

## **CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES**



### **VALUE ADDED COURSE DEPARTMENT OF BIOTECHNOLOGY**

**CMS  
COLLEGE  
KOTTAYAM  
(AUTONOMOUS)**



ESTD:1817



**Course Credits: 2 Credits**

**Theory: 18 Hours**

**Practical: 18 Hours**

**COURSE CO-ORDINATOR**

**Renji Varghese MSc, MA, BEd, PGDBI, DMLT**

**Assistant Professor**

**Department of Biotechnology**

**CMS College Kottayam**


### **OBJECTIVES**

- Operate and take care of various laboratory equipments.
- Perform Pathological, Biochemical and Microbiological diagnostic procedures/techniques.
- Give awareness to the public about various health hazards.
- Act as a distributor of diagnostic kits and reagents.
- Establish a Clinical Laboratory with the recognition of Government and support of qualified Pathologists, Microbiologists, Biochemists and Laboratory Technicians.



**CMS COLLEGE KOTTAYAM (AUTONOMOUS)**  
**DEPARTMENT OF BIOTECHNOLOGY**  
**VALUE ADDED COURSE (2021-2022)**  
**SECOND YEAR B.Sc. BOTANY AND BIOTECHNOLOGY (Double Main)**  
**CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES**  
**STUDENT ENROLLMENT LIST**

Sl. No.	UPRN	Name of Student	Male / Female	Urban / Rural
1	202112101	ABHIRAMI BABU	Female	Rural
2	202112102	ADITHYA S PRASAD	Female	Rural
3	202112103	AISWARYA S	Female	Urban
4	202112104	ANANDU PRASAD	Male	Urban
5	202112107	APARNNA M NAIR	Female	Rural
6	202112108	ARCHA ANU EAPEN	Female	Urban
7	202112109	ARJUN BINU	Male	Rural
8	202112110	ASHTAMI S	Female	Rural
9	202112111	ATHULYA R	Female	Urban
10	202112112	JINITHA ROSEMI PRAKASH	Female	Rural
11	202112113	LEKSHMI I	Female	Urban
12	202112114	MOHAMED ASLAM K S	Male	Rural
13	202112115	MOHAMMED NIHAL T N	Male	Urban
14	202112116	NAMITHA P NAIR	Female	Urban
15	202112117	NAVANEETH ANIL	Male	Rural
16	202112118	NEKHA M MOHAN	Female	Urban
17	202112119	NIKHILA ANNIE MATHEW	Female	Urban
18	202112120	RISHI ARVIND	Male	Urban
19	202112121	S R ATHIRA	Female	Urban
20	202112122	S SREEJITH	Male	Urban
21	202112123	SHAFNA NAUSHAD	Female	Rural
22	202112124	SREEKALA SHREEJIT SARMA	Female	Rural
23	202112125	T KAVYA RAJ	Female	Rural

  
**Renji Vazghese**  
 Name and Signature of the

Co-ordinator


(College Seal)

Name and Signature of the  
 Principal



**CMS COLLEGE KOTTAYAM (AUTONOMOUS)**  
**DEPARTMENT OF BIOTECHNOLOGY**  
**VALUE ADDED COURSE (2021-2022)**  
**SECOND YEAR B.Sc. BOTANY AND BIOTECHNOLOGY (Double Main)**  
**CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES**  
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Sl. No.	UPRN	Name of Student	Male / Female	Urban / Rural
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8	202112110	ASHTAMI S	Female	Rural
9	202112111	ATHULYA R	Female	Urban
10	202112112	JINITHA ROSEMI PRAKASH	Female	Rural
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12	202112114	MOHAMED ASLAM K S	Male	Rural
13	202112115	MOHAMMED NIHAL T N	Male	Urban
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19	202112121	S R ATHIRA	Female	Urban
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21	202112123	SHAFNA NAUSHAD	Female	Rural
22	202112124	SREEKALA SHREEJIT SARMA	Female	Rural
23	202112125	T KAVYA RAJ	Female	Rural

  
**Renji Vazghese**  
 Name and Signature of the

Co-ordinator

(College Seal)

Name and Signature of the  
 Principal

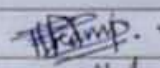

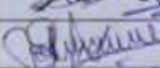

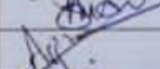

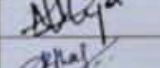
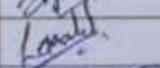

