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.  165Key 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 0.83Seasonal 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 × 12I%= 3.75PV = 450 000PMT = SOLVE = FV = 0P/Y = 12C/Y = 12 | 2) determine when the balance is $350 000 N = SOLVE = 49.61I%= 3.75PV = 450 000PMT = FV = 350 000P/Y = 12C/Y = 12 |

3) 49.61 months = 4.13 yearsFour years after 2024 = 2028 |
| 24 | A | The investment is increasing by a factor of 1.08Based on this factor time period 3 would have a value of 14000 × 1.083 = 17 653.97The value used to calculate time period 4 is 19 288.80/1.08 = 17 860The 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 = 40If 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 = 20Total 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 + 2Checking the graphs:Graph 1 Contains a complete pentagon, hence cannot be planar, hence the rule does NOT applyGraph 2 Can be redrawn as planar (see below left)Graph 3 Can be redrawn as planar (see below right)Graph 4 Is already planarGraphs 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 generatedChecking the optionsA. 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 TRUEB. F requires D only and G requires D and E TRUEC. The path BDGJ can be traced TRUED. 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. TRUEE I requires E only and F requires D only, but G requires both D and E TRUE  |