AIKTC/KRRC/SoP/ACKN/QUES/2018-19/ **Date:** _____

School: SoP-CBCS **Branch:** SoP **SEM:** IV

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 Chemistry II	BPH_C_401_T		✓	02
2	Physical Pharmacy II	BPH_C_402_T		✓	02
3	Pharmaceutics I	BPH_C_403_T		✓	02
4	Pharmacology I	BPH_C_404_T		✓	02
5	Microbiology	BPH_C_405_T		✓	02
6	Mathematics and Statistics	BPH_C_406_T		✓	02

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

13/05/2019

sem-IV CBCS

(3 Hours)

N.B.: 1. All questions are compulsory **Total Marks: 80**

2. Answer all sub questions together

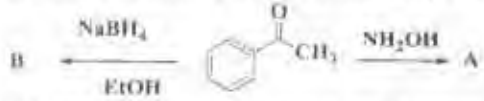
3. Figures to right indicate full marks

Q1 a. Match the following in terms of type of reaction involved. (04)

Sr. No	Name of the reaction	Sr. No.	Types of reaction
1.	Oxymercuration-Demercuration	a.	Nucleophilic substitution at C=O with loss of carbonyl oxygen
2.	Imine formation	b.	Electrophilic aromatic substitution reaction
3.	Friedel Craft acylation	c.	Electrophilic addition to alkene
4.	Cannizzaro reaction	d.	Nucleophilic addition to C=O

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

1 Identify A and B for following reaction.



2 Write structure of tetrahedral intermediates formed for following reactions.

i) Acetaldehyde with water

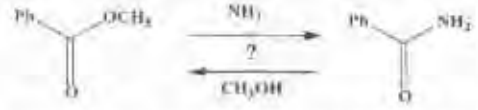
ii) Acetyl chloride with hydroxyl ion

3 Identify whether following compounds are enolizable or non-enolizable when treated in presence of base.

4 Justify using suitable examples: acid or base catalyst increase rate of equilibrium of hemiacetals but does not shift position of equilibrium.

5 Predict the product for following molecule at specified reaction conditions

6. In the reaction given below, predict which of the following reaction is feasible?



7. Draw a picture depicting the HOMO and LUMO of formaldehyde.

8. Aldehydes are more reactive than ketones in nucleophilic addition reaction; account for the same.

9. Using phenol, suggest a suitable scheme for synthesis of 5-nitrosalicylaldehyde.

Q2 a. Give the mechanism for the following reactions (Any three): (06)

i) Kolbe reaction ii) Claissen condensation

iii) Mannich reaction iv) Cannizzaro reaction

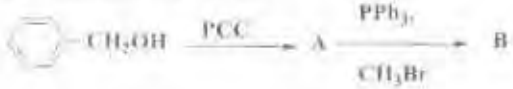
b Answer the following questions (06)

1. Identify product obtained when bromobenzene is treated with:

i) Conc. H_2SO_4 ii) NaOH at high temperature and pressure

2. o-Bromoanisole and m-bromoanisole yield m-anisidine by reaction with $NaNH_2$ and Liq. NH_3. Justify

3. Identify A and B from the following reaction



Q3 a. Compare the reactivity of amides and acid chlorides (04)

b. Suggest suitable reagents to obtain the following products and comment on stereochemistry of addition (04)

1) 2,3-Dibromobutane from 2-butene

2) 2-methylcyclopentanol from 1-methylcyclopentene

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

1) Acetaldehyde to 2-butenal 2) Benzene to p-nitrotoluene

3) 2-methyl-2-butene to 2-methyl-2-butanol 4) Phenol to 2-hydroxy benzaldehyde

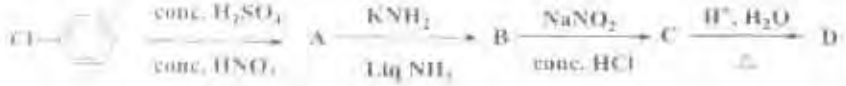
5) Acetophenone to phenylacetate

Q4 a. Using organomagnesium and organolithium compounds, suggest suitable schemes for synthesis of 2-Phenyl-2-butanol and n-Pentanol (04)

