St. Philomena's College (Autonomous), Mysore			
PG Department of Biochemistry			
Question Bank (Revised Curriculum 2020-21 onwards)			
First Year- First Semester (2020-21 Batch)			
Course Title (Paper Title): Techniques in Biochemistry (HC) QP Code - 84121			
Sl. No	**Unit**	**Questions**	**Marks**
1	1	Give the significance of animal usage in research with examples.	2
2	1	Which are the different types of animal studies? Give their significance.	2
3	1	What are auxotrophs? Give example.	2
4	1	What is micropropogation? Give its significance.	2
5	1	What are adherent cells and suspension cells?	2
6	1	What is sub culturing of cells? Give its significance.	2
7	1	What are continuous and finite cell lines?	2
8	1	What are the contributions of cell line studies in the field of medicine?	2
9	1	Which are the different types of cell disruption methods? Name them.	2
10	1	How cells are lysed using chemical methods?	2
11	1	What is Ultrafilteration? Explain.	2
12	1	What is Dialysis? Explain.	2
13	1	What is freeze thaw? Explain	2
14	1	How is microwave used to cause lysis of cells?	2
15	1	What is osmotic shock? How is it used to cause cell lysis?	2
16	1	What is an homogenizer used for? Give its principle.	2
17	1	What is sonication? Give its significance.	2

18	1	What is French Press? Give its significance.	2
19	1	What is bead beating? Give its significance.	2
20	1	What are blenders used for? Give its principle.	2
21	1	What are pestle and mortar used for? What is its principle?	2
22	1	Explain the use of enzymes to bring about cellular lysis with examples.	2
23	1	Give the construction of Analytical Ultracentrifuge.	2
24	1	What is centrifugation? Explain its principle.	2
25	1	What is sedimentation Velocity and Sedimentation Equilibrium?	2
26	1	Give the relationship between RCF and RPM.	2
27	1	Which are the different types of rotors? Explain.	2
28	1	What is Schlerian Optics?	2
29	1	What is Differential And Density Gradient Centrifugation?	2
30	1	What is centrifugal Eluriation?	2
31	1	Give the construction of Preparative Ultracentrifuge.	2
32	1	What are Marker Enzymes? Give their significance with examples.	2
33	2	What is Chromatography? Give its Principle?	2
34	2	Explain the Principle behind Paper Chromatography.	2
35	2	Give the Applications of Paper Chromatography.	2
36	2	Explain the Principle behind TLC.	2
37	2	Give the Applications of TLC.	2
38	2	Explain the Principle behind Ion Exchange Chromatography.	2

39	2	Give the Applications of Ion Exchange Chromatography.	2
40	2	Explain the Principle behind Gel Filtration Chromatography.	2
41	2	Give the Applications of Gel Filtration Chromatography.	2
42	2	Explain the Principle behind Affinity chromatography.	2
43	2	Give the Applications of Affinity chromatography.	2
44	2	Explain the Principle behind GLC.	2
45	2	Give the Applications of GLC.	2
46	2	Explain the Principle behind HPLC.	2
47	2	Give the Applications of HPLC.	2
48	2	Explain the Principle behind FPLC.	2
49	2	Give the Applications of FPLC.	2
50	2	Explain the Principle behind Chromatofocusing.	2
51	2	Give the Applications of Chromatofocusing.	2
52	2	Explain the principle behind Electrophoresis with an example.	2
53	2	Explain the principle behind PAGE with an example.	2
54	2	Explain the principle behind SDS-PAGE with an example. Give its types.	2
55	2	What is the principle behind 2D electrophoresis?	2
56	2	Explain the principle behind Agarose Gel electrophoresis with an example.	2
57	2	Explain the principle behind Isoelectric focusing.	2
58	2	Explain the principle behind Pulsed Field Electrophoresis.	2
59	2	Explain the principle behind High Voltage Electrophoresis.	2

