Title

O-Level Topical Biology (PAPER-2 Theory)

(2018-2025)

Updated Syllabus (2025-2026-2027)

Published by

Rabbani Publications Center

Rabbani Photo Copier

Arranged & Designed by

Muhammad Majid Hussain

Legal Advisor

Ch. Muhammad Naseer (Kakuana)
Advocate Hight Court
0300-7658213
Chamber # 26, Randhawa Law Building
Near CPO office Distt. Katchery, Faisalabad.

Mian Zahid Iqbal
Advocate Hight Court
0321-7618063
Chamber # 26, Randhawa Law Building
Near CPO office Distt. Katchery, Faisalabad.

For Complaints/Order

Rabbani Publications
36-Z, Commercial Center, Near Mujahid Hospital, Madina Town, Faisalabad.
0332-6682372, 0300-4537372
(rabanipublications@gmail.com)

Rabbani Photo Copier
Corner Jamia Masjid Technical, D-Ground Faisalabad.
0300-6682372
(rabaniphotostate@gmail.com)

Price

PREFACE

IN THE NAME OF ALLAH, MOST GRACIOUS AND MOST MERCIFUL.

Biology is a fascinating subject that helps us explore the wonders of life - from the tiniest cell to the most complex ecosystems. Understanding this subject not only strengthens scientific thinking but also inspires curiosity about the world around us.

This book, O Level Biology (5090) Topical Unsolved Past Papers with Mark Scheme, has been carefully designed to help students practice and master every topic of the updated syllabus (2025–2027). Each question has been organized sub topic by sub topic, enabling learners to focus on one concept at a time and build confidence step by step.

To further support preparation, all variants have been included along with detailed mark schemes. This approach allows students to understand how examiners award marks and how to present answers effectively in the actual examination.

We hope this book will serve as a reliable study companion for both teachers and students. Consistent practice, clear concepts, and self-assessment through this resource will surely lead to success in the Cambridge O Level Biology examination, Insha'Allah.

Wishing you all the best in your learning journey and future achievements!

Rabbani Publications

Special Thanks To
Team Coordinator
Sir Anzar Ahmad
(MSc Chemistry)

in case of any suggestion for improvement Team Head can be contacted at
Cell: 0332-6682372 / Email: rabanipublications@gmail.com

COPY RIGHTS RESERVED.

All rights reserved. Apart from any use permitted under PAK copyright law, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or held within any information storage and retrieval system, without permission in writing from the publisher or under licence from the Copyright Licensing Agency Limited. Further details of such licences (for reprographic reproduction) may be obtained from the Copyright Licensing Agency.

Printed in Faisalabad-Pakistan.

Quality Policy

- Customer satisfaction is our priority and achieve this goal we will always, work as a team.
- Produce and supply finest quality goods meeting all the specification including Environmental concern and safety
- Every employee will influence to contribute towards
- Quality improvement to sustain through ideas and innovation.

- گاہک کا اطمینان ہماری اولین ترجیح ہے۔
- اپنے مقصد کے حصول کیلئے ہم ہمیشہ بحیثیت ایک ٹیم کام کرتے ہیں۔
- گاہک کی ضروریات اور ماحولیاتی حالات اور احتیاطی تدابیر کہ مدنظر رکھتے ہوئے معیاری اشیاء فراہم کرتے ہیں۔
- ہر فرد اپنے خیالات اور تخلیقات کے ذریعے بہتر کوالٹی اور اس کو برقرار رکھنے کیلئے موثر کردار ادا کرتا ہے۔

CONTENTS

T. No.	TOPIC	Page No.
1	**Cell**	
1.1	Cell Structure and Function	01
	(Marking Scheme)	13
2	**Classification**	
2.1	Concept and use of a classification system	17
	(Marking Scheme)	21
2.2	feature of organism	23
	(Marking Scheme)	32
3	**Movement into and out of cells**	
3.1	Diffusion and osmosis	36
	(Marking Scheme)	40
3.2	Active transport	42
	(Marking Scheme)	44
4	**Biological Molecules**	
4.1	Biological Molecules	45
	(Marking Scheme)	52
5	**Enzymes**	
5.1	Enzyme actions	55
	(Marking Scheme)	68
5.2	Effects of temperature and pH	73
	(Marking Scheme)	74
6	**Plant nutrition**	
6.1	Photosynthesis	75
	(Marking Scheme)	89
6.2	Leaf structure	94
	(Marking Scheme)	103
6.3	Mineral nutrition	107
	(Marking Scheme)	114