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

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

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



Q 5 a. Acid catalyzed hydrolysis of ester is reversible while base catalyzed is irreversible. Justify with mechanism (04)

OR

a. Answer the questions pertaining to following reaction:

i) Predict the product of reaction.

ii) Write the type of reaction involved.

iii) Write in detail mechanism for the same

b. Compound A ($C_7H_5O_4N$) reacts with $POCl_3$ to give compound B ($C_7H_3O_3NCl_2$). Compound B is reduced with Sn/HCl to compound C ($C_7H_5ONCl_2$). Compound C on treatment with ammonia gives D ($C_7H_6ON_2$). Identify A, B, C and D. (04)

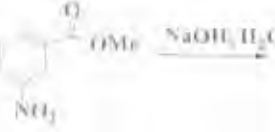
c. Give the products of the following reactions (Any four): (04)

i) 

ii) 

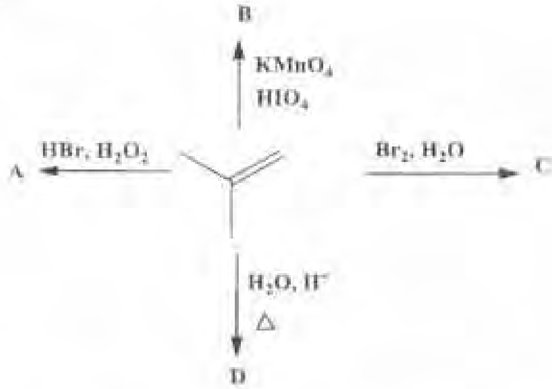
iii) $EtOOCH_2-(CH_2)_3-CH_2-COOEt$ $\xrightarrow{C_2H_5ONa}$

iv) 

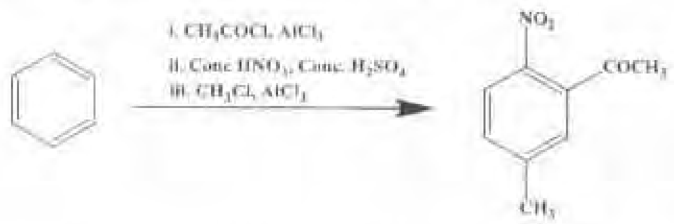
v) 

Q.6. a. Propose mechanisms for synthesis of *syn* and *anti* diol from 2-hexene using suitable reagents. (04)

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



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



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17/05/2019 Sem-IV CBCS

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.
2. Draw neat labelled diagrams wherever necessary.

Q.1 a) Define order of reaction and molecularity. **02**
b) Explain diffusion and its significance. **02**
c) Comment on protein binding. **02**
d) Elaborate on concept of bioavailability. **02**
e) Enlist properties of colloidal suspensions. **02**
f) State the importance of dissolution in pharmaceutical formulations. **02**
g) Differentiate between 1st and 2nd order reaction. **02**
h) Give applications of colloids. **02**
i) What is BCS classification? **02**
j) Define shelf life and give its formula. **02**

Q.2 Answer the following. **04**
a) State & explain Fick's first law of diffusion and permeability.

OR

Elaborate on driving forces for diffusion and permeability. **04**

b) How is complexation measured? Explain with an example. **04**
c) Write short note on DLVO theory. **04**

Q.3 Answer the following.
a) Detail on chemical factors affecting rate of reaction. **04**
b) What are the factors that affect rate of dissolution? **04**
c) Which dosage form related factors affect absorption? Explain any three in detail. **04**

OR

Explain with three examples the effect of physicochemical factors on drug absorption.