60	2	Explain the principle behind Capillary Electrophoresis.	2
61	2	What is blotting? Give its types.	2
62	2	What is Dot blot? Give its application.	2
63	2	What is Western blotting? Give its application.	2
64	2	What is Southern blotting? Give its application.	2
65	2	What is Northern blotting? Give its application.	2
66	2	What is Eastern blotting? Give its application.	2
67	2	What is the principle behind DNA finger print assay?	2
68	2	What is the principle behind DNA foot print assay?	2
69	2	What is the principle behind Gel retardation assay?	2
70	2	What is the principle behind Nuclease protection assay?	2
71	2	Explain Ethidium bromide as an visualizing agent	2
72	2	What is the principle behind Silver staining?	2
73	2	What is the principle behind PAS staining?	2
74	2	What is zymography? Give its types and applications.	2
75	3	What is spectroscopy? Give its types with their significance.	2
76	3	Give the principle and applications of Colorimeter.	2
77	3	Distinguish between FRET and FRAP.	2
78	3	What is Fluorescence spectroscopy? Give its applications.	2
79	3	Write the principle of flow cytometry with its applications.	2
80	4	What is Radioactivity? What is Bequerel?	2

81	4	What are radioIsotopes and isobars? Give examples.	2
82	4	What are Radio Isotopes and Heavy Isotopes? Give examples.	2
83	4	What is positron (Beta+) emission?	2
84	4	What is Negatron (Beta-) emission?	2
85	4	What is α particle emission?	2
86	4	What is gamma ray emission?	2
87	4	What is X ray emission?	2
88	4	Explain the principle behind Mass spectrometry. Give its applications.	2
89	4	Give the construction of Mass Spectrometer.	2
90	4	What is Electron impact ionization	2
91	4	What is Electron spray ionization?	2
92	4	What is Chemical ionization?	2
93	4	What is Atmospheric pressure chemical ionization?	2
94	4	What is Fast atom bombardment?	2
95	4	What is MALDI?	2
96	4	What are Photomultipliers?	2
97	4	What is Quadrupole mass analyser?	2
98	4	What is Time-of-Flight?	2
99	4	What is Fragmentation of ions? Give its types?	2
100	4	What is Electron multiplier?	2
101	4	What is Faraday Cup?	2

102	5	What is half life? Give its equation.	2
103	5	What is Decay Constant?	2
104	5	What is Specific Activity?	2
105	5	What are carrier free isotopes?	2
106	5	What is Autoradiography?	2
107	5	Give the Principles and applications of light microscopy.	2
108	5	Give the Principles and applications of phase contrast microscopy.	2
109	5	Give the Principles and applications of fluorescence microscopy.	2
110	5	Give the Principles and applications of confocal microscopy.	2
111	5	Give the Principles and applications of differential microscopy.	2
112	5	Give the Principles and applications of electron microscopy.	2
1	1	Explain different Types Of Studies in animal research. Add a note on achievements in the field of medicine with animal studies.	5
2	1	Explain Animal cells as research models.	5
3	1	Explain Plant cells as research models.	5
4	1	Explain different types of cell fractionation techniques.	5
5	1	Construction and applications of Analytical Ultracentrifuge	5
6	1	Construction and applications of Preparative Ultra Centrifuge	5
7	1	Write the working principle and Applications of Paper Chromatography.	5
8	2	Write the working principle and Applications of TLC.	5
9	2	Write the working principle and Applications of Ion Exchange Chromatography.	5