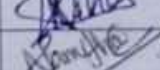
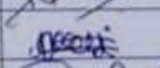
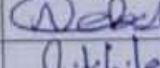
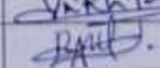
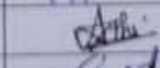
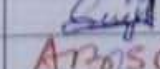

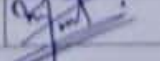
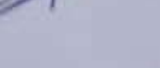

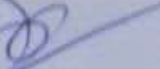



DEPARTMENT OF BIOTECHNOLOGY

VALUE ADDED COURSE (2021 - 2022)

SECOND YEAR B.Sc. BOTANY AND BIOTECHNOLOGY (Double Main)

CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES

(ATTENDANCE – THEORY EXAM)

Sl. No.	UPRN	Name of Student	Signature
1	202112101	ABHIRAMI BABU	
2	202112102	ADITHYA S PRASAD	
3	202112103	AISWARYA S	
4	202112104	ANANDU PRASAD	
5	202112107	APARNA M NAIR	
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22	202112124	SREEKALA SHREEJIT SARMA	
23	202112125	T KAVYA RAJ	


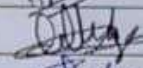
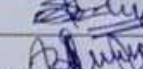



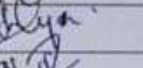
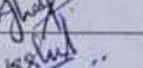

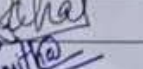
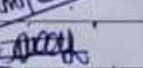
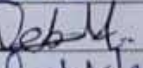
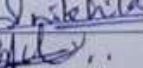
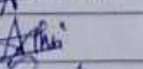


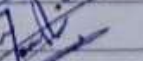




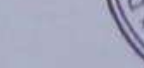
Name and Signature of the Co-ordinator: Renji Varghese







**DEPARTMENT OF BIOTECHNOLOGY**  
**VALUE ADDED COURSE (2021 - 2022)**  
**SECOND YEAR B.Sc. BOTANY AND BIOTECHNOLOGY (Double Main)**  
**CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES**  
**(ATTENDANCE - PRACTICAL)**

Sl. No.	UPRN	Name of Student	Signature
1	202112101	ABHIRAMI BABU	
2	202112102	ADITHYA S PRASAD	
3	202112103	AISWARYA S	
4	202112104	ANANDU PRASAD	
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15	202112117	NAVANEETH ANIL	
16	202112118	NEKHA M MOHAN	
17	202112119	NIKHILA ANNIE MATHEW	
18	202112120	RISHI ARVIND	
19	202112121	S R ATHIRA	
20	202112122	S SREEJITH	
21	202112123	SHAFNA NAUSHAD	<b>Absent</b>
22	202112124	SREEKALA SHREEJIT SARMA	
23	202112125	T KAVYA RAJ	

Name and Signature of the Co-ordinator: Renji Varghese







DEPARTMENT OF BIOTECHNOLOGY

VALUE ADDED COURSE (2021 - 2022)

SECOND YEAR B.Sc. BOTANY AND BIOTECHNOLOGY (Double Main)

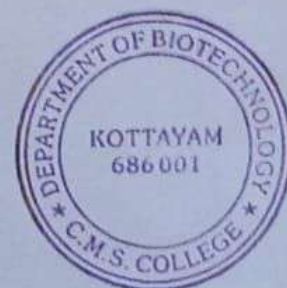
CERTIFICATE IN ROUTINE CLINICAL LABORATORY TECHNIQUES

(ATTENDANCE - THEORY)

Sl. No.	UPRN	Name of Student	Signature		
			10/1/22	11/1/22	12/1/22
1	202112101	ABHIRAMI BABU			
2	202112102	ADITHYA S PRASAD			
3	202112103	AISWARYA S			
4	202112104	ANANDU PRASAD			
5	202112107	APARNNA M NAIR			
6	202112108	ARCHA ANU EAPEN			
7	202112109	ARJUN BINU			
8	202112110	ASHTAMI S			
9	202112111	ATHULYA R			
10	202112112	JINITHA ROSEMI PRAKASH			
11	202112113	LEKSHMI I			
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13	202112115	MOHAMMED NIHAL T N			
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15	202112117	NAVANEETH ANIL			
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17	202112119	NIKHILA ANNIE MATHEW			
18	202112120	RISHI ARVIND			
19	202112121	S R ATHIRA			
20	202112122	S SREEJITH			
21	202112123	SHAFNA NAUSHAD	Absent	Absent	Absent
22	202112124	SREEKALA SHREEJIT SARMA			
23	202112125	T KAVYA RAJ			

Name and Signature of the Co-ordinator: Renji Varghese

12/1/22

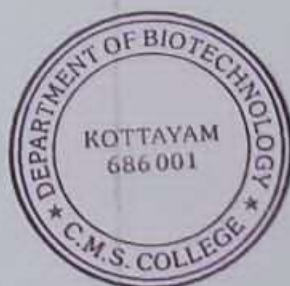


Evaluation of the course consists of Internal assessment of 60 marks and External assessment of 40 marks. Attendance, Seminar, Assignment and Test paper were the components of Internal assessment. Final External assessment was done on 31 January 2022.