Q.4 Answer the following.
a) Define intrinsic dissolution rate and explain how it is measured. **04**
b) Write short note on mechanism of drug absorption. **04**
c) Classify complexes and describe inclusion complex in detail. **04**

Q.5 Answer the following.

a) Derive zero order reaction equation and list out methods for determination of order of reaction. **04**

b) Comment on zeta potential and Nernst potential with help of diagram. **04**

OR

Explain electrical double layer and the effect of electrolytes on dispersions.

c) State various Kinetic properties of colloids. **04**

Q.6 Answer the following.

a) If a chemical reaction takes 23 minutes to complete half part, calculate the time required for completion of 90% reaction. **04**

OR

The concentration of Drug A reduced to 9.6 mg/ml from initial value of 57.9 mg/ml after 65 minutes. Find the reaction rate constant and concentration after 25 minutes.

b) Suggest measures to be taken for ensuring stability of emulsion. **04**

c) Write a short note on protective colloids and Schultz Hardy rule. **04**

21/05/19 SEM-IV CBCS

(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 necessary**

1. (a) Give physiological consideration for parentral route of administration. 2
(b) Write a note on evaluation of plastic as packaging material. 2
(c) Explain on drug-excipient compatibility in preformulation studies of liquid dosage form. 2
(d) Explain the principles of liquid mixing. 2
(e) Enlist fundamental properties of powders and explain specific surface area. 2
(f) Write in brief about conductivity method in particle size analysis. 4
(g) Give an account of polyesters as sutures. 2
(h) Elaborate on: - Collection and storage of whole human blood. 4

2. (a) Write in detail any two methods for preparation of syrup and justify, 'methyl cellulose is used in artificial syrup.' 4
(b) Enlist particle size analysis techniques and explain air permeability method. 4
OR
Give an account of size reduction mill which works on principle of combined impact and attrition.
(c) Discuss Quality Control parameters for ligature and Suture. 4

3. (a) Give status of pharmaceutical industry in India. 2
(b) With the help of Flowchart explain large scale manufacturing of liquids. 4
OR
Write in brief quality control test for monophasic liquid dosage form.
(c) Elaborate on dusting powder formulations. 4
(d) Give Salient features of blood banking procedure. 2

4. (a) Give a note on IP 2010. 2
(b) Discuss in brief types of Glass as packaging material. 4
(c) Explain various quality control tests of powders. 4
(d) Classify ligatures and Sutures. 2

5. (a) Explain the term solubility and write any one solubilisation technique in detail. 4
(b) Comment, 'Nasal drops must be isotonic formulation.' 2
(c) Explain in brief about blenders used for powder mixing. 2
(d) Discuss plasmapheresis in detail. 4
OR
Explain Albumin and Gamma globulin preparations.

6. (a) What is the importance of Quality Assurance in Pharma Industry. 2
OR
Discuss Asava and Arista formulations.
(a) Explain factors affecting the rate of filtration. 4
(b) Define Carr's Index & give its significance. 2
(d) What are the steps in production of clinical grade dextran by fermentation? 4

15/05/2014

Paper / Subject Code: 69102 / Pharmacology - I

Sem - IV CBCS

(3 Hours) (Total Marks : 80)

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

Q.1A) Answer the following : 16

i) Define prodrug. Give one example
ii) Define a) Partial agonist b) Therapeutic index
iii) Define a). Apparent Volume of distribution; b) Clearance
iv) Enlist centrally acting antihypertensive agents
v) Explain the term placebo effect
vi) Write the Mechanism of action of sodium Nitroprusside.
vii) Classify anti- arrhythmic drugs.
viii) 'Salmeterol and ipratropium bromide are preferred in the treatment of asthma'. True or False and justify

Q.1B) Answer the following : 4

i) Define Biotransformation.
ii) Enlist the factors affecting absorption.
iii) Classify adrenergic receptors.
iv) Write name of drugs belongs to class of osmotic diuretics.

Q.2 A) Answer **any TWO** of the following 8

i) Describe the classification of Sympathomimetic agents and discuss the pharmacodynamics of adrenaline on Heart and eye.
ii) Classify anticholinesterases and discuss related therapeutic uses.
iii) Classify skeletal muscle relaxants. Differentiate between depolarizing and non-depolarizing agents.

