Multiple-choice section

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

Question 1 [10.3]

B

Mutually exclusive means they cannot both occur at the same time.  
An Ace and a King must be different cards so these events are mutually exclusive.

Question 2 [10.5]

**B**

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

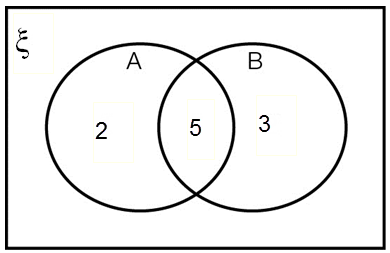
Question 3 [10.1]

C

There are 25 prizes in total with 15 (7 + 8) movie tickets: 

Question 4 [10.2]

D



7 + 8 = 15, so the overlap (intersection) is 5.



Question 5 [10.5]

**A**

The first card not being an ace means you still have 4 aces in the 51 cards.

Question 6 [10.3]

D

Pr(Q or heart) =  =  = 

Question 7 [10.5]

A

18 of the 36 outcomes give an even total.

Even totals involving just one 4: (2, 4), (6, 4), (4, 2), (4, 6).

Pr(one 4 given even total) =  = 

Question 8 [10.4]

C

Pr(HT) + Pr(TH)

= 0.6 × 0.4 + 0.4 × 0.6

= 0.24 + 0.24

= 0.48

Multiple-choice total marks: 8

Short answer section

Question 9 2 marks [10.2]

(a) The two events ‘a number greater than 4’ and ‘a number less than or equal to 4’ are complementary events.

(b) The list of all possible outcomes is called the sample space.

Question 10 1 mark [10.4]

If A and B are independent events, then the outcome of event A has no bearing on the outcome of event B, and vice versa.

Question 11 4 marks [10.2]

(a)

|  |  |  |  |
| --- | --- | --- | --- |
|  | tennis | not tennis |  |
| squash | 0.1 | 0.5 | 0.6 |
| not squash | 0.2 | 0.2 | 0.4 |
|  | 0.3 | 0.7 | 1 |

(b) (i) Pr(neither sport) = 0.2 (ii) Pr(not squash) = 0.4

Question 12 9 marks [10.1]

|  |  |
| --- | --- |
| (a)  **C:\Users\uhernda\Downloads\PM2e-10-ch-test-exams\_CORRECTED_041016\PM2e_10_EB_11_SATS_01.jpg** | (b) (i) Pr(RR) =  (ii) Pr(same colour) =  =  (iii) Pr(RB or BR) =  =  (iv) Pr(different colours) = 1 – Pr(same colour) = 1 –  = |

Question 13 8 marks [10.3]

**(a)** *n*(multiples of 2 or 5) = 15 + 6 – 3 = 18  
Pr(multiple of 2 or 5) =  = 

**(b)** Factors of 10 or 12: 1, 2, 3, 4, 5, 6, 10, 12  
Pr(factor of 10 or 12) =  = 

**(c)** *n*(even or factor of 24) = 15 + 2 [i.e. 1 and 3] = 17  
Pr(even or factor of 24) = 

**(d)** Pr(neither a multiple of 2 nor 5)  
= 1 – Pr(multiple of 2 or 5)  
**=** 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)  =  = |

Question 15 5 marks [10.6]

|  |  |
| --- | --- |
| (a)  PM10_PR_SSa_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 × 6 = 12 **(b)** 8 × 2 = 16

**(c)** 8 × 6 = 48 **(d)** 2 × 6 × 8 = 96

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: 

(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 (2, 2).  
Pr(at least one 2) = .

Question 21 4 marks [10.6]

**(a)** 0.6 × 0.4 × 0.3 = 0.072

**(b)** 0.4 × 0.6 × 0.7 = 0.168

**(c)** Need to consider three possibilities:  
GGR, GRG and RGG  
0.6 × 0.4 × 0.7 + 0.6 × 0.6 × 0.3 + 0.4 × 0.4 × 0.3  
= 0.168 + 0.108 + 0.048  
= 0.324

Question 22 4 marks [10.4]

(a) Pr(RR) = 

(b) Pr(RB) = 

(c) Pr(RB or BR) = 2 × 

(d) Pr(neither blue) = 

Question 23 3 marks [10.6]

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

(b) Pr(Taylor Grace) = 

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.  (d) Pr(WP given MYOB) =  = | (c) (i) Pr(administration)  =  (ii) Pr(at least 2 skills)  (iii) Pr(at most 1 skill) = 1 – Pr(at least 2 skills) = 1 –  =  (iv) Pr(1 skill) = |

Question 25 7 marks [10.5]

|  |  |  |
| --- | --- | --- |
| (a)  PM10_PR_SSa_11_06 | | (b) (i) Pr(A and acceptable) = 0.4 × 0.95 = 0.38  (ii) Pr(B and unacceptable) = 0.6 × 0.1 = 0.06 |
| (c) Pr(unacceptable) = 0.4 × 0.05 + 0.6 × 0.1 = 0.02 + 0.06 = 0.08 | Pr(Machine A given unacceptable) | |

Extended answer results: 17

TOTAL test results: 95