CONTENTS

T. No.	TOPIC	Page No.
7	**Transport in flowering plants**	
7.1	Uptake and transport of water and ions	117
	(Marking Scheme)	122
7.2	transpiration and translocation	124
	(Marking Scheme)	136
8	**Human nutrition**	
8.1	Diet	142
	(Marking Scheme)	156
8.2	Human digestive system	162
	(Marking Scheme)	192
8.3	Absorption and assimilation	206
	(Marking Scheme)	207
9	**Human gas exchange**	
9.1	Human Gas Exchange	208
	(Marking Scheme)	230
10	**Respiration**	
10.1	Respiration	239
	(Marking Scheme)	244
10.2	Aerobic respiration	246
	(Marking Scheme)	248
10.3	Anaerobic Respiration	250
	(Marking Scheme)	253
11	**Transport in Humans**	
11.1	Circulatory System	255
	(Marking Scheme)	257
11.2	Heart	258
	(Marking Scheme)	268
11.3	Blood vessels	274
	(Marking Scheme)	282
11.4	Blood	285
	(Marking Scheme)	293

CONTENTS

T. No.	TOPIC	Page No.
12	**Disease and Immunity**	
12.1	Disease	297
	(Marking Scheme)	315
12.2	Antibiotics	321
	(Marking Scheme)	328
12.3	Immunity	331
	(Marking Scheme)	338
13	**Excretion**	
13.1	Excretion	341
	(Marking Scheme)	344
13.2	Urinary System	346
	(Marking Scheme)	353
14	**Coordination and control**	
14.1	Mammalian Nervous System	355
	(Marking Scheme)	372
14.2	Mammalian sense organs	379
	(Marking Scheme)	391
14.3	Mammalian Hormones	396
	(Marking Scheme)	402
14.4	Homeostasis	405
	(Marking Scheme)	408
14.5	Temperature Control	409
	(Marking Scheme)	415
14.6	Blood glucose control	419
	(Marking Scheme)	425
15	**coordination and Response in Plants**	
15.1	Coordination and response in plants	427
	(Marking Scheme)	431
16	**Development of organisms and continuity of life**	
16.1	Nuclear division	433
	(Marking Scheme)	436

T. No.	TOPIC	Page No.
16.2	Asexual and sexual reproduction	438
	(Marking Scheme)	441
16.3	Sexual reproduction in plants	442
	(Marking Scheme)	485
16.4	sexual reproduction of humans	498
	(Marking Scheme)	510
17	**Inheritance**	
17.1	Variation	514
	(Marking Scheme)	517
17.2	DNA	518
	(Marking Scheme)	522
17.3	Inheritance	524
	(Marking Scheme)	544
17.4	Selection	551
	(Marking Scheme)	560
18	**Biotechnology and genetic modification**	
18.1	Biotechnology	562
	(Marking Scheme)	577
18.2	Genetic Modification	583
	(Marking Scheme)	587
19	**Relationship of organisms with one another and with the environment**	
19.1	Energy Flow	589
	(Marking Scheme)	602
19.2	Nutrient cycles	606
	(Marking Scheme)	614
19.3	Ecosystem and Biodiversity	617
	(Marking Scheme)	624
19.4	Effects of Humans on Ecosystems	628
	(Marking Scheme)	660
19.5	Conservation	672
	(Marking Scheme)	677

Q5/21/O/N/18

1 Fig. 1 shows cells from a plant tissue which have been mounted on a slide with distilled water and viewed using a microscope.