Q.2 B) Answer **any ONE** of the following : 4

i) Classify different routes of administration. Write the advantages and disadvantages of oral route of administration.
ii) Write a note on plasma protein binding capacity, pH, solubility, and ionized as factors affecting drug distribution with examples.

Q.3 A) Answer any **TWO** of the following : 8

i) Classify antihypertensive drugs. Write a short note on Captopril.
ii) Write a note on pharmacotherapy of calcium channel blockers
iii) Classify anti-anginal drugs. Discuss pharmacotherapy of nitrates.

Q.3 B) Answer any **ONE** of the following : 4

i) Classify antihyperlipidemic agents and write a note on pharmacotherapy of Statins.

ii) Write a short note on Quinidine.

Q.4 A) Answer any **TWO** of the following : 8

i) Classify parasympathomimetic agents and discuss specific therapeutic use.

ii) Classify sympatholytics and discuss related the pharmacotherapy of alpha adrenergic blocking agent

iii) Describe synthesis, storage, release, and metabolism of acetylcholine

Q.4 B) Answer any **ONE** of the following : 4

i) Discuss the clinical uses of Anticholinergic drugs

ii) Discuss the pharmacotherapy of dantrolene

Q.5 A) Answer any **TWO** of the following : 8

i) Discuss physiology of ion channels with examples

ii) Enlist the different families of receptors and explain transducer mechanism of G-protein coupled receptors.

iii) Write a short note on competitive and non competitive antagonism with examples

Q.5 B) Answer any **ONE** of the following : 4

i) Discuss Phase II with example

ii) Write a note on Phase I with example

Q.6 A) Answer any **TWO** of the following : 8

i) Classify Diuretics. Compare and contrast thiazides and potassium sparing diuretics

ii) Write the mechanism of action of high ceiling diuretics with its uses and complications

iii) Elaborate on the role of sodium channel blockers in the management of cardiovascular disorders.

Q.6 B) Answer any **ONE** of the following : 4

i) Enlist patient related factors modifying drug actions. Explain any two factors with example

ii) Write a short note on tolerance and drug dependence.

23/05/2019 SEM-IV CBCS

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Attempt all questions.
2. Draw a neat labelled diagram wherever necessary.

Q.1 Answer the following.

a) Define Numerical aperture with its significance. 2
b) Explain applications of sanitizer using a suitable example. 2
c) Define decimal reduction time with its significance. 2
d) Write any two examples of positive control bacteria used in sterility testing. 2
e) Define sterilization and Name the biological indicator used in moist heat sterilization. 2
f) Explain the significance of differential media in microbiology. 2
g) Write the diagnostic test and causative agent for bacillary dysentery. 2
h) Name any two fungal infections with the name of the causative agent. 2
i) Write the contributions of Louis Pasteur in the fermentation. 2
j) Explain salmonella infections. 2

Q.2 a) Explain transmission electron microscopy using a neat diagram with its applications. 4
b) Write a note on protozoa infections. 4
c) Write in brief total counting methods of bacteria. 4

Q.3 a) Write a note on methods of cultivation of anaerobes. 4
b) Discuss identification of bacteria on the basis of morphological and colony characters. 4
c) Explain continuous cultivation of bacteria using a suitable diagram. 4

OR

c) Distinguish between gram positive and gram negative bacteria.

Q.4 a) Write economic importance of algae. 4
b) Write in detail replication of lysogenic viruses. 4
c) Explain asexual methods of fungal reproduction. 4

OR

c) Write a note on rickettsia infections. 4

Q.5 a) Discuss radiation sterilization with respect to method mechanism of action and application. 4
b) Explain mode of action, limitations and applications of quaternary ammonium compounds. 4
c) Write a note on phenol coefficient method. 4

OR

c) draw a neat labelled diagram of : i) Autoclave ii) Hot air oven 4

Q.6 a) Write a note on principle and applications of laminar air flow unit. 4
b) Explain diffusion bioassay methods of an antibiotic. 4
c) What are limit tests? Write limit tests for Pseudomonas aeruginosa. 4

