**Electronic Circuits**

**Final Exam Spring 2021**

**Reg. No:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Please see the appendix for your values. Your answers should strictly correspond to the parameter values written against your Reg. No. Wrong answers shall be graded zero even if the method is correct. Print your answer on the line in front of each required parameter in the question paper.

Submit both the filled question paper and pdf of your answer sheet.

Q1. Using the characteristics of Fig.1, determine βdcat I*B=X*µA and *VCE=*4 V. calculate αdcand the resulting level of *IE*.

βdc =\_\_\_\_\_96\_\_\_\_\_\_\_\_, αdc\_\_0.989\_\_\_\_\_\_\_\_, IE\_\_\_\_5.86\_\_\_\_\_\_\_\_\_\_\_mA.

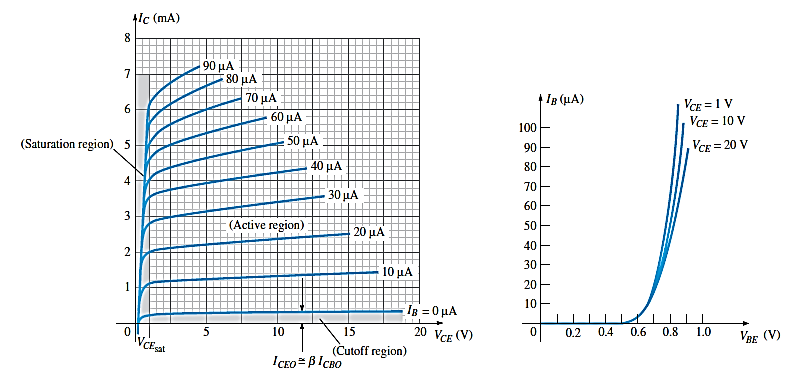
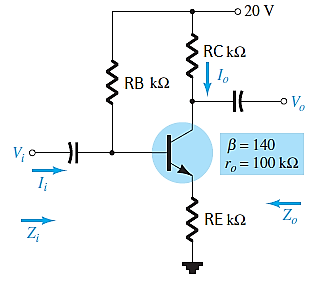
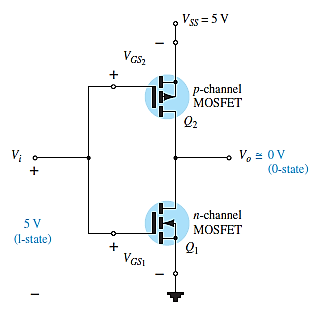
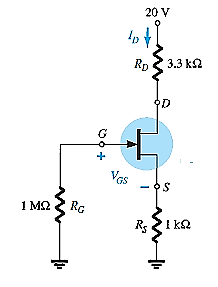


Figure 2

Figure 1

Q2. For the network of Fig. 2, determine:

1. *IB*. \_\_\_30uA\_\_\_\_\_\_\_\_\_\_
2. *IC*. \_\_\_4.2mA\_\_\_\_\_\_\_\_\_\_
3. *VCE*. \_\_13.028v\_\_\_\_\_\_\_\_\_\_\_
4. *VC*. \_\_18.866v\_\_\_\_\_\_\_\_\_\_\_
5. *VE*. \_\_\_5.938\_\_\_\_\_\_\_\_\_\_



Q3. For the network of Fig. 2, determine:

1. *re. \_\_\_\_\_4.01ohm\_\_\_\_\_\_\_\_\_\_\_*
2. *Zi*. \_\_\_\_7.4ohm\_\_\_\_\_\_\_\_

Figure 3

1. *Zo*. \_\_\_\_1.66kohm\_\_\_\_\_\_\_\_
2. *Av*. \_\_\_\_\_-1.181\_\_\_\_\_\_\_

Q4.

1. Sketch the transfer and drain characteristics of a *p*-channel depletion-type MOSFET with*IDSS* and*VP* given in the table in the Appendix, using short hand method.
2. Briefly describe in your own words the operation of the circuit of Fig. 3. (Warning: All similar descriptions shall be considered copied and graded zero)

Q5.

