



14/2

October/November 20XX

Time: 2 Hours

**Mark answers by shading the oval heavily, like this: - **

CENTRE NUMBER						CANDIDATE NUMBER					
B	W										
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		2	2	2	2	2	2	2	2	2	2
		3	3	3	3	3	3	3	3	3	3
		4	4	4	4	4	4	4	4	4	4
		5	5	5	5	5	5	5	5	5	5
		6	6	6	6	6	6	6	6	6	6
		7	7	7	7	7	7	7	7	7	7
		8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9

1. Write your full names and examination number in the spaces provided above.
2. Answer **ALL** questions.
3. All answers must be written in the spaces provided.
4. Show **ALL** the necessary working.
5. Calculators may be used in this paper.
6. A copy of the Periodic Table is printed on page 20.

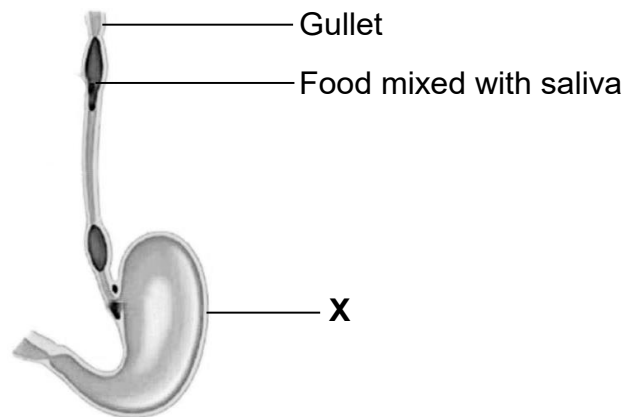
DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO



SECTION A

(60 Marks)

The diagram below shows part of the digestive system in which food is being pushed down the gullet into organ X. Use it to answer question 1.



1. (a) Name organ X.

..... (1)

- (b) Describe how the food is being pushed down the gullet.

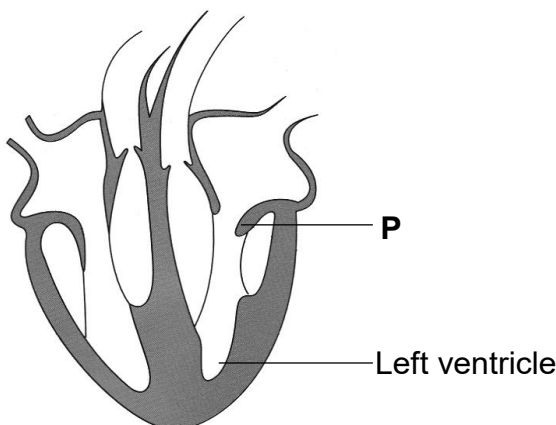
..... (1)

- (c) Suggest **two** reasons why food has to be mixed with saliva.

.....

..... (2)

The diagram below shows a section through the human heart. Use it to answer question 2.



2. (a) On the diagram, draw an arrow to show the direction of the flow of the blood:
- (i) into the heart from the lungs, (1)
- (ii) out of the heart to the body. (1)
- (b) (i) Name structure **P**.
..... (1)
- (ii) State how structure **P** shows that the left ventricle is relaxed.
..... (1)
- (c) State any **two** diseases of the human circulatory system.
.....
..... (2)