OR

c) Explain methods of environmentally safe disposal of microbial waste. 4

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27/05/19 Sem - IV CBCS

Duration: 3 Hrs **Maximum 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) If $y=x^5$, then $y_5 = ?$
(a)20 (b) 60 (c) 120 (d) 150

(ii) The value of $\int_1^3 (x^2)dx$ is:
(a)26/3 (b)27/3 (c) 6 (d) 5

(iii) The differential equation for the function $y^2 = 4ax$ is
(a) $2x\frac{dy}{dx} - y = 0$ (b) $2x^2\frac{dy}{dx} - y = 0$ (c) $2x\frac{dy}{dx} + y = 0$ (d) $2x\frac{dy}{dx} - y^2 = 0$

(iv) The inverse of the matrix $A = \begin{bmatrix} 3 & -2 \\ 5 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 4 \\ 6 & -7 \end{bmatrix}$ then $A - 4B + 7I$ (where I is the unit matrix of order 2):
(a) $\begin{bmatrix} 6 & -18 \\ -19 & 39 \end{bmatrix}$ (b) $\begin{bmatrix} 6 & -18 \\ 19 & 39 \end{bmatrix}$ (c) $\begin{bmatrix} 6 & 18 \\ -19 & 39 \end{bmatrix}$ (d) $\begin{bmatrix} 6 & 18 \\ 19 & 39 \end{bmatrix}$

(v) If Median and S.D are 50 and 20 respectively. If each item is increased by 5 then the Median and S.D will be;
(a) 50,20 (b) 45,20 (c) 55,25 (d) 55,20

(vi) If 75% of the items lies above 40 and 75% of the items lies below 60, then co-efficient of Quartile deviation is
(a) 0.46 (b) 0.64 (c) 0.04 (d) 0.20

(vii) Two dice are thrown simultaneously . What is the probability of obtaining sum of the numbers less than 11.
(a) 17/18 (b) 1/12 (c) 11/12 (d) None of these

(viii) For a Poisson variate X, P(X=1) = P(X=2). Find P(X=4)
(a) 0.090224 (b) 0.05288 (c) 0.021100 (d) 0.07684

(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) If $A = \begin{bmatrix} 7 & 3 & 4 \\ -2 & -1 & 0 \\ 5 & 3 & 6 \end{bmatrix}$, then $(A^T)^T$ is_____.
(a) A (b) A^T (c) $A.A^T$ (d) 0

(xi) 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.

Q2. (a) **Attempt any two (4 marks each)** [8]

(i) Find the N^{th} derivative of $y = e^x . cosx . sin3x$

(ii) State the Lagrange's Mean Value theorem. Use it to verify for $f(x)=x^2-5x+6$ in [2,4]

(iii) Using Maclaurin's series, give the expansion of $f(x)=\sin x$

(b) **Attempt any one (3 marks)** [3]

(i) For $f(x) = [\frac{1}{x^2-1}]$, find y_n. Later, find y_4 (i.e n=4) at x=0.

(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: $\int_0^{\frac{\pi}{2}} sin^4 x \, dx$

(ii) Evaluate: $\int e^x cosx \, dx$.

(iii) Find the volume generated by revolving the arc of the curve y = sinx, between the x=0 and $x=\pi$

(b) **Attempt any one (3 marks)** [3]

(i) Evaluate: $I = \int \frac{e^x}{16-e^{4x}} dx$.

(ii) Find the length of the curve $x = a\sin\theta$, $y = a\cos\theta$ from $\theta = 0$ to $\theta = \frac{\pi}{4}$

Q4. (a) **Attempt any one (4 marks each)** [4]

(i) Solve $(1-x)dy-(1+y)dx = 0$. Also find the particular solution, if y = 2 when x =1.

(ii) Solve the following homogeneous differential equations: $\frac{dy}{dx} = \frac{xy+y^2}{x^2+xy}$

(b) **Attempt any one(3 marks)** [3]

(i) Form the differential equation for y = A cosx + B sinx, where A and B are constants.

