Multiple-choice section

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Answer | B | C | D | D | A | C | 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 [10.1]

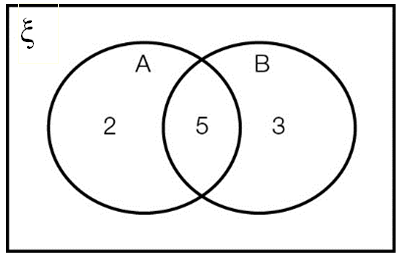
C

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


Question 3 [10.2]

D

A quick Venn diagram will help answer this question.



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

Question 4 [10.3]

D

Pr(Q or heart) =  =  = 

Question 5 [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 6 [10.4]

C

Pr(HT) + Pr(TH)

= 0.6 × 0.4 + 0.4 × 0.6

= 0.24 + 0.24

= 0.48

Question 7 [10.4]

B

Pr(first correct, others wrong)

=  ×  ×  ×  × 

= 

Correct answer could be first, second, third, fourth or fifth:

Pr(one correct) =  × 5 = 

Question 8 [10.5]

D

|  |  |  |  |
| --- | --- | --- | --- |
|  | Sport | Cinema |  |
| Correct | 3.2 | 0.6 | 3.8 |
| Wrong | 4.8 | 1.4 | 6.2 |
|  | 8 | 2 | 10 |

Pr(sport given correct) =  = 

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_ATS_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 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(HTT, THT, TTH)  =  = |

Question 14 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 15 6 marks [10.2, 10.5]

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

Question 16 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 17 6 marks [10.2]

(a) Sample space:  
(1HH), (1HT), (1TH), (1TT), (2HH), (2HT), (2TH), (2TT), (3HH), (3HT), (3TH), (3TT)  
(4HH), (4HT), (4TH), (4TT), (5HH), (5HT), (5TH), (5TT), (6HH), (6HT), (6TH), (6TT)

|  |  |
| --- | --- |
| (b)  C:\Users\uhernda\AppData\Local\Temp\SNAGHTML93db53.PNG | (c) (i) Pr(not A and not B) =  =  (ii) Pr(A but not B) =  = |

Question 18 5 marks [10.3]

(a) (i) Pr(A) =  = , so A has 15 elements.

(ii) Pr(B) =  = , so B has 20 elements.

(iii) Pr(A or B) =  = , so the union of A and B has 25 elements.

(iv) 15 + 20 = 35 so the overlap has 10 elements.

(b) Sample answers:  
A: Even numbers  
B: Numbers greater than 10  
A or B: 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

Question 19 4 marks [10.4]

(a) Pr(RR) =  (b) Pr(RB) = 

(c) Pr(RB or BR) = 2 ×  (d) Pr(neither blue) = 

Question 20 3 marks [10.6]

Two reds and a black:

Pr(RRB, RBR or BRR) = 3 × 

Two blacks and a yellow:

Pr(BBY, BYB or YBB) = 3 × 

Pr(a black and two red or a yellow two black) = 

Question 21 4 marks [10.6]

(a) Pr(pair of red Kings) = Pr(pair of black Kings) =   
Pr(two Kings of same colour) = 

(b) Pr(King of spades and King of hearts or diamonds) = 2 × 

Question 22 3 marks [10.6]

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

(b) Pr(Taylor Grace) = 

Short answer total marks: 62

Extended answer section

Question 23 6 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) =  = |

Question 24 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: 15

TOTAL test results: 85