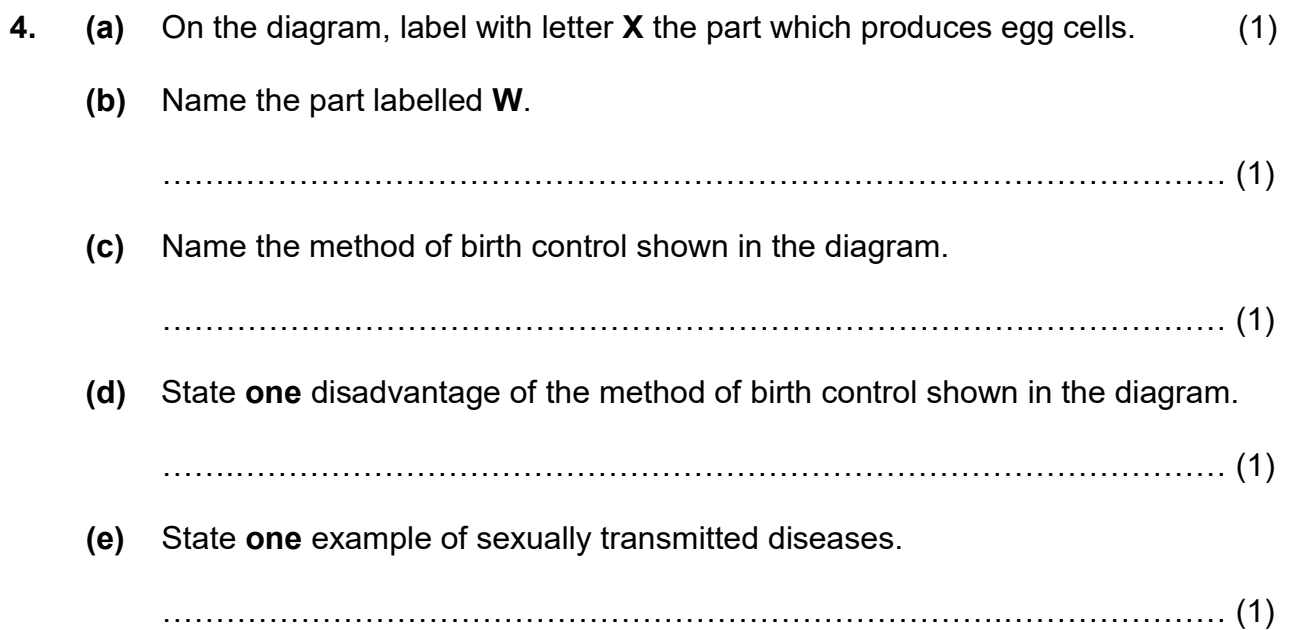
A student investigated food samples K, L, M and N for the presence of starch, glucose, fats and proteins. The results of the investigation are shown in the table below. Use it to answer question 3.

	Nutrients			
Food sample	Starch	Glucose	Fats	Proteins
K	Present	Absent	Present	Present
L	Absent	Present	Present	Absent
M	Absent	Absent	Absent	Present
N	Present	Present	Present	Absent

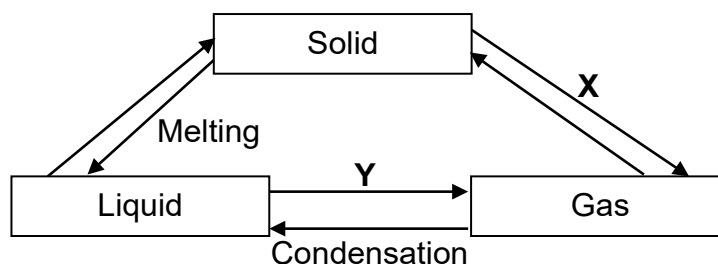
3. (a) Name the chemical substance used to test for the presence of glucose.
 (1)
- (b) State the food sample which has the least nutrients present.
 (1)
- (c) Suggest a food sample that will give most energy.
 (1)
- (d) Suggest how the results obtained in the table above will change when the enzyme amylase is added to food sample **K**.

 (2)
-

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
84



The diagram below shows changes of state of matter with some processes labelled X and Y. Use it to answer question 5.



5. (a) Name the processes represented by letters X and Y.

X

Y (2)

- (b) Explain changes in the arrangement of particles when a gas turns into a liquid.

.....

..... (2)

6. (a) Lithium, Boron, and Fluorine are elements found in the Periodic Table of Elements.

In which period are these elements found in the periodic table?

