Multiple-choice section

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 |
| Answer | D | A | C | B | B |

Question 1 [11.1]

D

4.5 = ,  = 6 =,  (repeating decimal) are all rational

Question 2 [11.1]

A

 is between  and , so  is between 4 and 5.

Question 3 [11.2]

C

 = 

= 2

Question 4 [11.2]

B

6 × 5 = 6 × 5 ×  × 

= 

Question 5 [11.3]

B

Adding like terms:

7 – 3 = 4

Multiple-choice total marks: / 5

Short answer section

Question 6 2 marks [11.1]

 is an example of a surd or an irrational number.

Question 7 3 marks [11.3]

 + 3

=  + 

= 2 + 3 × 5

= 2 + 15

= 17

Question 8 4 marks [11.4]

2(3 + )

= 2 × 3 + 2 × 

= 6**** + 2****

= 6 × 4 + 2

= 24 + 4****

Question 9 2 marks [11.2]

7 = **** × 

= ****

= ****

Question 10 3 marks [11.3]

*A* = πr2  
= π ×  ×   
= 4 × 3 × π  
= 12π mm2

Question 11 5 marks [11.5]

|  |  |
| --- | --- |
| (a)  = 5  = 5 | (b)  =  ×  =  = |

Short answer total marks: 19

Extended answer section

Question 12 8 marks [11.2, 11.3]

**(a)** *r* = ( + 2) cm  
*A* = π*r*2  
= π × ( + 2)2 cm2  
= π × (5 + 4 + 4) cm2  
= (9 + 4)π cm2

**(b)** Surface area of a cylinder with circular base as given in (a) and height of 6 cm.  
Curved surface length:  
*C* = 2π*r*  
= 2π( + 2) cm  
Area of curved surface:  
*A* = 2π( + 2) × 6 cm2  
= 12π( + 2) cm2  
SA = area of curved surface + 2 × area of base  
= 12π ( + 2) + 2 × (9 + 4) cm2  
= π(12 + 24 + 18 + 8) cm2  
= (20 + 42)π cm2

**(c)** Volume = area of base × height  
*V* = (9 + 4)π × 6 cm3  
= 6π(9 + 4) cm3

Question 13 8 marks [11.2, 11.3]

**(a)** Exact wall height= 2 × 20 + 2 × 100 cm  
=  + 200 cm

**(b)** Exact width of the wall  
= 2 × 20 + 2 × 200 cm  
= 40 + 400 cm

**(c)** *A* = (40 + 200)(40 + 400) cm2  
= 1600 × 3 + 16 000 + 8 000 + 80 000 cm2  
= 84 800 + 24 000 cm2

**(d)** *A* = 84 800 + 24 000 – π(20)2 cm2  
= 84 800 + 24 000 – 1200π cm2

= 122 599.308… cm2

= 12.26 m2 (2 d.p.)

Extended answer total marks: 16

TOTAL test marks: 40