



**MVPS' Dr. Vasant Rao Pawar Medical College, Hospital & Research
Center, Adgaon Nashik -3
Department of Biochemistry**

REFORMS IN EVALUATION OF MBBS GRADUATES

For Phase I MBBS students

Year	Batch 2014-2018	Batch 2019-2020
Pattern of syllabus	Knowledge based	Competency based
Duration of phase I MBBS	1 year	14 Month
Foundation course	Nil	Yes
No. of internal assessment examinations	2	3
Internal assessment exam – theory Marks	Terminal exam 60 Prelim 100	First internal assessment. 100 Second internal assessment 100 Prelims 200
Internal assessment exam – Practical Marks	Terminal exam 40 Prelim 40	First internal assessment. 50 First internal assessment. 50 Prelim 100
Viva	No	Yes
Viva marks(university)	Added in theory marks	Added in practical marks
University examination	Theory – 100 Practical – 60 (Incl. Viva)	Theory – 200 Practical – 100 (Incl. Viva)
Theory lectures	90 hrs	80 hrs
Non didactic Hrs	150hrs	150hrs
Early Clinical exposure	No	Applicable(30hrs)
Self directed learning	No	Applicable(20hrs)
AETCOM	No	Applicable(7hrs)
Sports & ECA	No	Applicable(total 60hrs)
Formative assessment	No	Yes
Log books	No	Yes
Program Design	Program designed for the whole class	Program designed to suit individual learning styles
Driving force for process	Teacher	Learner Led process
Assessment methods	few	Variety of assessment strategies and reliable
Assurance	Participants pass or fail but cannot assure ability to perform	Assurance in end product


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2.5.4 Reforms in the process and procedure in the conduct of evaluation/examination; including Continuous Internal Assessment to improve the examination system.

Biochemistry department of MVPS' Dr. Vasant Rao Pawar Medical College, Hospital & Research Center, has introduced reforms in the examination process (Formative as well as Summative assessment) in a phased manner.

A. Examination Procedures for internal assessment-

The paper setting is done as per the blue print.

The examinations are conducted through central examination unit (CEU) where three sets of papers are set by departmental faculty and submitted to the CEU. On the day of examination, one set selected by the CEU Incharge is selected randomly and then copies are printed. Utmost precautions are taken to avoid Unfair means and bias. After the examination, the assessment is also done at the central assessment centre. The answersheets are evaluated based on the model answer keys by the faculty.

Then evaluated answersheets are given to the students and individually feedback is given to students. The students do self assessment based on the discussion of ideal answers by the teacher.

B. Process of Integrating IT Automation:

1. Digital entry of marks of Centrally assessed Papers is done.
2. For the University examinations, practical Assessment marks are entered through unique software to automatically upload marks directly from answer books to University server online.

C. Continuous Internal Evaluation (CIE)

Formative (Internal) examinations are conducted by department under the supervision of the institutional heads.. Students' improvement is continuously monitored by their mentors and also intimated to their parents, at Parents-teacher meetings by the respective departments and institutional heads. Marks secured in formative examinations are continuously analyzed and feedback is presented before the academic board. In addition to internal assessment examinations, formative assessment in the form of test, submission, spots, viva is conducted.

D. Competency Based Assessment:

For the practical skills, training is done through DOAP, OSPE .Assessment is done as per the protocol provided by the university and the check list.

E. Work Place-Based Assessment:

Students are assessed in the practical laboratories by faculties as per their rotation in batches. DOAP,OSPE are planned for this assessment.

F. Self-Assessment:

1. At the end of each lecture, MCQs are discussed with the students.
2. The probable questions of the topic taught are displayed on the notice board so that students can prepare the answers themselves. Faculty also discuss the ideal answers of internal examinations with the students. Students also do self-analysis through self directed learning and by writing their reflection in the logbooks regularly which is also monitored by the head of the department. Formative assessment also gives them a platform to assess themselves and motivate to study.

G. OSCE / OSPE:

OSPE in the form of check list help to assess the students on uniform platform .It helps to improve cognitive and psychomotor domain of students.