..... (1)

- (b) Describe the trend in the atomic size of the elements in the same period.

.....

..... (1)

- (c) State the group in which nitrogen is found in the periodic table.

..... (1)

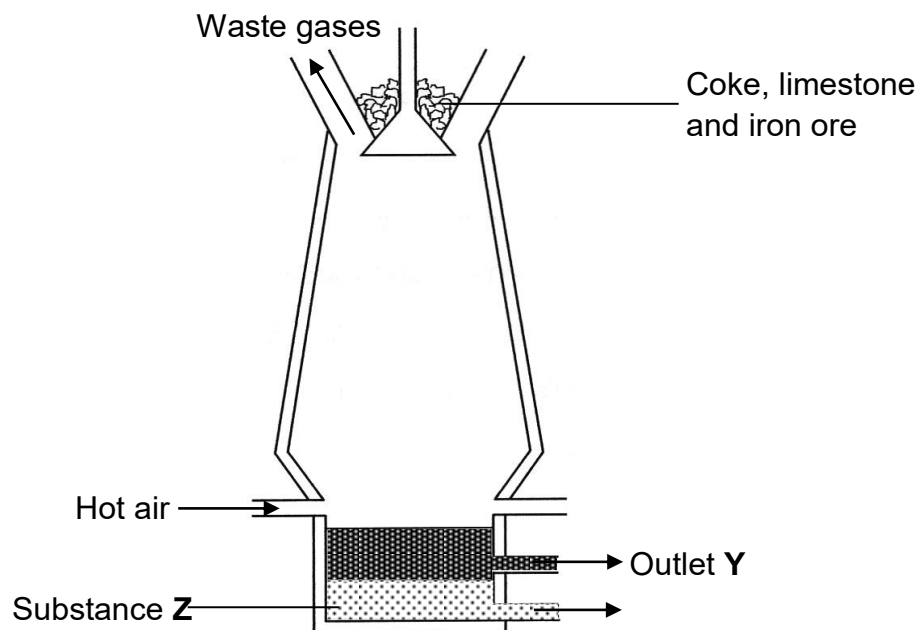
- (d) State **one** property of oxygen.

.....

..... (1)

Waste gases

Coke, limestone and iron ore

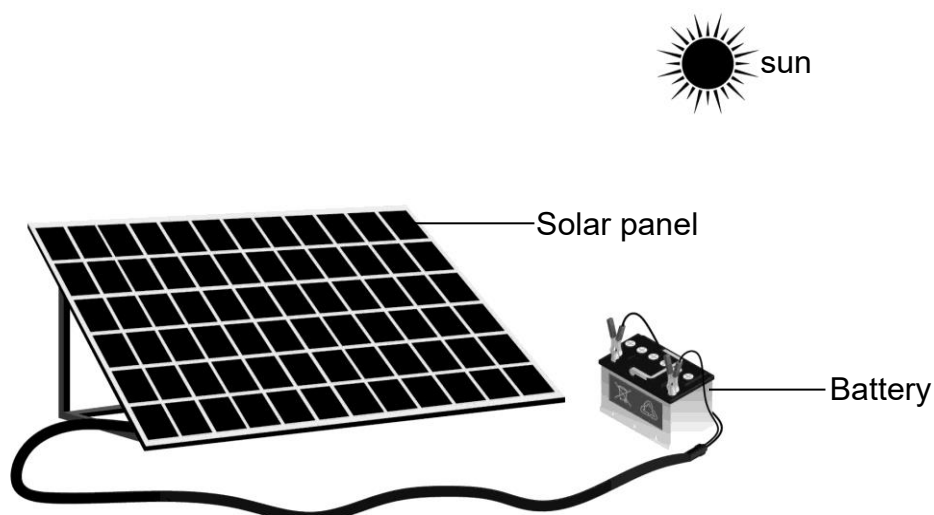


7. (a) Name the ore from which iron is extracted.
..... (1)
- (b) State the function of limestone in the blast furnace.
.....
..... (1)
- (c) Name the substance that is obtained at outlet Y.
..... (1)
- (d) Name substance Z.
..... (1)
- (e) In the blast furnace, the limestone (calcium carbonate) decomposes and produces two products.