Determine the following for the network of Fig. 4 when IDSS and VP are given in the Appendix:

(a). *VGSQ*. \_\_3.9v\_\_\_\_\_\_\_(b). *IDQ*.­­­­­­­­­­­­­\_\_\_3.8mA\_\_\_\_\_\_(c). *VDS*. \_\_\_3.66v\_\_\_\_\_(d). *VS*.­­­\_\_\_\_3.8v\_\_\_\_(e). *VG*.\_\_\_\_\_7.7v\_\_\_\_ Figure 4

**Appendix**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Registration #** | **Name** | Q1 | Q2, Q3 | | | Q4 | | Q5 | |
|  |  |  | IB=X(µA) | RB(k Ohms) | RC(k Ohms) | RE (k Ohms) | IDSS (mA) | VP (V) | IDSS (mA) | VP (V) |
| 1 | 19PWCSE1741 | ABDUL BASIT | 60 | 430 | 2.35 | 1.45 | 8 | 9 | 8 | -9 |
| 2 | 19PWCSE1743 | ZAINAB KHALID | 40 | 415 | 1.61 | 1.37 | 9 | 10 | 9 | -12 |
| 3 | 19PWCSE1745 | TALHA NAWAZ | 60 | 463 | 2.5 | 1.43 | 8 | 9 | 8 | -8 |
| 4 | 19PWCSE1747 | MUHAMMAD AAMIR IBRAHIM | 70 | 420 | 2.48 | 0.92 | 8 | 8 | 8 | -12 |
| 5 | 19PWCSE1749 | SYED MOHSIN SHAH | 20 | 454 | 2.19 | 0.62 | 11 | 12 | 11 | -9 |
| 6 | 19PWCSE1750 | MUHAMMAD FASIH ZAMAN | 20 | 475 | 1.99 | 1.43 | 8 | 11 | 8 | -10 |
| 7 | 19PWCSE1752 | LAIBA SAEED | 30 | 461 | 2.28 | 1.16 | 11 | 8 | 11 | -10 |
| 8 | 19PWCSE1753 | AMRINA NIZAM | 10 | 461 | 2.07 | 0.82 | 11 | 9 | 11 | -11 |
| 9 | 19PWCSE1755 | AMMAR AHMAD | 50 | 462 | 1.93 | 1.45 | 8 | 10 | 8 | -11 |
| 10 | 19PWCSE1757 | IQRA ALI | 30 | 467 | 2.25 | 1.41 | 8 | 12 | 8 | -8 |
| 11 | 19PWCSE1759 | WAJID ULLAH | 60 | 467 | 2.1 | 0.72 | 9 | 11 | 9 | -9 |
| 12 | 19PWCSE1761 | MUHAMMAD UZAIR | 70 | 474 | 1.94 | 0.82 | 11 | 11 | 11 | -9 |
| 13 | 19PWCSE1763 | MUHAMMAD | 20 | 462 | 2.09 | 0.69 | 9 | 12 | 9 | -12 |
| 14 | 19PWCSE1765 | SHAH ZADA FAHIM JAN | 60 | 453 | 1.89 | 0.71 | 11 | 12 | 11 | -12 |
| 15 | 19PWCSE1767 | WAREESHA KHAN | 20 | 480 | 2.37 | 1.46 | 10 | 8 | 10 | -11 |
| 16 | 19PWCSE1770 | ANIS AHMAD | 50 | 438 | 2.38 | 1.45 | 13 | 9 | 13 | -11 |
| 17 | 19PWCSE1772 | AJWAD SHARAHEEL | 30 | 455 | 2.02 | 1.27 | 10 | 11 | 10 | -9 |
| 18 | 19PWCSE1774 | SAMRA JAMAL | 70 | 414 | 1.75 | 1.13 | 12 | 9 | 12 | -12 |
| 19 | 19PWCSE1776 | YASEEN IRSHAD | 10 | 479 | 1.85 | 1.42 | 11 | 9 | 11 | -8 |
| 20 | 19PWCSE1778 | MUHAMMAD HAMMAD | 20 | 468 | 2.1 | 0.7 | 8 | 8 | 8 | -12 |