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2.5.3

Reforms

OSPE,

Blue Printing &

Skill module



Dr. Vasant Rao Pawar Medical College, Hospital & Research Centre, Adgaon, Nashik –

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Department of Biochemistry

Marks allotted to each topic of syllabus

Paper I(2019-20)

Topic	Alloted Marks	Multiple choice question			Brief answer question			Short answer question			Long answer question		
		Recall	Comprh ensive	Applicati on base	Recall	Comprehensi ve	Application base	Recall	Comprehensive	Application base	Reca ll	Compreh ensive	Applicati on base
Basic Biochemistry	4	1	1		2								
Enzymes	13	1			2								
Chemistry & metabolism of carbohydrates	13	1				2							10
Chemistry & metabolism of lipids	13	1					2						10
Biological oxidation	9	1		1	2			5					
Xenobiotics	4		1	1	2								
Antioxidants & defence system	12	1	1					5					
Nutrition	11	1	1		2		2	5		5			
Extracellular matrix	3			1	2								
Oncology , oncogenesis & immunity	11		1					5		5			
Biomedical waste	4	1		1	2								
Physical characteristics and chemical composition of CSF	4	1		1	2								
Energy contents of lipids, carbohydrates & proteins in common food items, Advantages of unsaturated fats. Disadvantages of saturated and trans fats in food	11	1						5		5			
AETCOM- 1.4	5												
Total marks	117							5					

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Department of Biochemistry

Marks allotted to each topic of syllabus
Paper II(2019-20)

Topic	Allotted marks	Multiple choice question			Brief answer question			Short answer question			Long answer question			Total Marks
		Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	
Chemistry & metabolism of proteins	15	1			2		2							
Integration & starvation	5										10			
Nucleic acid metabolism	8	1			2			5						
Vitamins	12	1	1	1			2			5				
Water electrolyte balance & acid base balance	12	1		1			2			5				
Mineral metabolism	10	1			2		2	5					10	
Haemoglobin chemistry and metabolism	12		1	1										
Organ function test	9	1		1	2			5			10			
Molecular biology	9	1	1		2			5						
Genetic engineering	8	1			2			5						
Urine: Screening of inborn errors.	8		1		2					5				
Principle, application and working of following lab equipments/techniques: Ph meter, paper chromatography of amino acids, protein electrophoresis, TLC, PAGE, Electrolyte analysis by ISE, ABG analyzer, ELISA, immunodiffusion, auto analyzer, quality control, DNA isolation from blood/tissue	9	2	1	1						5				
TOTAL MARKS	117													

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BLUE PRINTING (2019-20) (Preliminary exam)

Paper I

Topic	Competency No	Weightage
Basic Biochemistry	1.1	1
Enzymes	2.1-2.7	3
Chemistry & metabolism of carbohydrates	3.1-3.10	3
Chemistry & metabolism of lipids	4.1-4.7	3
Biological oxidation	6.6	2
Xenobiotics	7.5	1
Antioxidants & defence system	7.6-7.7	3
Nutrition	8.1-8.5	3
Extracellular matrix	9.1 9.3	1
Oncology , oncogenesis & immunity	10.1-10.5	3
Biomedical waste	11.1	1
Physical characteristics and chemical composition of CSF	11.15	1
Energy contents of lipids, carbohydrates & proteins in common food items, Advantages of unsaturated fats. Disadvantages of saturated and trans fats in food	11.23 & 11.24	3
AETCOM-	Module 1.4	2

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BLUE PRINTING (2019-20) (Preliminary exam)

Paper II

Topic	Competency No.	Weightage
Chemistry & metabolism of proteins	5.1-5.5	3
Integration & starvation	6.1	2
Nucleic acid metabolism	6.2-6.4	2
Vitamins	6.5	3
Water electrolyte balance & acid base balance	6.7-6.8	3
Mineral metabolism	6.9-6.10	2
Haemoglobin chemistry and metabolism	6.11-6.12	3
Organ function test	6.13-6.15	2
Molecular biology	7.1-7.3	2
Genetic engineering	7.4	2
Urine: Screening of inborn errors.	11.5	2
Principle, application and working of following lab equipments/techniques: pH meter, paper chromatography of amino acids, protein electrophoresis, TLC, PAGE, Electrolyte analysis by ISE, ABG analyzer, ELISA, immunodiffusion, auto analyzer, quality control, DNA isolation from blood/tissue	11.16	2

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Weightage for Pre-Clinical Subjects

Sr.no	Clinical application of topic	Weightage
1	The topic have no or little clinical application	1
2	The topic have moderate clinical application	2
3	The topic have high clinical application	3

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Skeleton of question paper

Sr.no	Section	Questions	Actual Marks	Marks with options
1	A	Multiple choice question (20x1)	20	20
2	B	Brief answer question (10x2)	20	22
3		Short answer question (8x5)	40	45
4		Long answer question (10x2)	20	30
		Total marks	100	117