Fig. 1

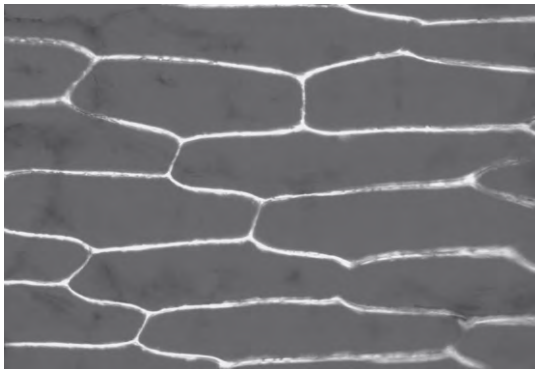
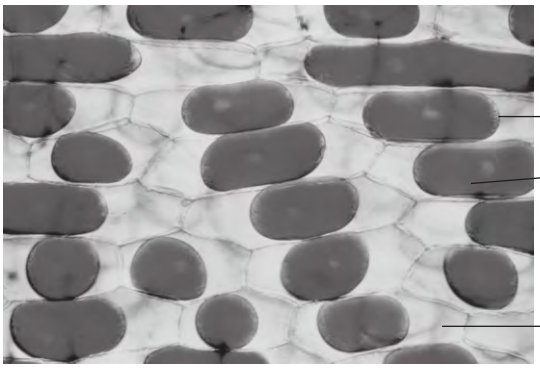


Fig. 2 shows cells taken from the same plant tissue when mounted on a slide with concentrated salt solution.

Fig. 2



(a) Explain the appearance of the cells in Fig. 2.

.....

.....

.....

.....

.....

..... [4]

(b) (i) Identify structures **P** and **Q** in Fig. 2.

P .....

Q ..... [2]

(ii) State the contents of location **R** in Fig. 2.

..... [1]

RABBANI BROTHERS & SON's

(iii) The concentrations of substances in structure **Q** are different from those in location **R**.

Explain how the properties of structure **P** result in differences in concentrations of substances in **Q** and **R**.

.....

.....

.....

.....

..... [3]

Q9(b)/21/M/J/19

2 Describe and compare the following:

(b) viruses and bacteria.

.....

.....

.....

.....

.....

.....

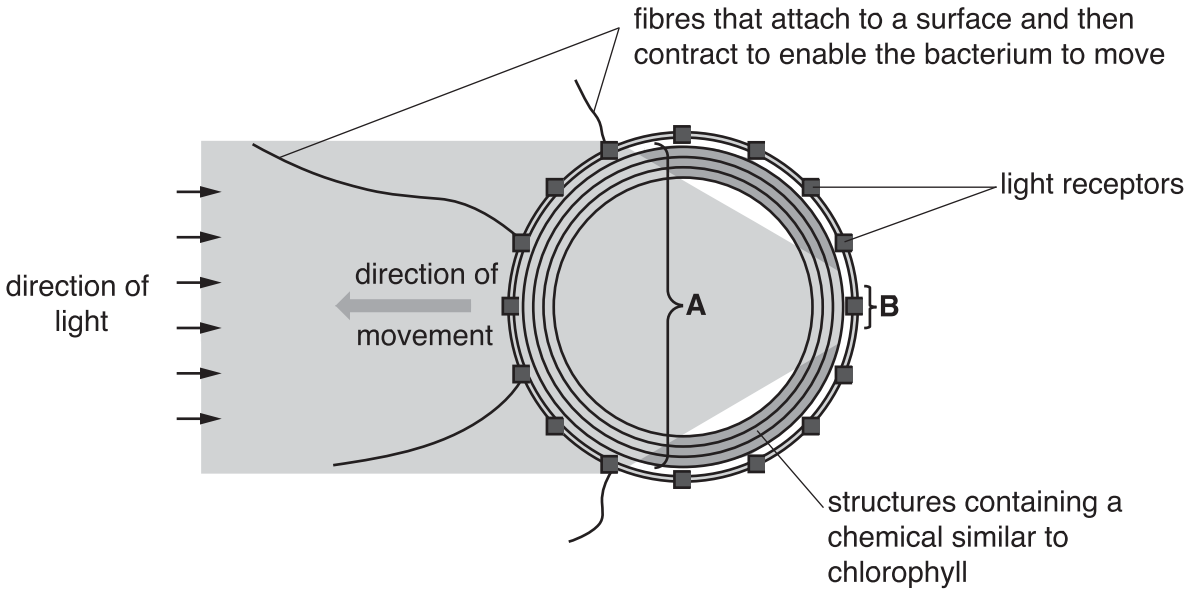
.....