10	2	Write the working principle and Applications of Gel Filtration Chromatography.	5
11	2	Write the working principle and Applications of Affinity chromatography.	5
12	2	Write the working principle and Applications of GLC.	5
13	2	Write the working principle and Applications of HPLC.	5
14	2	Write the working principle and Applications of FPLC.	5
15	2	Write the working principle and Applications of Chromatofocusing.	5
16	2	Write the working principle and applications of 2D-Electrophoresis.	5
17	2	Write the working principle and applications of Isoelectric Focusing.	5
18	2	Write the working principle and applications of Pulsed Field Electrophoresis.	5
19	2	Write the working principle and applications of High Voltage Electrophoresis.	5
20	2	Write the working principle and applications of Capillary Electrophoresis.	5
21	2	Give a detailed account on Dot blot.	5
22	2	Give a detailed account on Western blotting.	5
23	2	Give a detailed account on Southern blotting.	5
24	2	Give a detailed account on Northern blotting .	5
25	2	Give a detailed account on DNA finger print assay.	5
26	2	Give a detailed account on DNA foot print assay.	5
27	2	Give a detailed account on Gel retardation assay.	5
28	2	Give a detailed account on Nuclease protection assay.	5

29	2	Comment on Ethidium Bromide, PAS Staining usage in visualizing electrophoresis gels.	5
30	2	Comment on Coomassie Blue stain, Silver Staining usage in visualizing electrophorised gels.	5
31	2	What is Zymography? Explain its types with applications.	5
32	2	Explain the construction, Principle and Applications of colorimeter with a neat labelled diagram.	5
33	3	Give the Principle and applications of FRET.	5
34	4	Give the Principle and applications of FRAP.	5
35	4	With a neat labelled diagram explain the principle, construction and applications of flow cytometry.	5
36	4	Explain the different types of Ionizers used in Mass Spectrometry.	5
37	4	Give the principle, construction and applications of Mass spectrometry with a neat labelled diagram.	5
38	4	Write the principle behind Mass Spectrometry. Add a note on the different types of detectors used in it.	5
39	5	Give the applications of radioisotopes in biology.	5
40	5	Write the principle and applications of Geiger Muller counter.	5
41	5	Write the principle and applications of Solid scintillation counter.	5
42	5	Write the principle and applications of liquid scintillation counter.	5
43	5	Comment on carbon dating.	5
44	5	Explain isotope dilution technique.	5
45	5	Give an account on Pulse Chase Experiment.	5
46	5	How are Proteins and Lipids radiolabelled? Explain.	5

47	5	How are Nucleic acids and Lipids radiolabelled? Explain.	5
48	5	Give the Principles and applications of light microscopy.	5
49	5	Give the Principles and applications of phase contrast microscopy.	5
50	5	Give the Principles and applications of fluorescence microscopy.	5
51	5	Give the Principles and applications of confocal microscopy.	5
52	5	Give the Principles and applications of differential microscopy.	5
53	5	Give the Principles and applications of electron microscopy.	5
54	5	Comment on the Resolving powers of various microscopes.	5
55	5	Comment on the Staining techniques for various microscopes.	5
1	1	Which are the different classes of animal research? Add a lime light on the benefits of animal models in research with examples, alternatives and the ethics to be taken care of.	10
2	1	Give a detailed account on the cell fractionation techniques.	10
3	1	Give the principles behind centrifugation. Explain the construction and applications of Analytical ultracentrifuge with a neat labelled diagram.	10
4	1	Give the principles behind centrifugation. Explain the construction and applications of preparative ultracentrifuge with a neat labelled diagram.	10
5	1	Explain the principle, working and applications of different types of paper chromatography with a neat labelled diagram.	10
6	2	Explain the principle, working and applications of TLC with a neat labelled diagram.	10
7	2	Explain the principle, working and applications of ion exchange chromatography with a neat labelled diagram.	10