| 21 | 19PWCSE1781 | HASNAIN AHMAD KHAN | 60 | 474 | 2.33 | 1.44 | 12 | 11 | 12 | -11 |
| 22 | 19PWCSE1783 | ATIQA AZEEM | 20 | 465 | 1.78 | 1.31 | 12 | 8 | 12 | -11 |
| 23 | 19PWCSE1786 | MUHAMMAD WALEED | 10 | 433 | 1.99 | 0.8 | 12 | 10 | 12 | -11 |
| 24 | 19PWCSE1788 | SYED SHAAF ALI SHAH BANOORI | 20 | 471 | 1.99 | 0.79 | 13 | 12 | 13 | -9 |
| 25 | 19PWCSE1790 | MUHAMMAD LATIF | 40 | 469 | 1.52 | 0.87 | 9 | 10 | 9 | -8 |
| 26 | 19PWCSE1792 | TALHA KHURSHED | 60 | 413 | 2.25 | 0.82 | 9 | 9 | 9 | -8 |
| 27 | 19PWCSE1794 | MUHAMMAD FAHAD SHAH | 20 | 467 | 1.78 | 0.62 | 12 | 11 | 12 | -9 |
| 28 | 19PWCSE1796 | ZAIN UL ABIDEEN | 50 | 452 | 2.09 | 1.02 | 13 | 10 | 13 | -8 |
| 29 | 19PWCSE1797 | ZUBAIR KHAN | 10 | 415 | 2.39 | 0.69 | 9 | 8 | 9 | -9 |
| 30 | 19PWCSE1799 | ABDUL MAJID | 70 | 469 | 1.56 | 1.5 | 10 | 12 | 10 | -9 |
| 31 | 19PWCSE1801 | MUHAMMAD ALI | 40 | 450 | 1.72 | 0.93 | 10 | 11 | 10 | -11 |
| 32 | 19PWCSE1802 | HAMZA DAUD | 50 | 474 | 2.33 | 1.43 | 13 | 12 | 13 | -8 |
| 33 | 19PWCSE1804 | TAYYABA ZEB | 50 | 427 | 1.8 | 0.73 | 10 | 11 | 10 | -8 |
| 34 | 19PWCSE1806 | SHAHANA ALI | 70 | 412 | 1.87 | 1.1 | 13 | 10 | 13 | -9 |
| 35 | 19PWCSE1807 | TIHAM KHAN | 30 | 441 | 1.79 | 0.8 | 10 | 11 | 10 | -12 |
| 36 | 19PWCSE1809 | WAHIZA KHAN | 20 | 424 | 1.72 | 1.41 | 9 | 9 | 9 | -11 |
| 37 | 19PWCSE1811 | MUHAMMAD ASIM | 10 | 478 | 1.63 | 0.72 | 8 | 9 | 8 | -9 |
| 38 | 19PWCSE1812 | SHARIQ KHALIL | 50 | 455 | 2.41 | 0.55 | 13 | 12 | 13 | -8 |
| 39 | 19PWCSE1814 | MUHAMMAD YASEEN | 10 | 412 | 2.1 | 1.12 | 9 | 8 | 9 | -10 |
| 40 | 19PWCSE1740 | SHARIQ HAMEED | 20 | 437 | 2.43 | 1.42 | 8 | 10 | 8 | -8 |
| 41 | 19PWCSE1742 | SULEMAN KHAN | 10 | 439 | 2.3 | 0.81 | 11 | 11 | 11 | -11 |
| 42 | 19PWCSE1744 | FATIMA KALSOOM | 10 | 467 | 2.11 | 1.25 | 12 | 12 | 12 | -12 |
| 43 | 19PWCSE1746 | ATTA ULLAH | 70 | 450 | 2.4 | 1.11 | 11 | 10 | 11 | -11 |
| 44 | 19PWCSE1748 | JANNAT NOOR | 10 | 450 | 1.88 | 1.13 | 9 | 8 | 9 | -10 |
| 45 | 19PWCSE1751 | KAMRAN JALIL | 30 | 470 | 2.09 | 1.41 | 12 | 9 | 12 | -11 |
| 46 | 19PWCSE1754 | USMAN YAQOOB | 50 | 426 | 2.21 | 0.98 | 13 | 8 | 13 | -11 |
