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**QUALITATIVE ANALYSIS OF LEARNER RESPONSES AND EVALUATION OF QUESTION PAPERS: NSC 2021**

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| **REPORT 1: EVALUATION OF THE QUESTION PAPER AND MARKING GUIDELINE** |

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| **SUBJECT** | **ENGINEERING GRAPHICS AND DESIGN** |
| **PAPER** | **1** |
| **DURATION OF PAPER:** | **3 HOURS** |

**SECTION 1: (General overview of Learner Performance in the question paper as a whole)**

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| The paper was poorly answered. Most candidates attempted all the questions. The handwriting of candidates leaves much to be desired, making the marking difficult. Text must be clear and legible. The line work of the candidates is poor. Although neatness is not taken into account, line quality is critical in the subject. Remember each line type has a specific meaning in EGD. There must be a clear difference between Outlines (type A) and Construction lines; Fold Lines (Type B) |

**SECTION 2: Comment on candidates’ performance in individual questions**

**(It is expected that a comment will be provided for each question).**

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| **QUESTION 1** |
| 1. **General comment on the performance of learners in the specific questions. Was the questions well answered or poorly answered?** |
| Poorly answered, the majority of the candidates could answer the lower order questions. Middle and higher order questions were very poorly answered. |

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| 1. **Why was some questions poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.** |
| Q1.6 to1.17 Are middle to higher order questions, These answers are more than recall, the skill required is application of knowledge, i.e. this means you have learn theory and then apply the knowledge.  Q1.18 Calculation of the perimeter: formula is PERIMETER = S + S + S+ …  The information to calculate is found in the survey table    Q1.19 Calculation of area: AREA = L x B    In both cases the application might require some subtraction as well.    Q1.20 Symbols from the SANS 10143: Bidet has been asked in previous papers. Take note of the marks awarded to the symbol in the diagram. |

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| 1. **Provide suggestions for improvement in relation to Teaching and Learning** |
| This question must be practiced, Teacher must use previous papers and WORK through the answers with the learners. Many of the answers are reading the drawing to find the relevant information. The symbols are to be found in the SANS documents, as well as textbooks, teachers must approach their subject advisors for the SANS documents. |

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| **(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.** |
| Neat presentation of answers, i.e., writing legibly is very important. Working calculations in an orderly manner, CONVERT FROM mm to m FIRST, THEN write the formula: perimeter = S+S+S+S. Area = LxB, then enter values. Freehand drawing is a skill the must be sharpened through pratice. Make sure the FAP is used in these freehand drawings. Line quality makes the freehand easier to read. |

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| **QUESTION 2** |
| 1. **General comment on the performance of learners in the specific questions. Was the questions well answered or poorly answered?** |
| This question was extremely poorly answered. It is clear that there was very little time spent on this section of the work. The candidates mostly only redrew the given detail and at that it was poorly done. |

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| 1. **Why was some questions poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.** |
| Candidates do not understand what FIRST ANGLE ORTHOGRAPHIC projection means. The candidates redrew the given detail to the dimensions, The problem areas were the placement of the RIGHT VIEW, the construction of the triangular pipe from a given centre point was very badly answered. The following was to place the triangle and hexagon centre lines in the same plane. In the top view the candidate cannot draw a right regular hexagon. These are skills that are taught in grade 10.  Projecting between the Right view and the top view was not done correctly.  Projecting from both right and top view to the front view was a challenge. The placement of the top view from the XY line was not adhered to. Most candidates did not do the curve of interpenetration, even fewer candidates attempted the development. The development was not unfolded at side SS. |

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| 1. **Provide suggestions for improvement in relation to Teaching and Learning** |
| With this topic the correct use of LINE TYPES is very important. The outer edges of the development are type A lines and the fold line are type B lines – line quality is not part of neatness. Neatness is about finishing of a drawing that there are no unnecessary extensions, or dirty marks on the drawing. Line Quality is about the reading of the drawing. There should be a clear difference between type A and B lines. |

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| **(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.** |
| LINE QUALITY must be practised. Candidates SBA work must not be accepted if line quality is not good. The interpenetration exercises are many. Remember that the interpenetrations can be at angles as well. In gr 12 the centre lines of the two objects will be in the same plane.  The candidates must know how to construct the basic shapes like triangle, hexagons, pentagons. This is critical grade 10 work. |

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| **QUESTION 3** |
| 1. **General comment on the performance of learners in the specific questions. Was the questions well answered or poorly answered?** |
| This question was poorly answered. Candidates could mostly determine the VP’s. |

