d) Elaborate on dextran as plasma volume expander. 4

15/5/18

Q.P. Code : 36176

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S.Y. B Phann Sem IV, CBCS, M & S, Date: 19/5/18

(3 Hours)

[Total Marks: 80]

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

Q.1 (a) Attempt any 7 [2 marks each]

[14]

(i) N^{th} derivative of $y = \frac{1}{9x+2}$ is

(a) $\frac{(-1)^{n-1}(n-1)!9^n}{(9x+2)^n}$ (b) $\frac{(-1)^n(n)!9^n}{(9x+2)^{n+1}}$ (c) $\frac{(-1)^{n-1}(n-1)!9^n}{(9x+2)^{n+1}}$ (d) $\frac{(-1)^n(n)!9^n}{(9x+2)^n}$

(ii) $\int_{-2}^2 x^5 dx$ is;

(a) $\frac{16}{3}$ (b) $\frac{8}{3}$ (c) 0 (d) $\frac{3}{16}$

(iii) The differential equation for the function $y = mx + c$ is

a) $x \frac{dy}{dx} - y = 0$ (b) $\frac{d^2y}{dx^2} = m$ (c) $\frac{d^2y}{dx^2} = 0$ (d) $2x \frac{dy}{dx} + m = 0$

(iv) If $A = \begin{bmatrix} 3 & 1 & 2 \\ 1 & 2 & 3 \\ k & 2 & 4 \end{bmatrix}$ is a singular matrix, then the value of x is:

(a) 1 (b) 2 (c) 4 (d) 6

(v) A group of 50 observations has A.M = 61 and S.D = 8. Another group of 100 observations has A.M = 70 and S.D = 9, then the A.M for combined group of 150 observations.

(a) 67 (b) 77 (c) 87 (d) 97

(vi) For a binomial distribution, mean = 4 and variance = 2.4, then the value of parameters n and p are

(a) 8 and 0.5 (b) 10 and 0.6 (c) 10 and 0.4 (d) None of these

(vii) The table value for a Normal distribution, $P[Z \geq 2.1] = 0.0179$ then $P[Z \leq 2.1] =$

(a) 0.4821 (b) 0.9821 (c) 0.0179 (d) None of these

(viii) $\int \frac{\cos x}{5 + \sin x} dx$ is

(a) $\log |5 + \sin x| + c$ (c) $\log x + c$
(b) $\log |\sin x| + c$ (d) $\log |\cos x| + c$

(ix) The solution of the differential equation $x dx + y dy = 0$ is:

(a) $x^2 + y^2 = c$ (b) $x^2 - y^2 = c$ (c) $x + y = c$ (d) $x - y = c$

(b) Attempt any 1:

[1]

(x) If $A = \begin{bmatrix} 3 & x & y \\ 1 & 2 & z \\ -2 & 2 & 4 \end{bmatrix}$ is a symmetric matrix, then the values of x, y, z are

(a) 2, -1, 3 (b) 2, -2, 1 (c) 1, -2, 2 (d) none of these.

(xi) $\frac{d}{dx}(a^x) = ?$

(a) a^x (b) $\log a$ (c) $a^x \log a$ (d) 0

TURN OVER

- Q2. (a) Attempt any two (4 marks each)** [8]
- (i) Find the N^{th} derivative of $y = \frac{x}{(x+2)(x-2)}$
- (ii) State the Lagrange's Mean Value theorem. Use it to verify for $f(x) = \sin^{-1}x$ in $[0,1]$
- (iii) Using Taylor's series, expand $\sin x$ in ascending powers of $(x - \frac{\pi}{2})$.
- (b) Attempt any one (3 marks)** [3]
- (i) If $y = x^n \log x$, Show that: $y_{n+1} = \frac{n!}{x}$ using Leibnitz's theorem.
- (ii) Verify Rolle's theorem for the function $f(x) = x^2 - 3x + 2$ in $[1,2]$
- Q3. (a) Attempt any two (4 marks each)** [8]
- (i) Evaluate: $\int e^{3x} \sin 4x \, dx$.
- (ii) Prove that: $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x + \cos x} \, dx = \frac{\pi}{4}$
- (iii) The loop of the curve $9y^2 = x(x-2)^2$ rotated about x -axis. Find the volume of the solid formed.
- (b) Attempt any one (3 marks)** [3]
- (i) Evaluate: $I = \int \frac{\cos x}{4\sin^2 x - 25} \, dx$.
- (ii) By using the properties of Definite Integral, Prove $\int_0^{\pi/2} \left(\frac{\cos x}{\sin x + \cos x} \right) \, dx = \frac{\pi}{4}$
- Q4. (a) Attempt any two (4 marks each)** [8]
- (i) Evaluate: $\begin{vmatrix} 1+x & 2 & 3 & 4 \\ 1 & 2+x & 3 & 4 \\ 1 & 2 & 3+x & 4 \\ 1 & 2 & 3 & 4+x \end{vmatrix} = 0$
- (ii) Solve by Cramer's rule: $x + y = 3; y + z = 5; x + z = 4$
- (iii) By using the Adjoint method, find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & -1 \end{bmatrix}$
- (b) Attempt any one (3 marks)** [3]
- (i) Find the Rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$
- (ii) If $A = \begin{bmatrix} 1 & 2 \\ -3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix}$ then find $2A + B$.

