2024 VCE General Mathematics 1 (NHT) external assessment report

Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

| **Question** | **Correct answer** | **Comments** |
| --- | --- | --- |
| 1 | C |  |
| 2 | B |  |
| 3 | E |  |
| 4 | C |  |
| 5 | B |  |
| 6 | D |  |
| 7 | C | Age is a numerical variable and uses public transport is a categorical variable, so parallel boxplots are the appropriate form of display. |
| 8 | A | Determine the equation of the least squares line.    165  Key points calculated as (59, 37.6) and (65, 24.6) |
| 9 | D |  |
| 10 | E |  |
| 11 | C |  |
| 12 | E | Determine the coefficients of determination for each pair.  coefficient 1 = 0.845, coefficient 2 = 0.915, coefficient 3 = 0.948.  Correct rank order from largest to smallest is coefficient 3, coefficient 2, coefficient 1 (0.948, 0.915, 0.845). |
| 13 | C |  |
| 14 | B |  |
| 15 | D | 17% decrease means multiplying factor is 0.83  Seasonal index = |
| 16 | D | Summer index = 4 – (0.85 + 0.96 + 0.45) = 1.74  1.74 = , Average = = 19 034.482 …  Total annual attendance = 4 × 19 034 = 76 136 ≈ 76 140 |
| 17 | E |  |
| 18 | E |  |
| 19 | A |  |
| 20 | E |  |
| 21 | D |  |
| 22 | D | The recurrence relation given could represent a reducing balance loan, an annuity or a perpetuity. |
| 23 | B | Use Finance Solver to determine:   |  |  | | --- | --- | | 1) regular payment amount x  N = 15 × 12  I%= 3.75  PV = 450 000  PMT = SOLVE =  FV = 0  P/Y = 12  C/Y = 12 | 2) determine when the balance is $350 000  N = SOLVE = 49.61  I%= 3.75  PV = 450 000  PMT =  FV = 350 000  P/Y = 12  C/Y = 12 |   3) 49.61 months = 4.13 years  Four years after 2024 = 2028 |
| 24 | A | The investment is increasing by a factor of 1.08  Based on this factor time period 3 would have a value of 14000 × 1.083 = 17 653.97  The value used to calculate time period 4 is 19 288.80/1.08 = 17 860  The extra one-off amount = 17860.00 – 17635.97 = 224.03 |
| 25 | C |  |
| 26 | E |  |
| 27 | A |  |
| 28 | E |  |
| 29 | D |  |
| 30 | B | If Q = R, this implies that multiplying by the permutation matrix P does not change the position order of the elements T, A, L, L, Y in matrix R.  Therefore, P could equal  or  where keeps each element in its original position, swaps the two elements in rows 3 and 4 of matrix *R* |
| 31 | E | Of the meerkats sleeping in chamber A on Friday night, eight had slept in chamber B on the previous night, so that:  8 = 0.2 × b, b = 40  If eight meerkats left chamber B on the previous night then eight must come from chamber A to chamber B to maintain the constant number of b, so that:  8 = 0.4 × a, a = 20  Total number of meerkats = a + b = 20 + 40 = 60 |
| 32 | C | From  , we get  or      The number of vanilla subscribers increases from 60 to 120 after the first month of sales, an increase of 60. |
| 33 | D |  |
| 34 | C |  |
| 35 | B |  |
| 36 | A |  |
| 37 | E | Euler's rule: v + f = e + 2  Checking the graphs:  Graph 1 Contains a complete pentagon, hence cannot be planar, hence the rule does NOT apply  Graph 2 Can be redrawn as planar (see below left)  Graph 3 Can be redrawn as planar (see below right)  Graph 4 Is already planar  Graphs 2, 3 and 4 are planar, hence Euler's rule can be applied |
| 38 | B | Minimum cut = maximum flow = 13 + 16 + 9 + 17 + 21 = 76  (12 is flowing from exit to entrance) |
| 39 | D |  |
| 40 | A | One approach is to create a diagram.:  A diagram of a triangle with arrows and letters  Description automatically generated  Checking the options  A. H requires C and F. C requires A and F requires D which requires B. Given each activity has a minimum of 1 hour, EST (H) would be 3 NOT TRUE  B. F requires D only and G requires D and E TRUE  C. The path BDGJ can be traced TRUE  D. If LST (E) is 3, then LST (D) will also be 3. Path BDFHL will now be 7 days (minimum) which is longer than BEGJ at 6 days. TRUE  E I requires E only and F requires D only, but G requires both D and E TRUE |