..... [5]

RABBANI BROTHERS & SON's

Q2(a)/22/M/J/19

3 The diagram shows the structure of a type of bacterium and details of the response of the bacterium to light.



(a) Use information in the diagram to suggest:

(i) the sequence of events that takes place when the bacterium is provided with light from the direction shown

.....

.....

.....

.....

..... [3]

(ii) the advantage to the bacterium of responding to light in this way.

.....

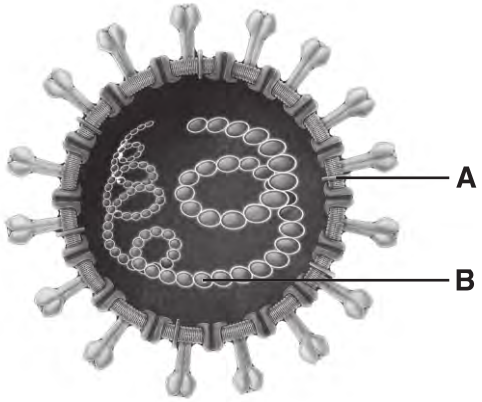
.....

..... [2]

RABBANI BROTHERS & SON's

Q2(c(ii),d)/21/O/N/19

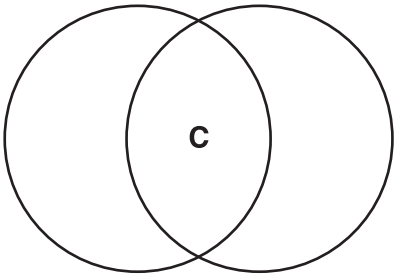
4 The diagram shows the structure of a virus.



(c) (ii) State **one** structural feature **absent** in a bacterial cell that is always present in a plant cell.

..... [1]

(d) The diagram shows how the structural features found in plant cells and in animal cells can be grouped together.



List **three** features that would be grouped in region **C** on the diagram.

1 .....

2 .....

3 .....

[3]

RABBANI BROTHERS & SON's

Q4(b(i)/21/O/N/21

5 The kapok tree is a flowering plant that grows rapidly to become one of the tallest trees in a tropical rainforest ecosystem. Climbing plants wind up its stem and the tree provides a habitat for insect-eating birds and frogs. Bats feed on the nectar from its flowers and pollinate them so they can produce small, light seeds. Insects feed on its leaves and when the leaves fall to the ground they will come into contact with soil bacteria and fungi.

(b) Every year large areas of tropical rainforest are destroyed by burning.
A large percentage of the mass of a kapok tree is made of the element carbon.

(i) Name **one** substance, found in plants but not in animals, that contains carbon.

..... [1]

Q6(a)/21/M/J/22

6 There are many different types of virus that can infect animal cells.

(a) Compare the **structure** of a typical virus with a typical animal cell.

.....

.....

.....

.....

.....

..... [4]

Q2(d(i)/21/O/N/22

7 **(d)** The skins of the grapes are naturally covered in a white powdery coating. This is wild yeast, a fungus.

(i) List **two** similarities in structure between grape cells and yeast cells.

1 .....

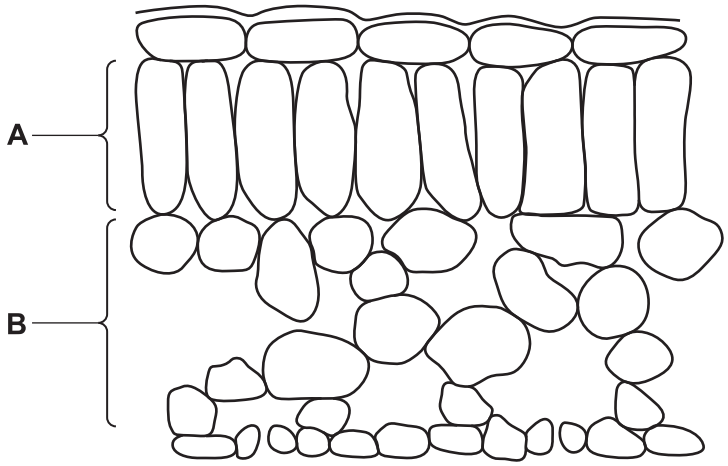
2 .....