22 Students appeared the final assessment and 22 students passed the course. Marks and Grades secured by the students were attached separately. Based on the feedback by the students, it was found that the students are satisfied with the theoretical, practical and evaluation pattern of the value-added course. Students observed the importance of value-added courses for getting more exposure to the laboratory tools and techniques of their core programme.



**Mr. Renji Varghese**  
(Course Co-ordinator)





CMS COLLEGE KOTTAYAM (AUTONOMOUS)

Value Added Course (2021-2022)

DEPARTMENT OF BIOTECHNOLOGY

Second Year B.Sc. Botany & Biotechnology (Double Main)

## ***Certificate in Routine Clinical Laboratory Techniques***

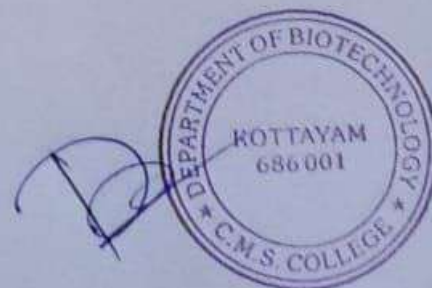
### **Report**

The value-added course *Certificate in Routine Clinical Laboratory Techniques* was designed with the objective to provide theoretical knowledge and hands on exposure to the students for equipping them to operate and take care of various laboratory equipments and to perform Pathological, Biochemical and Microbiological diagnostic procedures.

The course was started with expected outcomes of understanding the basic concepts of Clinical Laboratory Techniques. This course is expected to help students in gaining experience in laboratory practices and skills in designing a clinical laboratory and to create awareness about the prophylactic measures of various infections and diseases.

The theory part comprising of 18 hours was conducted on 2022 January 10, 11 and 12 (6 hours per day) and classes were taken by Mr. Renji Varghese, Assistant Professor, Department of Biotechnology, CMS College Kottayam.

The 18 hours of practical sessions were conducted during 2022 January 27, 28, and 29 by Mr. Renji Varghese.











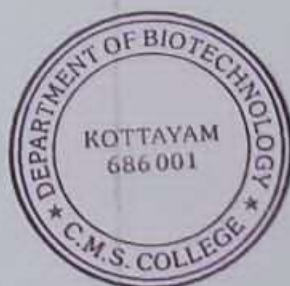


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(Course Co-ordinator)





CMS COLLEGE KOTTAYAM (AUTONOMOUS)

Value Added Course (2021-2022)

DEPARTMENT OF BIOTECHNOLOGY

Second Year B.Sc. Botany & Biotechnology (Double Main)

## ***Certificate in Routine Clinical Laboratory Techniques***

### **Report**

The value-added course *Certificate in Routine Clinical Laboratory Techniques* was designed with the objective to provide theoretical knowledge and hands on exposure to the students for equipping them to operate and take care of various laboratory equipments and to perform Pathological, Biochemical and Microbiological diagnostic procedures.

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The 18 hours of practical sessions were conducted during 2022 January 27, 28, and 29 by Mr. Renji Varghese.



**INTERNAL ASSESSMENT (Theory) FOR VALUE ADDED COURSES**

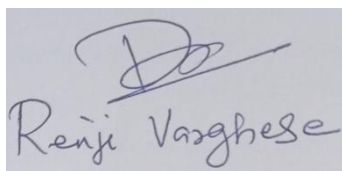
Name of the College: CMS COLLEGE KOTTAYAM (Autonomous)