calcium carbonate $\rightarrow$ + (2)

[illegible]

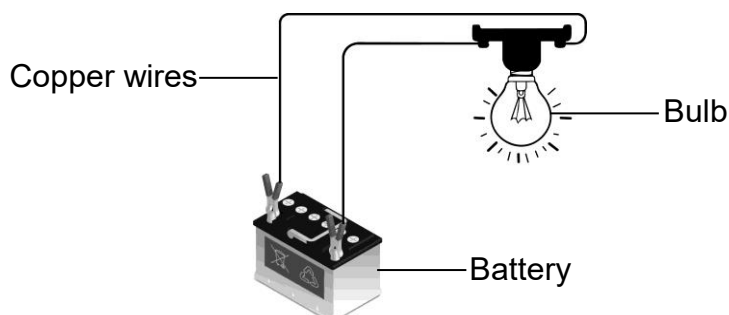
The diagram below shows a solar panel being used to harness solar energy to charge a battery. Use it to answer question 8.



8. (a) Explain why the solar panel is black in colour.

.....
 (1)

After the battery is fully charged, it is connected using copper wires to power a bulb as shown in the diagram below.



- (b) Complete the table below by writing the form of energy for each described case.

One box has been filled for you.

Case	Form of Energy
Energy given out by the bulb	Light
Energy transmitted within the copper wires	
Energy stored in the battery	

(2)

The bulb has a power rating of 1.2 kW. It is used to illuminate a room in order to conserve mains electricity.

- (c) (i) Calculate the mains electrical energy in kWh that the lamp would have used in 2 hours.

Electrical energy = kWh (2)

- (ii) Hence, calculate the money saved in 2 hours if the mains electricity costs P0.80 per kWh.

Money saved = P..... (2)

- (d) Explain how harnessing solar energy for power generation helps in reducing global warming.

.....
..... (2)

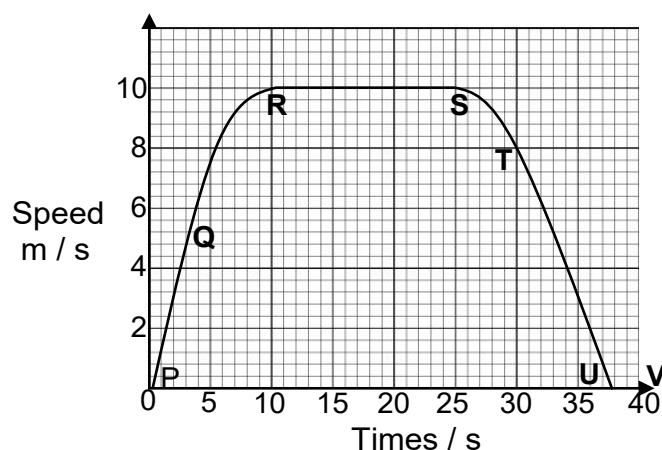


9. (a) An athlete takes 25 seconds to complete a 200 m race.

Calculate the average speed of the athlete.

Average speed = (2)

- (b) The diagram below shows the speed-time graph for the athlete.



- (i) Identify the section of the graph which shows that the athlete's speed is uniform. Circle the letters on the diagram between which this section lies. (1)

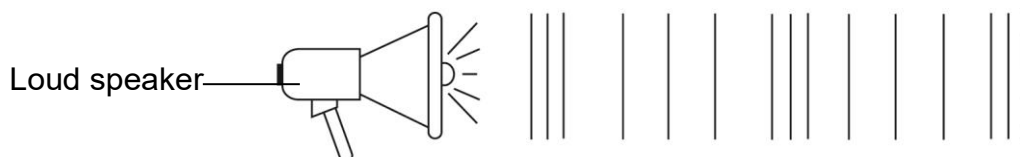
- (ii) Explain your answer to (b)(i) above.

