Multiple-choice section

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Answer | B | D | C | B | A | C | A | C |

Question 1 [10.3]

**B**

There is no overlap with hearts and clubs ∴ mutually exclusive.

Question 2 [10.4]

D

Pr(HT) + Pr(TH) + Pr(TT)

= 0.24 + 0.24 + 0.16

= 0.64

Question 3 [10.5]

**C**

The previous spins have no impact on the third spin, so the probability is just .

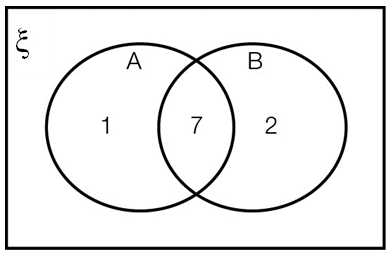
Question 4 [10.1]

**B**



Question 5 [10.2]

A



8 + 9 = 17, so the overlap is 7: 

Question 6 [10.5]

**C**

The first card not being a heart means we still have 13 hearts in the 51 cards.

Question 7 [10.6]

**A**

There are 36 outcomes. Only (1, 1) gives a total of 2. So, Pr(total of 2) = .



Question 8 [10.3]

**C**

Pr(2 or club) = = =



Multiple-choice total marks: 8

Short answer section

Question 9 2 marks [10.2]

**(a)** Two events that cannot occur at the same time are said to be *mutually exclusive*.

**(b)** A *Venn diagram* consists of a rectangle with one or more circles inside it where the rectangle represents the universal set.

Question 10 1 mark [10.4]

A conditional statement is one where you are given additional information about what has occurred. As an example, you might draw two cards, without replacement, from a normal pack of 52 cards and know that the first card is a club. You can then find the probability of the second card being a club, based on this prior knowledge.

Question 11 4 marks [10.2]

(a)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **basketball** | **not basketball** |  |
| **hockey** | 0.1 | 0.4 | 0.5 |
| **not hockey** | 0.3 | 0.2 | 0.5 |
|  | 0.4 | 0.6 | 1 |

**(b) (i)** Pr(not basketball and not hockey) = 0.2 **(ii)** Pr(not hockey) = 0.5

Question 12 4 marks [10.2]

|  |  |
| --- | --- |
| (a) | **(b) (i)** Pr(blue only) =  **(ii)** Pr(red only) =  **(iii)** Pr(blue and red) = 0 |

Question 13 5 marks [10.6]

|  |  |
| --- | --- |
| (a)  PM10_PR_SSb_11_04 | **(b)** Pr(MM) =  **(c)** Pr(different) = |

Question 14 5 marks [10.5]

There are 17 odd numbers (8 + 5 + 4) and 6 even numbers (4 + 2) so there are 23 cards in total.

**(a)** Pr(odd) =



**(b)** Pr(prime) = (remember, 1 is not a prime number)



**(c)** The universal set is now the odds, so 17 cards; this becomes the denominator. The numerator is the number of odd numbered cards less than 4, so 13 (8 + 5).  
Pr(< 4 given odd) = .



Question 15 4 marks [10.5, 10.6]

(a)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Student | Not student |  |
| Black belt | 8 | 12 | 20 |
| Not black belt | 24 | 36 | 60 |
|  | 32 | 48 | 80 |

(b) (i) Pr(student with a black belt) = 

(ii) Pr(not student and no black belt) = 

Question 16 8 marks [10.3]

**(a)** *n*(multiples of 3 or 7) = 13 + 5 – 1 = 17  
Pr(multiple of 3 or 7) = 

**(b)** Factors of 8 or 20: 1, 2, 4, 5, 8, 10, 20  
Pr(factor of 8 or 20) = 

**(c)** *n*(odd or factor of 18) = 20 + 3 [2, 6 and 18] = 23  
Pr(odd or factor of 18) = 

**(d)** Pr(neither a multiple of 3 nor 7)  
= 1 – Pr(multiple of 3 or 7)  
**=** 1 –   
**=** 

Question 17 6 marks [10.3]

(a) The sample space is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (1, 1) | (2, 1) | (3, 1) | (4, 1) | (5, 1) | (6, 1) |
| (1, 2) | (2, 2) | (3, 2) | (4, 2) | (5, 2) | (6, 2) |
| (1, 3) | (2, 3) | (3, 3) | (4, 3) | (5, 3) | (6, 3) |
| (1, 4) | (2, 4) | (3, 4) | (4, 4) | (5, 4) | (6, 4) |
| (1, 5) | (2, 5) | (3, 5) | (4, 5) | (5, 5) | (6, 5) |
| (1, 6) | (2, 6) | (3, 6) | (4, 6) | (5, 6) | (6, 6) |

(b) (i) There are 6 doubles: 

(ii) Three pairs add to 4:  
(3, 1), (2, 2), (1, 3).  
So the probability is .

(iii) Three pairs add to 4 and four pairs add to 5:  
(4, 1), (3, 2), (2, 3) and (1, 4).  
So the probability is .

(iv) There is column and one row of twos with an overlap at (6, 6).  
Pr(at least one 6) = .

Question 18 3 marks [10.6]

(a) One or two names = 4 + 4 × 3 = 16 possible names

(b) Pr(Amy or Amy Rose) =



Question 19 4 marks [10.4]

|  |  |
| --- | --- |
| (a)  **C:\Users\uhernda\Downloads\PM2e-10-ch-test-exams\_CORRECTED_041016\PM2e_10_EB_11_SATS_02.jpg** | (b) (i) Pr(HHH) =  (ii) Pr(TTH) =  (iii) Pr(two tails and one heads)  = Pr(HTT, THT, TTH)  = Pr(HTT) + Pr(THT) + Pr(TTH)  =  = |

Question 20 4 marks [10.6]

(a) **(i)** Pr(RR) =



(ii) Pr(RB) =



(iii) Pr(RB or BR) = 2 ×



(b) Pr(neither blue) =



Short answer total marks: 50

Extended answer section

Question 21 6 marks [10.2, 10.5]

|  |  |  |
| --- | --- | --- |
| (a)    (b) These employees are outside the circles but inside the rectangle. | **(c) (i)** Pr(admin) =  **(ii)** Pr(at least 2 skills)  **(iii)** Pr(no more than 1 skill)  **(iv)** Pr(exactly 1 skill) = | (d) Pr(WP given MYOB) =  = |

Extended answer results: 8

TOTAL test results: 66