[2]

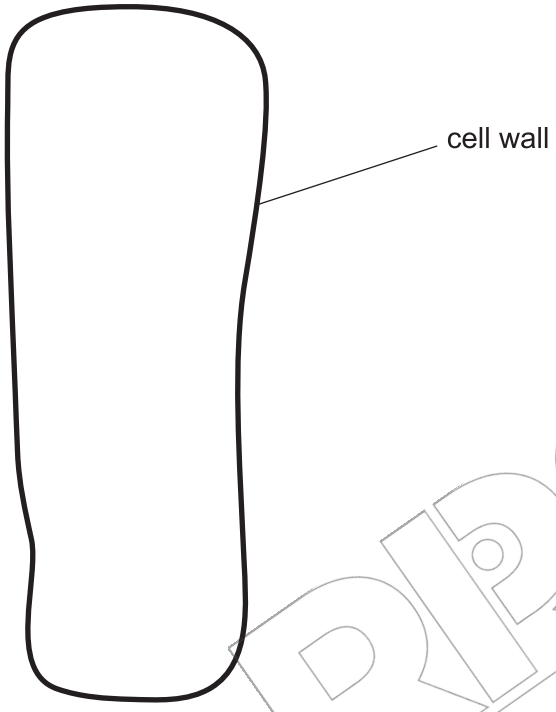
RABBANI BROTHERS & SON's

Q2(a(ii)/22/O/N/22

8 The diagram shows a cross-section through a leaf when viewed using a light microscope.



(ii) The diagram shows an enlargement of one cell from part **A** of the leaf cross-section.



Complete the diagram of the cell by drawing and labelling to show the position of

- **one** chloroplast
- **three** other types of **named** cell component that will be visible.

[4]

RABBANI BROTHERS & SON's

Q3(a)/21/M/J/23

9 Fig. 3.1 shows a young tomato plant growing near a window.
Cells from two positions in the stem are also shown.

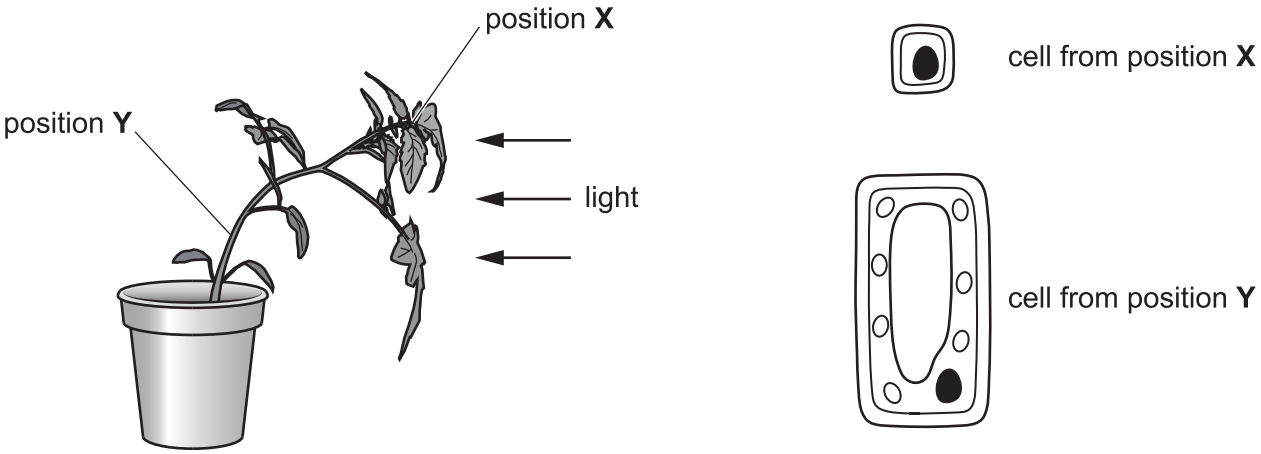


Fig. 3.1

The cells at **X** divide constantly. They then increase in size and some form mature cells like the one shown from position **Y**.

(a) Cells at positions **X** and **Y** differ in size and shape.
Give **two other** differences between these cells.

1 .....

.....

2 .....

.....

[2]

RABBANI BROTHERS & SON's