Year: 2021 – 2022

COURSE: Certificate in Routine Clinical Laboratory Techniques								REMARKS
Sl. No.	Reg. No.	Name of Candidate (s)	IN SEM EXAMINATIONS					
			Attendance	Seminar (s)	Assignment (s)	Test Paper (s)	TOTAL	
			Max: 10 Marks	Max: 10 Marks	Max: 10 Marks	Max: 30 Marks	Max: 60 Marks (1+2+3+4)	
1	202112101	ABHIRAMI BABU	10	10	10	21	51	
2	202112102	ADITHYA S PRASAD	10	10	10	21	51	
3	202112103	AISWARYA S	10	10	10	19	49	
4	202112104	ANANDU PRASAD	10	10	10	19	49	
5	202112107	APARNNA M NAIR	10	10	10	24	54	
6	202112108	ARCHA ANU EAPEN	10	10	10	24	54	
7	202112109	ARJUN BINU	10	10	10	21	51	
8	202112110	ASHTAMI S	10	10	10	19	49	
9	202112111	ATHULYA R	10	10	10	21	51	
10	202112112	JINITHA ROSEMI PRAKASH	10	10	10	18	48	
11	202112113	LEKSHMI I	10	10	10	24	54	
12	202112114	MOHAMED ASLAM K S	10	10	10	19	49	



13	202112115	MOHAMMED NIHAL T N	10	10	10	11	<b>41</b>	
14	202112116	NAMITHA P NAIR	10	10	10	19	<b>49</b>	
15	202112117	NAVANEETH ANIL	10	10	10	14	<b>44</b>	
16	202112118	NEKHA M MOHAN	10	10	10	24	<b>54</b>	
17	202112119	NIKHILA ANNIE MATHEW	10	10	10	25	<b>55</b>	
18	202112120	RISHI ARVIND	10	10	10	25	<b>55</b>	
19	202112121	S R ATHIRA	10	10	10	26	<b>56</b>	
20	202112122	S SREEJITH	10	10	10	16	<b>46</b>	
21	202112123	SHAFNA NAUSHAD	0	0	0	0	<b>0</b>	<b>ABSENT</b>
22	202112124	SREEKALA SHREEJIT SARMA	10	10	10	19	<b>49</b>	
23	202112125	T KAVYA RAJ	10	10	10	25	<b>55</b>	



Renji Varghese

Name and Signature of the  
Co-ordinator

(College Seal)

Name and Signature of  
Principal

**VALUE ADDED COURSES - END SEMESTER EXAM RESULTS**

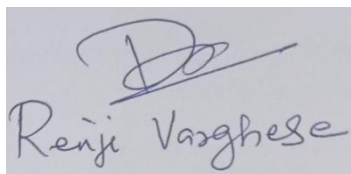
Name of the Department: **BIOTECHNOLOGY**

Name of the College: **CMS COLLEGE KOTTAYAM (Autonomous)**

Year: 2021– 2022

<b>COURSE: Certificate in Routine Clinical Laboratory Techniques</b>			
<b>Sl. No.</b>	<b>Reg. No.</b>	<b>Name of Candidate (s)</b>	<b>End Sem Exam Max Marks: 40</b>
1	202112101	ABHIRAMI BABU	<b>27</b>
2	202112102	ADITHYA S PRASAD	<b>27</b>
3	202112103	AISWARYA S	<b>25</b>
4	202112104	ANANDU PRASAD	<b>25</b>
5	202112107	APARNNA M NAIR	<b>31</b>
6	202112108	ARCHA ANU EAPEN	<b>32</b>
7	202112109	ARJUN BINU	<b>28</b>
8	202112110	ASHTAMI S	<b>25</b>
9	202112111	ATHULYA R	<b>27</b>
10	202112112	JINITHA ROSEMI PRAKASH	<b>24</b>
11	202112113	LEKSHMI I	<b>32</b>
12	202112114	MOHAMED ASLAM K S	<b>25</b>
13	202112115	MOHAMMED NIHAL T N	<b>14</b>

14	202112116	NAMITHA P NAIR	25
15	202112117	NAVANEETH ANIL	18
16	202112118	NEKHA M MOHAN	32
17	202112119	NIKHILA ANNIE MATHEW	33
18	202112120	RISHI ARVIND	33
19	202112121	S R ATHIRA	34
20	202112122	S SREEJITH	21
21	202112123	SHAFNA NAUSHAD	ABSENT
22	202112124	SREEKALA SHREEJIT SARMA	25
23	202112125	T KAVYA RAJ	33



Renji Varghese

Name and Signature of the  
Co-ordinator

(College Seal)

Name and Signature of  
Principal



Form B:

**VALUE ADDED COURSES**

**MARK SHEET**

Name of the Course: **Certificate in Routine Clinical Laboratory Techniques**

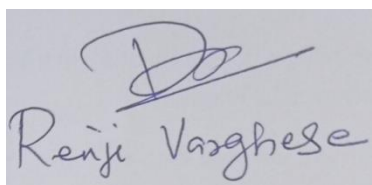
Year: **2021 – 2022**

**SEMESTER: IV (UG Second Year) (2020 Admission)**

**DEPARTMENT: BIOTECHNOLOGY**

Sl. No.	Reg. No.	Name of Candidate (s)	END SEMESTER	IN SEMESTER	TOTAL: Max: 100	% of Marks	G R A D E
			Max: Marks 40	Max: Marks 60			
1	202112101	ABHIRAMI BABU	27	51	78	78	A
2	202112102	ADITHYA S PRASAD	27	51	78	78	A
3	202112103	AISWARYA S	25	49	74	74	B+
4	202112104	ANANDU PRASAD	25	49	74	74	B+
5	202112107	APARNNA M NAIR	31	54	85	85	A+
6	202112108	ARCHA ANU EAPEN	32	54	86	86	A+
7	202112109	ARJUN BINU	28	51	79	79	A
8	202112110	ASHTAMI S	25	49	74	74	B+
9	202112111	ATHULYA R	27	51	78	78	A
10	202112112	JINITHA ROSEMI PRAKASH	24	48	72	72	B+
11	202112113	LEKSHMI I	32	54	86	86	A+
12	202112114	MOHAMED ASLAM K S	25	49	74	74	B+

13	202112115	MOHAMMED NIHAL T N	14	41	55	55	B
14	202112116	NAMITHA P NAIR	25	49	74	74	B+
15	202112117	NAVANEETH ANIL	18	44	62	62	B
16	202112118	NEKHA M MOHAN	32	54	86	86	A+
17	202112119	NIKHILA ANNIE MATHEW	33	55	88	88	A+
18	202112120	RISHI ARVIND	33	55	88	88	A+
19	202112121	S R ATHIRA	34	56	90	90	A+
20	202112122	S SREEJITH	21	46	67	67	B+
21	202112123	SHAFNA NAUSHAD	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
22	202112124	SREEKALA SHREEJIT SARMA	25	49	74	74	B+
23	202112125	T KAVYA RAJ	33	55	88	88	A+



Name and Signature of the  
Co-ordinator

(College Seal)

Name and Signature of  
Principal

# CMS COLLEGE KOTTAYAM (Autonomous)

Value Added Course – Certificate in Routine Clinical Laboratory Techniques

## Theory Examination

Maximum Marks: 40 (40 x 1 = 40 Marks)

Time: 1 Hour

(Choose the most appropriate option) (No negative marking)

1. Occult blood is detected in \_\_\_\_\_
  - a. Urine
  - b. Blood
  - c. Sputum
  - d. **Stool**
2. Length of Wintrobe's pipette
  - a. 30 cm
  - b. 20 cm
  - c. **110 mm**
  - d. 200 mm
3. Anticoagulant used for Blood cell count
  - a. **EDTA**
  - b. Citrate
  - c. Oxalates
  - d. Heparin
4. Identify the agranulocyte
  - a. Eosinophil
  - b. Neutrophil
  - c. Basophil
  - d. **Monocyte**
5. The cap colour of the blood tube for ESR
  - a. Red
  - b. Lavender
  - c. Green
  - d. **Black**
6. Vacutainer with \_\_\_\_\_ cap is used for blood sugar estimation
  - a. Purple
  - b. **Grey**
  - c. Green
  - d. Black
7. Identify the smallest WBC
  - a. **Lymphocyte**
  - b. Eosinophil
  - c. Monocyte
  - d. Neutrophil
8. Ratio of anticoagulant to blood for ESR
  - a. 9:1
  - b. **1:4**
  - c. 1:9
  - d. 4:1
9. Normal range of RBC count
  - a. 4000 – 11000 cells/mm<sup>3</sup>
  - b. 1.5 – 4.5 lakhs cells/mm<sup>3</sup>
  - c. **4.5 – 5.5 million cells/cubic mm**
  - d. 4000 – 11000 cells/100 ml
10. The least abundant WBC
  - a. Eosinophil
  - b. Neutrophil
  - c. **Basophil**
  - d. Lymphocyte
11. Pregnancy test is usually done using \_\_\_\_\_
  - a. **Urine**
  - b. Blood
  - c. Sputum
  - d. Stool
12. Identify the Blood Group with anti-H
  - a. O Negative
  - b. AB Negative
  - c. O Positive
  - d. **Bombay Group**
13. A normal constituent in urine
  - a. Glucose
  - b. **Urea**
  - c. Albumin
  - d. Bilirubin
14. The sample for AFB staining
  - a. Stool
  - b. CSF
  - c. Blood
  - d. **Sputum**
15. Macroscopic examination of semen detects \_\_\_\_\_
  - a. Motility of Sperms
  - b. Sperm Count
  - c. **Viscosity of Semen**
  - d. Semen Fructose
16. Histopathology deals with \_\_\_\_\_
  - a. **Diseased tissues**
  - b. Cells
  - c. Deceased tissues
  - d. Tissues
17. Hematology deals with \_\_\_\_\_
  - a. Urine
  - b. Sputum
  - c. Stool
  - d. **Blood**
18. Blood in urine is detected by \_\_\_\_\_ test
  - a. Benedict's
  - b. Fouchet's
  - c. **Benzidine**
  - d. Hay's
19. Wavelength range possible in colorimeter
  - a. **Visible light**
  - b. IR rays
  - c. Microwaves
  - d. UV rays