8	2	Explain the principle, working and applications of gel filtration chromatography with a neat labelled diagram.	10
9	2	Explain the principle, working and applications of affinity chromatography with a neat labelled diagram.	10
10	2	Explain the principle, working and applications of gas chromatography with a neat labelled diagram.	10
11	2	Explain the principle, working and applications of HPLC with a neat labelled diagram.	10
12	2	Explain the principle and applications of FPLC and chromatofocusing with a neat labelled diagram.	10
13	2	Explain the principle and applications of 2D electrophoresis and capillary electrophoresis.	10
14	2	Explain the principle and applications of isoelectric focussing and high voltage electrophoresis.	10
15	2	Explain the principle and applications of 2D electrophoresis and pulsed field electrophoresis.	10
16	2	Give a detailed account on separation of proteins using electrophoresis with suitable visualization technique.	10
17	2	Give a detailed account on separation of lipoproteins using electrophoresis with suitable visualization technique.	10
18	2	Give a detailed account on separation of nucleic acids using electrophoresis with suitable visualization technique.	10
19	2	Explain the principle, Advantages, disadvantages and applications of Dot blot, Western, Southern, Northern and Eastern blotting.	10
20	2	Explain in detail the working procedure of Western blotting with its applications and limitations.	10

21	2	Give a detailed account on the working procedure of Southern blotting with its applications and limitations.	10
22	2	Give a detailed account on the working procedure of Dot blot with its applications and limitations.	10
23	2	Which are the different types of dyes used in visualizing the gel followed by electrophoresis? Give the principle behind them with their applications.	10
24	2	Give a detailed account on FRET and FRAP and their applications.	10
25	3	Comment on the Principle, Construction, Procedure and applications of Flow cytometry.	10
26	3	With a neat lablled diagram, give the construction, Principle, Applications and theory of Mass Spectrometry.	10
27	4	Give the construction, Principle, Applications and theory of Mass Spectrometry with a labelled diagram.	10
28	4	How radioactivity is detected using Geiger Muller counter and Scintillation counters. Explain.	10
29	5	Give an account on radiolabelling of Proteins, Lipids and Nucleic acids.	10
30	5	Explain the Principles and applications of light microscopy, phase contrast microscopy.	10
31	5	Explain the Principles and applications of fluorescence microscopy, confocal microscopy, differential microscopy, electron microscopy.	10
32	5	Explain the Principles and applications of fluorescence microscopy, confocal microscopy, differential microscopy, electron microscopy.	10

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St. Philomena's College (Autonomous), Mysore			
II Semester M.Sc-Final Examination: Model Question Paper			
Subject: Biochemistry			
Title: Techniques in Biochemistry			
Time: 3 Hours			**Max Marks : 70**
PART-A			
Answer any TEN of the following:			**10x2=20**
1.		Explain beer lamberts' law.	**2**
2.		How can we visualize the separated components on a Gel? Explain with an example.	**2**
3.		What are stokes and antistokes shift?	**2**
4.		What is an auxochrome? Give examples.	**2**
5.		Define spectroscopy. Give its types.	**2**
6.		What is Blotting? Give its types with significance.	**2**
7.		Give the principle behind FRAP.	**2**
8.		What is sedimentation rate?	**2**
9.		What are auxotrophs?	**2**
10.		Differentiate between salting in and salting out.	**2**
11.		Write the principle behind affinity chromatography.	**2**
12.		Which are the different types of paper chromatography? Explain its principle.	**2**
PART-B			
Answer any SIX questions:			**6x5=30**
13.		Give the construction and applications of colorimeter.	**5**
14.		What is Zymography? Explain its types and applications.	**5**
15.		Briefly comment on DNA foot printing.	**5**

16.		Explain Gel retardation assay with its application.	**5**
17.		Write the principle and procedure for silver staining.	**5**
18.		Give a detailed account on FRET and its applications.	**5**
19.		Give a detailed account on plant and animal cell cultures as models.	**5**
20.		Which are the different types of animal studies? Explain.	**5**
		PART-C	
Answer any TWO questions:			**2x10=20**
21.		Give the principle, construction and applications of Mass Spectroscopy. Explain any one ion source, analyzer and a detector.	**10**
22.		Explain Western and Dot blots.	**10**
23.		Comment on the working principle, procedure and applications of Gas Chromatography.	**10**