.....
..... (2)

- (c) Define the term velocity.

.....
..... (1)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
84



10. (a) Draw a line on the diagram to show distance that represents the wavelength of the sound waves. Label the line with a letter **L**. (1)
- (b) The sound waves travelling in air eventually reach a wall. Some sound waves get reflected by the wall while some go straight through the wall.
- (i) State the name given to reflected sound. (1)
-
- (ii) Describe how the speed of sound within the wall compares with the speed of sound in air. (1)
-
-
- (c) Sound waves are classified as longitudinal waves.
- (i) State another class of waves. (1)
-
-
- (ii) Describe how this other class of waves differs from longitudinal waves. (1)
-
-

11. The diagram below shows a bowl of iron filings and a steel nail attracted to a magnet.



The steel nail was then detached from the magnet and held over the bowl containing iron filings as shown below.

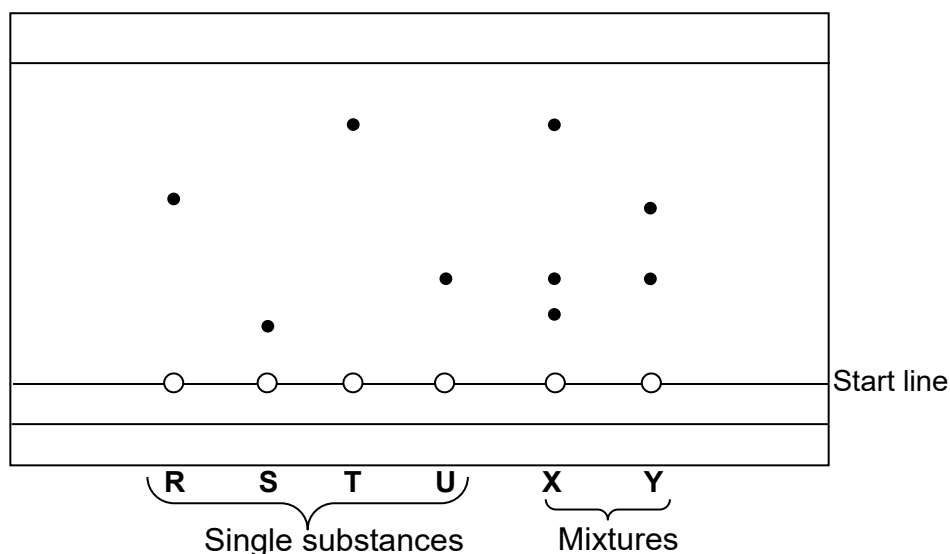


- (a) (i) State what will happen when the steel nail is held above the bowl of iron filings.
-
- (1)
- (ii) Name the phenomenon demonstrated in this experiment.
- (1)
- (b) (i) State what would happen, if the nail used in this experiment was made of iron.
-
- (1)
- (ii) Explain your answer in (b)(i).
-
- (1)
- (c) State **two** uses of iron that is based on its magnetic properties.
-
- (2)

SECTION B

(20 Marks)

The diagram below shows the results of a separation technique that was conducted to identify the components of mixtures X and Y. Each mixture contains one or more of the single substances labeled R, S, T and U. Use it to answer question 12.