20. **The instrument used for preparing serum or plasma from blood**
  - a. Chemical Balance
  - b. Centrifuge
  - c. Water bath
  - d. Colorimeter
21. **Weight of NaOH required for preparing 100 ml of 1M NaOH solution.**
  - a. 40 mg
  - b. 4 g
  - c. 40 g
  - d. 4 mg
22. **Chemicals whose purity is guaranteed belong to \_\_\_\_\_ grade**
  - a. AR
  - b. GR
  - c. LR
  - d. Pure
23. **Normal value of FBS**
  - a. 60 – 160 mg%
  - b. 160 – 260 mg%
  - c. 70 – 110 mg%
  - d. 90 – 140 mg%
24. **A method for Hb estimation.**
  - a. Benedict's Test
  - b. DNS Method
  - c. Biuret Method
  - d. Sahli's Method
25. **A time-based assay**
  - a. End point assay
  - b. Quantitative assay
  - c. Qualitative assay
  - d. Kinetic assay
26. **Functioning of kidneys is assessed by \_\_\_\_\_**
  - a. RFT
  - b. TFT
  - c. LFT
  - d. GTT
27. **Identify the good cholesterol**
  - a. LDL
  - b. HDL
  - c. VLDL
  - d. TG
28. **Solution used for cleaning glass ware**
  - a. Copper sulphate
  - b. Permanganate
  - c. Dichromate
  - d. Sulphate
29. **Donor RBC is used for \_\_\_\_\_ cross matching**
  - a. Major
  - b. Minor
  - c. Forward
  - d. Reverse
30. **An exclusive specimen for microbiology**
  - a. Urine
  - b. Blood
  - c. CSF
  - d. Mid-stream Urine
31. **Identify the Non-Transaminase**
  - a. AST
  - b. ALP
  - c. ALT
  - d. SGPT
32. **A test used to diagnose gestational diabetes**
  - a. GTT
  - b. ALP
  - c. GGT
  - d. AST
33. **Shapeless bacteria are called \_\_\_\_\_**
  - a. Cocci
  - b. Vibrio
  - c. Bacilli
  - d. Mycoplasma
34. **Microbes requiring living cells for their growth**
  - a. Viruses
  - b. Bacteria
  - c. Fungi
  - d. Algae
35. **Moist Heat Sterilization includes \_\_\_\_\_**
  - a. Flaming
  - b. Hot air oven
  - c. Incineration
  - d. Autoclave
36. **Hot Sterilization is done by \_\_\_\_\_**
  - a. Hot water
  - b. Ionizing radiations
  - c. Non-ionizing radiations
  - d. Flame
37. **Medium used for doing Antibiotic Sensitivity Test**
  - a. MHA
  - b. SDA
  - c. Chocolate agar
  - d. EMB
38. **Culture method commonly used for isolating bacteria.**
  - a. Stroke culture
  - b. Streak Culture
  - c. Stab Culture
  - d. Lawn Culture
39. **Select the Counter stain in Gram staining**
  - a. Crystal Violet
  - b. Grams Iodine
  - c. Dilute Carbol fuchsin
  - d. Acetone
40. **Biochemical test giving no colour reaction.**
  - a. TSI test
  - b. Urease test
  - c. Citrate test
  - d. Catalase test

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