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(Internal assessment I & II) (2019-20)

Weight age for Pre-Clinical Subjects

Sr.no	Clinical application of topic	Weightage
1	The topic have no or little clinical application	1
2	The topic have moderate clinical application	2
3	The topic have high clinical application	3

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Syllabus for (Internal assessment I) 2019-20

Sr.no	Topic	Weightage
1	Cell	1
2	Chemistry & metabolism of carbohydrates	3
3	Chemistry & metabolism of proteins	3
4	Chemistry of Haemoglobin with hemoglobinopathies	3
5	Nutrition	3
6	Enzymes	3
7	Biological oxidation	2
8	Oxidative stress in atherosclerosis	1

Skeleton of question paper (Internal assessment I)

Sr.no	Section	Questions	Actual Marks	Marks with options
1	A	Multiple choice question (20x1)	20	20
2	B	Short answer question (4x5)	20	25
3		Long answer question (10x2)	20	30
4	C	Short answer question (4x5)	20	25
		Long answer question (10x2)	20	30
		Total marks	100	130

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Marks allotted to each topic of syllabus

Topic	Alloted Marks	Multiple choice question			Short answer question			Long answer question		
		Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	Recall	Comprehensive	Application base
Cell	7	1	1				5			
Chemistry & metabolism of carbohydrates	21	2	2	2			5	10		
Chemistry & metabolism of proteins	21	1			5		5	10		
Chemistry of Haemoglobin with hemoglobinopathies	20				5		5			10
Nutrition	20	2	1	2	5			10		
Enzymes	22	2			5		5			10
Biological oxidation	14	2	1	1				10		
Oxidative stress in atherosclerosis	5				5					
Total=	130									

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2019-20

Syllabus for (Internal assessment II)

Sr.no	Topic	Weightage
1	Kidney Function Test	2
2	Liver Function Test	2
3	Chemistry & metabolism of Nucleic Acid	2
4	Chemistry & metabolism of Lipid	3
5	Vitamin	3
6	Integration/Starvation	2
7	Hemoglobin metabolism	3

Skeleton of question paper (Internal assessment II)

Sr.no	Section	Questions	Actual Marks	Marks with options
1	A	Multiple choice question (20x1)	20	20
2	B	Brief answer question (10x2)	20	22
3		Short answer question (8x5)	40	45
4		Long answer question (10x2)	20	30
		Total marks	100	117

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Marks allotted to each topic of syllabus

Topic	Alloted Marks	Multiple choice question			Brief answer question			Short answer question			Long answer question		
		Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	Recall	Comprehensive	Application base	Recall	Comprehensive	Application base
Kidney Function Test	13	2	1	1	2	2		5					
Liver Function Test	13	1	1	2	2		2	5					
Chemistry & metabolism of Nucleic Acid	13	1					2	5		5			
Chemistry & metabolism of Lipid	22	2						5		5	10		
Vitamin	22	1	1	1	2		2			5	10		
Integration/Starvation	13	2	1	1	2	2				5			
Hemoglobin metabolism	21	1	1		2	2				5			10
Total=	117												

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Interpretation of lab reports (25 marks) OSPE

Lab reports- BSL(Random, F/PP)(BI 3.10, BI 11.21, BI 11.17)

BUL (BI 11.21), CREATININE (BI 11.7), SGPT (BI 11.13)

,SGOT(BI 11.13) ,CPK-MB,CK , TOTAL PROTEIN, ALBUMIN(BI 11.8),
LDH,HBA1C(BI 3.10, BI 11.17),LFT(BI 6.14),TFT(BI 11.17) ,LIPID PROFILE(BI 11.9, BI
11.10), ABG analysis (BI 6.8, BI11.1) , Urine report(BI 11.3, BI 11.4, BI 11.20,BI 6.14),
Amylase (BI 11.17), Lipase, Troponin I(BI11.17), electrolytes, B12(BI 6.5), Homocysteine
(BI 4.4), Iron(BI 6.9) TIBC

Student will pick up any of the above lab report randomly .Then based on following points,
assessment will be done-

No	Assessment point	Correct	partially correct	Not able to answer
1	Diagnostic importance of given parameter	3	1.5	0
2	Normal range of the parameter	1	0	0
3	Interpretation of given concentration of the parameter.	3	1	0
4	Correlation of biochemical basis of the result	3	1	0
5	Differential diagnosis	2	1	0
6	Sample collection	1	0	0
7	Various methods of estimation	2	1	0