TURN OVER

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

(i) Find the particular solution of the differential equation $\frac{dy}{dx} - x = xy^2$, if $y = 1$, when $x = 0$. [8]

(ii) Solve the differential equation: $(x + y) \frac{dy}{dx} = y$

(iii) Find the particular solution of: $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$, when $x=0$, $y=1$ and $\frac{dy}{dx} = 0$.

(b) Attempt any one (3 marks)

(i) Form the differential equation for $y = ae^x + be^{-x}$, where a, b are arbitrary constants. [3]

(ii) Solve the D.E by using substitution: $(x+y)^2 \frac{dy}{dx} = 1$

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

(i) The following data gives the no. of defectives articles by workers in a factory in a month. Find the arithmetic mean. [8]

No. of defective articles	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of workers	5	8	10	12	5

(ii) For the following grouped data, find the modal value:

I.Q. Group	10-30	30-50	50-70	70-90	90-110	110-130	130-150
No. of students	5	10	25	30	15	10	5

(iii) Obtain the value of median for the following distribution:

Daily Sales(Rs.)	1400-	1600-	1800-	2000-	2200-	2400-
	1600	1800	2000	2200	2400	2600
No. of days	12	30	55	40	35	28

(b) Attempt any one (3 marks)

(i) The mean monthly salary paid to 300 employees of a firm is Rs.14,700. The mean monthly salary of 200 male employees is Rs.15,050. Find the mean monthly salary of remaining female employees. [3]

(ii) From the following data, find the missing frequency when mean is 15.38

Size	10	12	14	16	18	20
Frequency	3	7	?	20	8	5

TURN OVER

Hour	Machine wise production		
	A ₁	A ₂	A ₃
1	25	31	24
2	30	39	30
3	36	38	28
4	38	42	25
5	31	35	28

Using ANOVA determine the mean speeds of 3 machines are significantly different
($F_{0.05,2,12} = 3.89$)

(b) Attempt any one (3 marks)

[3]

- (i) A random sample of size 20 from a normal population gives a sample mean of 42 and a sample standard deviation is 6. Test the hypothesis that the population standard deviation is 9. (Given that: table value of χ^2 with 19 d.f at 5% l.o.s. is 15.507)
- (ii) The following data present the yield in quintals of corn on ten subdivisions of equal area of two agriculture plot:

Plot 1:	6.2	5.7	6.5	6.0	6.3	5.8	5.7	6.0	6.0	5.8
Plot 2:	5.6	5.9	5.6	5.7	5.8	5.7	6.0	5.5	5.7	5.5

Test whether two samples taken from two random population have the same variance at 5% l.o.s.

(Given that: the table value F distribution $F_{0.05}(9,9) = 3.1789$.)



**ANJUMAN-I-ISLAM'S
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- SCHOOL OF ENGINEERING & TECHNOLOGY
- SCHOOL OF PHARMACY
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University of Mumbai

Correction in T9934 - S.Y.B.Pharm (Sem-IV) (Choice Based) / T2600 - Mathematics and Statistics
Code: 39901

QP

In Q. 4, 5 and 6 the sub question "a" is of 4 marks instead of 8 marks.

Following are the changes:

Q.4 (a) attempt any one 4 marks

(b) attempt any one 3 marks

Q.5 (a) attempt any one 4 marks

(b) attempt any one 3 marks

Q.6 (a) attempt any one 4 marks

(b) attempt any one 3 marks