(iii) Solve $ydx - xdy = 0$

Q5. (a) **Attempt any one (4 marks each)** [4]

(i) By using the Adjoint method, find the inverse of the matrix $A=\begin{bmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & -1 \end{bmatrix}$

(ii) Solve by using the properties of determinant: $\begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix} = 0$

(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 $A^2 - 2B + I$.

Q6. (a) **Attempt any one (4 marks each)** [4]

(i) Calculate the median income from the following data:

Income (in '000 Rs)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Income	10	15	30	50	35	15	5

(ii) The following data gives the weight distribution of students in a class. Find the average Weight of the students .

Wt.(in kgs.)	41	42	43	44	45	46	47	48
No. of students	3	6	8	15	17	12	5	4

(b) Attempt any one(3 marks) [3]

(i) The A.M of 50 observations was found to be 115. It was later noticed that the observation 78 was misread as 87. Find the correct value of the A.M.

(ii) The following are the marks of three students A, B,C in 4 subjects P,Q,R and S respectively. The weights of the subjects are given. Decide which of the three students is the best.

	P	Q	R	S
Marks of A	28	30	40	20
Marks of B	35	25	20	15
Marks of C	30	35	30	20
Weight	4	3	2	1

Q7. (a) **Attempt any two (4 marks each)** [8]

(i) The no. of runs scored by two cricketers A and B in 10 innings of 5 test matches are shown below; Find which cricketer is more consistent.

A	5	20	90	76	102	90	6	108	20	16
B	40	35	60	62	58	76	42	30	30	20

(ii) Hundred students appeared for two examinations. 60 passed the first, 50 passed the second and
30 passed in both. Find the probability that student selected at random
(a) Passed in at least one examinations.
(b) Failed in both the examinations.

(iii) It is stated that optical lenses supplied by a manufacturer are found to be defective follows Poisson distribution, with mean 4. What is the probability that form a random sample of lenses (1) 3 or more are defective. (2) at the most 2 lenses are defective?

(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	2	3	4	5
P(x)	0.1	k	0.4	0.3

(ii) Calculate M.D. from mean and corresponding coefficient of M.D. for the following data representing daily wages (in Rs.) of workers in a factory:

Daily Wages(in Rs.)	63-67	68-72	73-77	78-82	83-87	88-92	93-97
No. of Workers	2	22	19	14	9	4	3

Q8. (a) Attempt any two (4 marks each) **[8]**

(i) In a cross-breeding experiment with plants at certain species 240 offspring were classified in 4 classes w.r.t the structure of their leaves as follows:

Class	I	II	III	IV	Total
Frequency	21	127	40	52	240

According to theory of heredity, the probabilities of the four classes should be in the ratio 1:9:3:3. Are these data consistent with theory?(Given that the table value of χ^2 with 3 d.f at 5% l.o.s. is 7.815)

(ii) In an examination in Psychology 12 students in one class had a mean grade of 78 with a standard deviation of , while 15 students in another class had a mean grade of 74 with a standard deviation of 8. Is there a significant difference between the means of the two groups? (Given: t = 2.060 at 5% level of significance and 25 degrees of freedom.)

(iii) Following are weekly sales records (in '000s of Rs.) of 3 salesmen A,B,and C of a company during 15 sales calls:-

A	25	30	36	38	31
B	31	39	38	42	35
C	24	30	28	25	28

Using ANOVA technique, determine whether Sales of the three salesmen are different. Given value of F for (2,12) d.f. at 5% level of significance is 3.89

(b) Attempt any one(3 marks) **[3]**

(i) Two random samples of 10 & 14 observations were drawn. The sum of squares of deviations from means for each sample were 130.5 & 148.5 resp. Test whether the difference is significant at 5% l.o.s. [$F_{0.05}=(9,13)=2.71$]

(ii) From a random sample of size n=9 is drawn from normal population gave the following observations:
72, 74, 68, 70, 61, 63, 69, 73 and 71.
To test: $H_0: \sigma^2 = 36$ V. $H_1: \sigma^2 \neq 36$ (Use at 10% l.o.s.)
(Given that table value of χ^2 with 8 d.f at 5% l.o.s. is 2.306)