Multiple-choice section

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

Question 1 [10.3]

B

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

Question 2 [10.5]

C

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

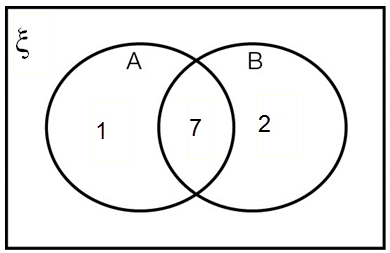
Question 3 [10.1]

B

There are 30 prizes in total with 18 (8 + 10) movie tickets: 

Question 4 [10.2]

A



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

Question 5 [10.5]

C

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

Question 6 [10.3]

C

Pr(2 or club) =  =  = 

Question 7 [10.5]

D

18 of the 36 outcomes give an odd total.

Odd totals involving 3: (2, 3), (4, 3), (6, 3), (3, 2), (3, 4), (3, 6).

Pr(3 given odd total) =  = .

Question 8 [10.4]

D

One tails is obtained by HT or TH; both of these have probability 0.6 × 0.4 = 0.24, and two tails by TT with a probability of 0.4 × 0.4 = 0.16, so the answer is 0.24 + 0.24 + 0.16 = 0.64.

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 9 marks [10.1]

|  |  |
| --- | --- |
| (a)  **C:\Users\uhernda\Downloads\PM2e-10-ch-test-exams\_CORRECTED_041016\PM2e_10_EB_11_SBTS_01.jpg** | **(b)** **(i)** Pr(YY) =  **(ii)** Pr(same colour) = =  **(iii)** Pr(RO or OR) =  **(iv)** Pr(different colours) = 1 – Pr(same colour) = 1 –  = |

Question 13 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 [i.e. 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 14 5 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 15 5 marks [10.6]

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

Question 16 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) Pr(student with a black belt) = 

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

Question 17 6 marks [10.2, 10.5]

|  |  |
| --- | --- |
| (a) | (b) (i) Pr(LW) =  (ii) Pr(L given W) =  (iii) Pr(W given L) = |

Question 18 6 marks [10.2]

**(a)** 2 × 8 = 16 **(b)** 12 × 2 = 24

**(c)** 12 × 8 = 96 **(d)** 2 × 8 × 12 = 192

Question 19 4 marks [10.6]

**(a)** He hasn’t scored yet so his probability is still .

**(b)** Pr(both) = 

Question 20 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:   
 so Pr(not a double) = 1 − 

(ii) Six pairs add to 7:  
(6, 1), (5, 2), (4, 3), (3, 4), (2, 5), (1, 6)  
So the probability is 

(iii) 6 pairs that add to 7 and there are 5 pairs that add to 6:  
(5, 1), (4, 2), (3, 3), (2, 4) and (1, 5)  
So the probability is .

(iv) This is everything except (2, 2), so the probability is .

Question 21 4 marks [10.6]

**(a)** 0.5 × 0.6 × 0.4 = 0.12

**(b)** 0.5 × 0.4 × 0.6 = 0.12

**(c)** Need to consider three possibilities:  
GGR, GRG and RGG  
0.5 × 0.6 × 0.6 + 0.5 × 0.4 × 0.4 + 0.5 × 0.6 × 0.4  
= 0.18 + 0.08 + 0.12  
= 0.38

Question 22 4 marks [10.4]

(a) Pr(RR) = 

(b) Pr(RB) = 

(c) Pr(RB or BR) = 2 × 

(d) Pr(neither blue) = 

Question 23 2 marks [10.6]

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

(b) Pr(Amy or Amy Rose) = 

Short answer total marks: 70

Extended answer section

Question 24 10 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)** Employees not in any of the intersecting places (don’t forget outside circles). Pr(no more than 1 skill) =  **(iv)** Pr(exactly 1 skill) = |

(d) Pr(WP given MYOB)  
=   
= 

Question 25 7 marks [10.5]

|  |  |
| --- | --- |
| (a)  PM10_PR_SSb_11_06 | (b) (i) Pr(A and acceptable) = 0.45 × 0.85 = 0.3825  (ii) Pr(B and unacceptable) = 0.55 × 0.05 = 0.0275 |

(c) Pr(unacceptable)  
= 0.45 × 0.15 + 0.55 × 0.05  
= 0.0675 + 0.0275  
= 0.095

Pr(Machine A given unacceptable)  


Extended answer results: 17

TOTAL test results: 95