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Ques.----Interpretation of lab techniques (15 marks) OSPE

Techniques-Electrophoresis (BI 11.16, BI 11.1), chromatography (BI 11.16, BI 11.1), Elisa(BI 11.16, BI 11.1), DNA isolation(BI 11.16), Immunodiffusion (BI 11.16), ISE(BI 11.16), ABG analyzer(BI 11.16, BI 11.1), Spectrophotometer (BI 11.6, BI 11.1), colorimeter (BI 11.6), Spectroscope, PCR(BI 7.4),

Student will be asked to pick up any one technique chit randomly and will be assessed on the following points-

No.	Point	Able to answer correctly	Able to answer partially correct	Not able to answer
1	Principle of the technique	2	1	0
2	Application of the technique	3	1.5	0
3	Procedure in short	2	1	0
4	Clinical correlation of the technique in various diseases	3	1	0
5	Advantages and disadvantages of the technique	4	1	0
6	Types of the technique if applicable	1	0.5	0

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Journal and log book (5marks) OSPE

No.	Assessment Point	Complete	Complete but not checked	Incomplete	Presentation
1	Journal	1.5	1.0	0.5	1.0
2	Log book	1.5	1.0	0.5	1.0

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Journal and log book (10marks) OSPE

No.	Assessment Point	Complete	Complete but not checked	Incomplete	Presentation
1	Journal	3	2	1	2
2	Log book	3	2	1	2

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Q.B Normal urine (15marks) OSPE

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Able to observe and demonstrate all physical characteristics	3	1.5	00
2	Able to calculate specific gravity and comment	2	1	00
3	Able to perform all tests for normal constituents.	5	2.5	00
4	Able to explain the biochemical mechanism for the normal constituent formation.	3	1.5	00
5	Co relate the variation with the disorders.	2	1	00

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Q.B Urine Report (15marks) OSPE

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Able to observe and demonstrate all physical characteristics	3	1.5	00
2	Able to calculate specific gravity and comment	2	1	00
3	Able to perform all tests for abnormal constituents.	6	3(as per the tests done)	00
4	Able to interpret the result and probable diagnosis	2	1	00
5	Able to write the urine report as per standard format.	2	1	00

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Q.A Quantitative estimations (15marks) OSPE

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Written principle and the name of the method	3	1.5	0
2	Done the estimation as per protocol	2	1	0
3	Able to explain the calculations	2	1	0
4	Able to state the normal range	1	-	0
5	Able to interpret the result	1	-	0
6	Able to correlate biochemical basis of the result	3	1.5	0
7	Presentation of the estimation including all headings (method, principle, calculations, O.D., range, interpretation)	3	1.5	0

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Q.A Quantitative estimations (20marks)

OSPE-

Initially a Case history will be given to the student and will be assessed for following points-

Point	Able to do Correctly	Able to do partially correct	Not able to do
Able to diagnose the case as per history given	2	1	0
Able to enlist and correlate the biochemical tests that can be done in given case.	3	1.5	0

After this, the student will be given a quantitative estimation and will be assessed as per the points.

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Written principle and the name of the method	3	1.5	00
2	Done the estimation as per protocol	2	1	00
3	Able to explain the calculations	2	1	00
4	Able to state the normal range	1	-	00
5	Able to Interpret the result	1	-	00
6	Able to correlate biochemical basis of the result	3	1.5	00
7	Presentation of the estimation including all headings(method,principle,calculations.O.D.,range,interpretation)	3	1.5	00

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Q.B Quantitative estimations (10marks) OSPE

OSPE-

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Written principle and the name of the method	2	1	00
2	Done the estimation as per protocol	2	1	00
3	Able to perform and explain the calculations	1	0.5	00
4	Able to state the normal range	1	0.5	00
5	Able to interpret the result with biochemical basis.	3	1.5	00
6	Presentation	1	0.5	00

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Q.B Urine Report (10marks) OSPE

OSPE-

No	Assessment point	Able to do Correctly	Able to do partially correct	Not able to do
1	Able to observe and demonstrate all physical characteristics	2	1	00
2	Able to calculate specific gravity and comment	2	1	00
3	Able to perform all tests for abnormal constituents.	3	1.5	00
4	Able to interpret the result and probable diagnosis	1	1.5	00
5	Able to write the urine report as per standard format.	2	1	00

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Quality Control (10marks) OSPE

SET-1

No.	Question	Accurately	Partially	No
1	Define Quality control.	2	1	0
2	State the types of Quality control	2	1	0
3	Define Accuracy and Precision	2	1	0
4	Types of errors in Quality control	2	1	0
5	What is VIS	2	1	0