| 47 | 19PWCSE1756 | WISAL MUKHTIAR | 70 | 414 | 1.81 | 1.02 | 10 | 10 | 10 | -9 |
| 48 | 19PWCSE1758 | MUHAMMAD UMAR | 70 | 421 | 1.62 | 1.34 | 10 | 12 | 10 | -8 |
| 49 | 19PWCSE1760 | SAIF ULLAH | 10 | 465 | 2.13 | 0.77 | 11 | 9 | 11 | -11 |
| 50 | 19PWCSE1762 | ROMAN KHAN | 20 | 433 | 1.94 | 0.53 | 9 | 11 | 9 | -8 |
| 51 | 19PWCSE1764 | UMAIR ALI KHAN | 40 | 442 | 2.3 | 1.24 | 11 | 12 | 11 | -9 |
| 52 | 19PWCSE1766 | WALIIYA RIZWAN | 50 | 465 | 2.29 | 1.31 | 10 | 9 | 10 | -8 |
| 53 | 19PWCSE1768 | ANEELA HABIB | 60 | 410 | 1.64 | 1.49 | 11 | 8 | 11 | -8 |
| 54 | 19PWCSE1769 | SHAH HUSSAIN | 50 | 454 | 1.82 | 0.59 | 9 | 9 | 9 | -10 |
| 55 | 19PWCSE1771 | NAQASH TABASSUM | 70 | 468 | 1.83 | 0.62 | 13 | 11 | 13 | -8 |
| 56 | 19PWCSE1773 | USWA SAJID | 10 | 465 | 2.11 | 1.27 | 9 | 8 | 9 | -8 |
| 57 | 19PWCSE1775 | AKBAR SHAH | 50 | 420 | 2.1 | 0.88 | 8 | 12 | 8 | -11 |
| 58 | 19PWCSE1777 | OSAMA KHAN | 20 | 437 | 2.41 | 1.23 | 13 | 12 | 13 | -11 |
| 59 | 19PWCSE1779 | SHAH WALI KHAN | 60 | 420 | 2.07 | 0.58 | 10 | 12 | 10 | -12 |
| 60 | 19PWCSE1780 | SANARAIZ ULLAH KHAN | 70 | 471 | 1.53 | 1.1 | 9 | 11 | 9 | -11 |
| 61 | 19PWCSE1782 | HILAL AHMAD | 60 | 465 | 1.91 | 1.15 | 8 | 10 | 8 | -12 |
| 62 | 19PWCSE1784 | MUHAMMAD FARHAN | 50 | 435 | 1.88 | 1.22 | 9 | 9 | 9 | -11 |
| 63 | 19PWCSE1785 | MUHAMMAD HAMAYUN | 50 | 416 | 2.48 | 0.83 | 10 | 12 | 10 | -9 |
| 64 | 19PWCSE1787 | MUHAMMAD AFNAN SAQIB | 30 | 410 | 2.18 | 0.91 | 12 | 11 | 12 | -8 |
| 65 | 19PWCSE1789 | ABDUL RAHEEM | 50 | 453 | 1.72 | 1.21 | 11 | 11 | 11 | -10 |
| 66 | 19PWCSE1791 | MUHAMMAD ATTIQ UR REHMAN | 40 | 429 | 1.8 | 1.13 | 13 | 11 | 13 | -11 |
| 67 | 19PWCSE1793 | MUHAMMAD HASSAM KHAN | 10 | 450 | 2.13 | 0.68 | 12 | 10 | 12 | -9 |
| 68 | 19PWCSE1795 | ASHFAQ AHMAD | 60 | 427 | 1.66 | 1.4 | 8 | 8 | 8 | -9 |
| 69 | 19PWCSE1798 | ZIA UL ISLAM | 20 | 428 | 1.54 | 0.91 | 9 | 10 | 9 | -10 |
| 70 | 19PWCSE1800 | HAJRA MASOOD | 20 | 417 | 1.85 | 1.36 | 13 | 11 | 13 | -11 |
| 71 | 19PWCSE1803 | AFAQ AHMAD | 30 | 452 | 2.43 | 0.58 | 10 | 11 | 10 | -11 |
| 72 | 19PWCSE1805 | AMIR SULIMAN | 10 | 448 | 2.19 | 0.74 | 9 | 9 | 9 | -11 |