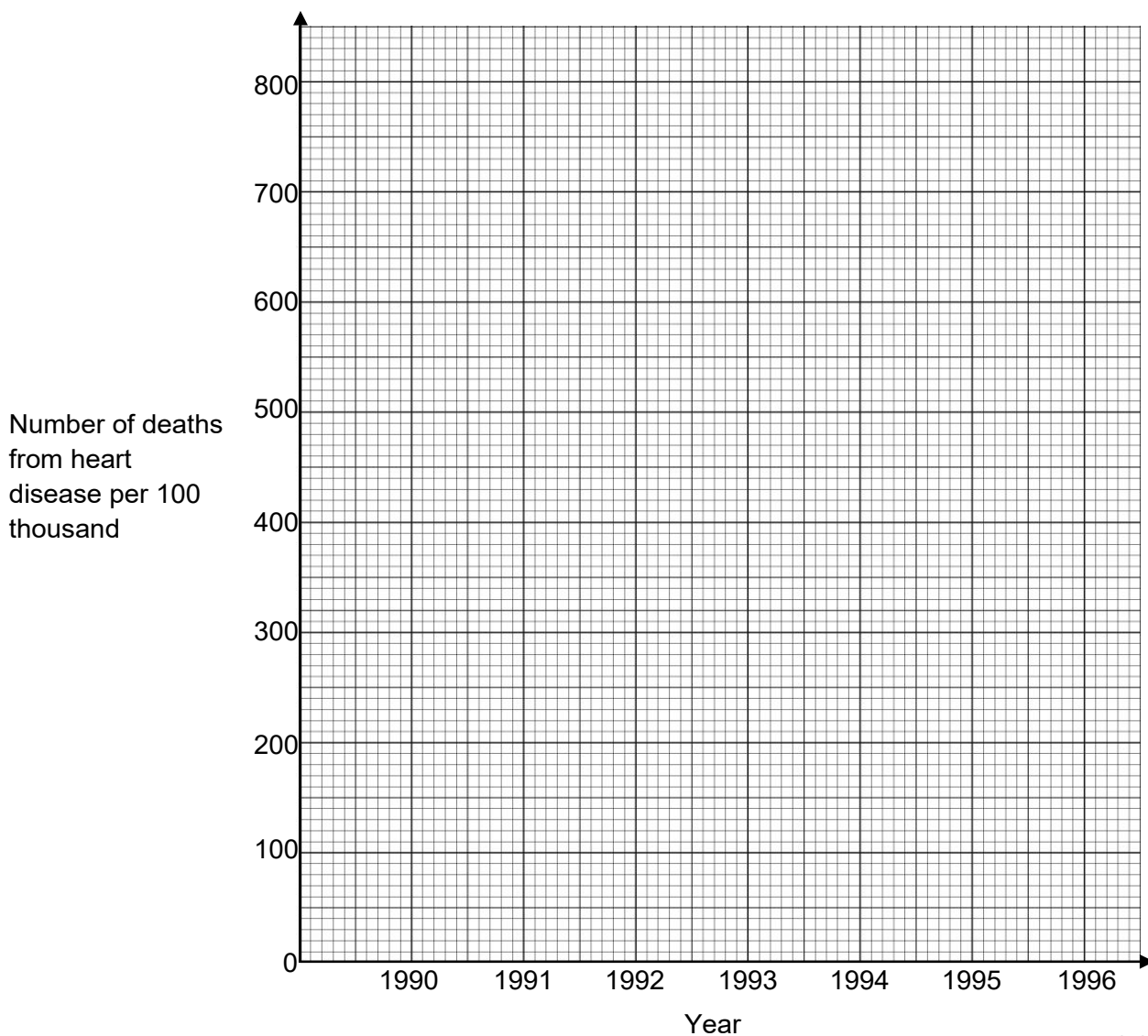
12. (a) Name the separation technique.
..... (1)
- (b) Explain why ink **cannot** be used to draw the starting line.
.....
..... (2)
- (c) From the diagram, state the
- (i) mixture which contains substance **R**,
..... (1)
- (ii) substance found in both mixture **X** and mixture **Y**.
..... (1)



The table below shows death in a certain country from heart disease between the years 1990 and 1996. Use it to answer question 13.

Year	1990	1991	1992	1993	1994	1995	1996
Number of deaths from heart disease per 100 thousand	100	300	660	700	800	720	510

13. (a) Plot a graph of number of deaths from heart disease against years.