SET-2

No.	Question	Accurately	Partially	No
1	Define Quality control.	2	1	0
2	What is VIS	2	1	0
3	Interpret the given VIS	2	1	0
4	Types of errors in Quality control	2	1	0
5	Name any two charts used for interpreting the quality status	2	1	0

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SPOTS

(Each spot carries one mark)

1. Write the principal for the technique of.

(Electrophoresis / Colorimeter / ISE/ABG analyser/PCR/DNA isolation/Elisa.Chromatography)

2. Identify and write its use.

-Separating funnel. Urinometer, Spectroscope, Electrophoretic tank, Chromatography chamber, Cuvette
Colorimeter, Filter.

3. Lab reports.

Interpret and comment on the probable diagnosis

Diabetic profile. SGOT. CPK. LDH. LFT. KFT. PSA. Amylase. Lipase. TFT. HbA1c. Urine report. Lipid Profile.
Electrophoresis. B12. Homeocysteine. Trop I. ABG, Electrolytes.

4. Case history.

Comment on diagnosis.

5. Pictures.

Identify and comments on the given case.

Kwashiorkor Marasmus. Bitots spots Scurvy Gout Tetany Rickets.

6. Quality control.

Define accuracy and precision

Define quality control.

What is EQAS & IQAS.

If VIS of _____ is >-----Interpret the result.

7. Test.

Jaffes test. Benedict test. Benzidine. Hays sulphur Fauchets Heat coagulation test. Specific urease test.

8. Identify and write the application of the given technique.

9. GTT graphs.(identify and comment on graph)

10. Lab reports.

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Spot number 1. Write the principal for the technique.

Spot number 2. Identify and write its use.

Spot number 3. Interpret and comment on the probable Diagnosis

Spot number 4. Comment on diagnosis and related biochemical investigation

Spot number 5. Identify and comments on the given case.

Spot number 6. Quality Control.

Spot number 7. Test

Spot number 8. Identify and write the application of the given technique

Spot number 9. GTT graphs.

Spot number 10. Lab reports.

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Spot number 3.

Interpret and comment on the probable Diagnosis

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Spot number 3.

Interpret and comment on the probable Diagnosis

Spot number 4.

Comment on diagnosis and related biochemical investigation

Spot number 4.

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Comment on diagnosis and related biochemical investigation

Spot number 5. Identify and comments on the given case.

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Spot number 6. Quality Control.

Define accuracy and precision

Spot number 6. Quality Control.

Define quality control.

Spot number 6. Quality Control.

If VIS of Blood Glucose in EQAS is > 235

Interpret the report.

Spot number 7. Write the significance of the test

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Spot number 7. Write the significance of the test

Spot number 8.

Identify and write the application of the given technique

Spot number 8.

Identify and write the application of the given technique

Spot number 8.

Identify and write the application of the given technique

Spot number 9. Identify and comment on graph

Spot number 9. Identify and comment on graph

Spot number 9. Identify and comment on graph

Spot number 10. Interpret the given lab report.

Spot number 10. Interpret the given lab report.

Spot number 10. Interpret the given lab report.



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Date: - 06/03/2020

Answer Key-Spots

Sr no.	Spots	BatchA	BatchB	BatchC
1	Write the principal for the technique.	Electrophoresis	Colorimeter	Chromatography
2	Identify and write its use.	Filter	Urinometer	Electrophoresis Tank
3	Interpret and comment on the probable Diagnosis	CPK-195IU/L Elevated and patient might be having MI	LFT-Obstructive joundice	Creatinine Raised urea Raised probable Diagnosis is Renal failure
4	Comment on diagnosis and related biochemical investigation	Galactosemia	Vitamina deficiency Nightblindness	Lecsh Nyhan syndrome
5	Identify and comments on the given case.	Kwashiorkor	Bitots spots	Rickets
6	Quality Control.	Define quality control	Define accuracy & Precision	VIS is above 200, Hence not acceptable wrong reporting is going on, Needs to take urgent measures to resolve the problem.
7	Write the significance of the test	Heat coagulation Test (Protein detection)	Benedict's Test (Reducing sugars)	Benzidine test (Blood detection in urine)
8	write the application of the given technique	Elisa	DNA isolation	Immunodiffusion
9	Identify and comment on graph	Normal	Diabetic mellitus	Normal
10	Lab reports	LFT-Haemolytic	Diabetic profile	HbA1c

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