Multiple-choice section

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

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 [10.4]

C

Pr(HT) + Pr(TH)

= 0.6 × 0.4 + 0.4 × 0.6

= 0.24 + 0.24

= 0.48

Question 3 [10.5]

**B**

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

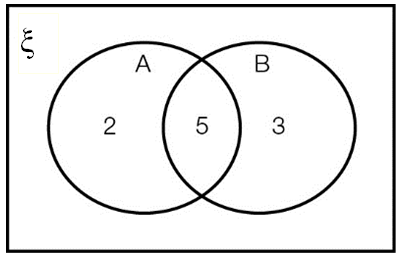
Question 4 [10.1]

C

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

Question 5 [10.2]

D



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

Question 6 [10.5]

**A**

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

Question 7 [10.6]

**B**

There are 36 outcomes, 6 of which are doubles. So, Pr(get a double) = .

Question 8 [10.3]

D

Pr(Q or heart) =  =  = 

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 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_SF_11_02 | **(b)** Pr(MM) =  **(c)** Pr(different) = |

Question 14 5 marks [10.5]

There are 17 odd numbers (6 + 4 + 7) and 8 even numbers (3 + 5) so there are 25 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 10 (6 + 4).  
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 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 [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 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 (2, 2).  
Pr(at least one 2) = 

Question 18 3 marks [10.6]

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

(b) Pr(Taylor Grace) = 

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(HTT, THT, 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 8 marks [10.2, 10.5]

|  |  |  |
| --- | --- | --- |
| (a)    (b) These employees are outside the circles but inside the rectangle. | (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) | (d) Pr(WP given MYOB) =  = |

Extended answer results: 8

TOTAL test results: 66