(4)

- (b) (i) Describe the shape of the graph between the years 1994 and 1996.

.....
 (1)

.....

..... (2)

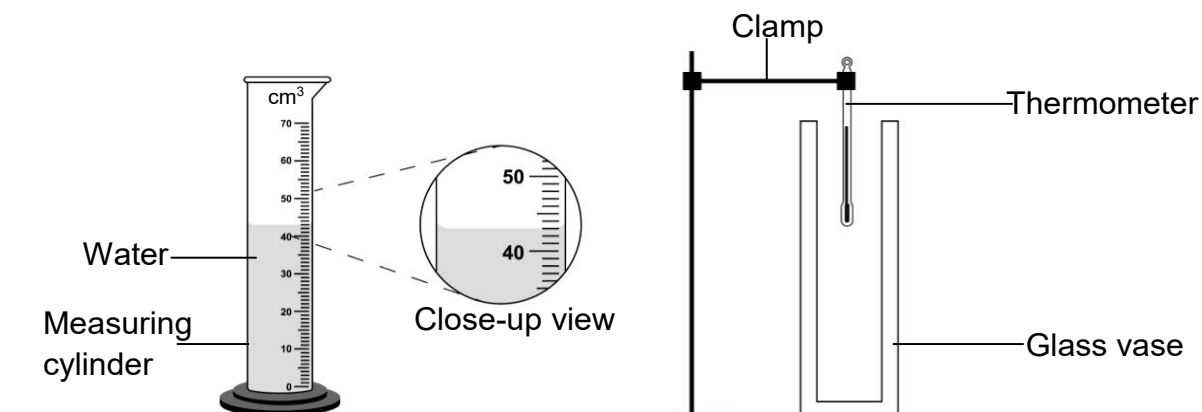
.....

..... (1)

Number of deaths difference = (2)

14. Some students wanted to determine the cross-sectional area of a transparent vase. The students were provided with a transparent vase, a ruler, and a measuring cylinder containing some water.

The diagram below shows the measuring cylinder containing the water.



- (a) (i) Record the volume, V , of the water in the measuring cylinder.

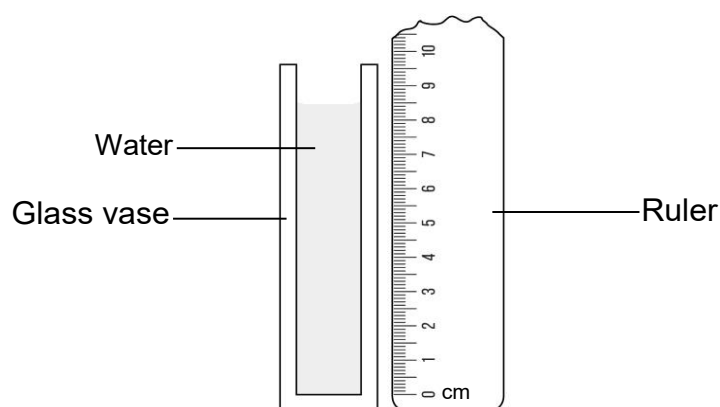
$V = \dots\dots\dots \text{cm}^3$ (1)

- (ii) State **one** way in which the students could ensure accurate measurement of volume with a measuring cylinder.

.....
 (1)

- (b) The students poured all the water from the measuring cylinder into the transparent vase.

They then measured the height, h , of the water in the transparent vase with a ruler as shown in the diagram below.



- (i) Record the height, h , of the water in the transparent vase.

height, $h = \dots\dots\dots \text{cm}$ (1)

- 11

BLANK PAGE

BLANK PAGE



DATA SHEET

The Periodic Table of the Elements

Group

*58-71 Lanthanoid series
†90-103 Actinoid series

a	a = relative atomic mass
X	X = atomic symbol
b	b = proton (atomic) number

Key

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).