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| 1. **Why was some questions poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.** |
| The determining of vanishing points has improved. Accuracy needs attention, Neatness, although not penalised, is very important with in 2PP. A good quality drawing board and T-Square is beneficial to quality drawing. When doing circle arc in perspective it is important to show the circle division in the views, the projection to the VP and height line must be traceable. The given HL, PP and GL MUST NOT BE MOVED. The construction/ projection lines for each corner must be visible. LINE QUALITY is very important. |

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| 1. **Provide suggestions for improvement in relation to Teaching and Learning** |
| Work through previous papers. Pay attention to the quality of line work, neatness is critical to these 2PP. There are 2 methods to determine the position of corners, i.e.: Block method and Height Line method. Refer to textbooks and many YouTube videos (search EGD; 2-point perspective). Start with simple shapes against the PP and then moving them back. The SP does not have to be in line with any corners of the object. The candidates must use the given HL, GL and SP. They MAY NOT be moved. Construction of circle requires that the given arc be divided with 30°;60° the projected to the height line the to the VP’s. |

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| **(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.** |
| VP’s must be labelled LVP; RVP.  The candidates must use the given HL, GL and SP. They MAY NOT be moved.  Circle construction needs attention. |

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| **QUESTION 4** |
| 1. **General comment on the performance of learners in the specific questions. Was the questions well answered or poorly answered?** |
| All candidates attempted the question. The plan was answered by all candidates.  In general. the question was answered poorly, though there were some excellent answers. |

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| 1. **Why were some questions poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.** |
| PLAN:  Windows not sized to what is given. Doors too small for frame; door swing arc not too size. Rooflines not completed and incorrect line type. Symbols for fixtures not used and incorrect size. Incorrect placement of fixtures. Electrical fittings not using appropriate symbols. Wires connected to flag of switches. Hatching in freehand; wrong pattern; incomplete.  NORTH ELEVATION  Projection of roof line from PLAN, using given height for facia from data sheet. Inaccurate determining of given roof angle. Projection from plan to determine position of the walls, roof overhang, facia, gutter and RWDP with gulley. Projection of wrong side of the building to the North elevation (sliding door side) in place of veranda side.  DETAILED SECTION  Roof detail dimensions are given, converting to scale 1 : 20 is inaccurate. Candidates do not know the parts and position of parts in the roof construction. Purlins are not drawn as rectangle and not squarely placed to the roof truss. Purlin c/c not applied.  The detailed section drawn in wrong direction shows that candidates do not know how to use the cutting plane.  The freehand hatching of the wall below the floor slab. Dimensions for the wall window, floor slab etc is ignored.  Hatching not neat. |

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| 1. **Provide suggestions for improvement in relation to Teaching and Learning** |
| PLAN:  Doors must fit the given space in the doorframe. The arc must be drawn with a compass or circle stencil.  Single lines can be used for the door, as per example.  Window frames are smaller than the given space on the answer sheet. The frame should be spaced in the middle of the opening. The window information is found in the door and window schedule. The frame of the window is in the middle of the wall and the windowsill must extend beyond the wall of the house. The sill normally extends 50 mm from the wall. that means on scale of 1 : 50 the sill extends 1 mm.      The rooflines were given on the incomplete floor plan and only had to be copied onto the answer sheet.  The electrical symbols are given in the data sheet, the exterior light fitting should be drawn away from the wall so that all the details can be seen.  Light switches use circles and sockets use semi circles. The wiring MUST NOT be connected to the flag of the switches.    NORTH ELEVATION:  The walls are projected from the top view. The height to the bottom of the facia is given.  The height of the facia is given as well as the angle of the roof.  The rooflines are projected from the completed rooflines in the top view  The incomplete gutters and roof caps MUST be completed.  The door and window are projected from the floor plan. The dimensions are taken from the window and door schedule. The FFL is a chain line, it is shown in the diagram above.  DETAILED SECTION:  The diagrams on the data page are NOT a guide to the answer, the purpose of the diagrams is to give the candidates dimensions to answer the specific questions. See the example: The diagram is for a section through the veranda of the house. The cutting plane is in different place    The effect is that in the detailed section the roof is to the left and there is NO concrete slab to the right of the wall. |

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| **(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.** |
| Line quality is very important. When marking SBA work, the line work must be checked, and sloppy line work must be corrected. The basic structure of a building is standard, it is only the dimensions that change. With enough examples there is no excuse for the poor answering of this question. Attention to details important for completing this question. |