| 73 | 19PWCSE1808 | HASSAN JADOON | 20 | 420 | 2.25 | 1.43 | 11 | 11 | 11 | -8 |
| 74 | 19PWCSE1810 | MUHAMMAD UMER SOHAIL | 30 | 456 | 2.29 | 1.37 | 12 | 12 | 12 | -10 |
| 75 | 19PWCSE1813 | WALEED TAHIR | 30 | 440 | 2.15 | 0.78 | 9 | 11 | 9 | -12 |
| 76 | 19PWCSE1815 | MUZAMIL SHAH | 30 | 452 | 1.76 | 0.89 | 13 | 9 | 13 | -11 |
| 77 | 19PWCSE1816 | ABDULLAH BIN ALTAF | 50 | 410 | 2.33 | 1.01 | 10 | 10 | 10 | -8 |
| 78 | 19PWCSE1858 | MANSOOR HUSSAIN | 40 | 479 | 2.1 | 1.13 | 11 | 10 | 11 | -10 |
| 79 | 18PWCSE1716 | AWAIS SALEEM | 20 | 416 | 1.75 | 1.27 | 12 | 8 | 12 | -9 |
| 80 | 19PWCSE1818 | SAIF ULLAH KHAN | 20 | 437 | 2.34 | 0.94 | 11 | 12 | 11 | -11 |
| 81 | 19PWCSE1819 | HAMZA KHAN | 60 | 410 | 2.15 | 1.05 | 13 | 10 | 13 | -10 |
| 82 | 19PWCSE1820 | ZARAK HABIB | 50 | 422 | 1.9 | 0.59 | 8 | 8 | 8 | -9 |
| 83 | 19PWCSE1821 | HARIS QAYUM | 10 | 479 | 2.49 | 1.27 | 13 | 9 | 13 | -11 |
| 84 | 19PWCSE1822 | MUHAMMAD HAMZA KHAN | 20 | 446 | 1.57 | 0.88 | 9 | 12 | 9 | -12 |
| 85 | 19PWCSE1823 | USMAN AHMAD | 70 | 475 | 1.67 | 0.87 | 12 | 9 | 12 | -11 |
| 86 | 19PWCSE1824 | UMER ALI | 20 | 417 | 1.92 | 0.74 | 9 | 12 | 9 | -9 |
| 87 | 19PWCSE1825 | MUHAMMAD UZAIR | 10 | 442 | 2.33 | 1.5 | 10 | 10 | 10 | -12 |
| 88 | 19PWCSE1826 | MUHAMMAD SUBHAN GHANI | 20 | 455 | 2.35 | 1.41 | 8 | 10 | 8 | -11 |
| 89 | 19PWCSE1827 | SINEEN SALEEM | 50 | 445 | 2.35 | 1.1 | 10 | 9 | 10 | -9 |
| 90 | 19PWCSE1828 | MOHAMMAD RAAFEH SAJJAD | 60 | 424 | 2.23 | 1.31 | 13 | 12 | 13 | -8 |
| 91 | 19PWCSE1829 | WASSAM REHMAN KHALID | 30 | 439 | 1.69 | 1.28 | 13 | 8 | 13 | -8 |
| 92 | 19PWCSE1830 | SIKANDAR KHAN | 10 | 421 | 2.2 | 0.55 | 11 | 10 | 11 | -12 |
| 93 | 19PWCSE1831 | TUBAH FARWA | 30 | 428 | 2.31 | 0.66 | 8 | 11 | 8 | -10 |
| 94 | 19PWCSE1832 | SAMAR UROOJ AZIZ | 60 | 438 | 1.55 | 0.8 | 11 | 11 | 11 | -11 |
| 95 | 19PWCSE1833 | KINZA HUMAYUN | 50 | 440 | 2.26 | 1.34 | 8 | 11 | 8 | -8 |
| 96 | 19PWCSE1834 | HAMZA ALI KHAN | 20 | 465 | 1.86 | 1.4 | 12 | 12 | 12 | -9 |
| 97 | 19PWCSE1835 | M. ABDULLAH AZIZ AWAN | 40 | 411 | 2.45 | 1.27 | 9 | 8 | 9 | -10 |
| 98 | 19PWCSE1836 | SAAD BIN MASOOD | 30 | 457 | 2.43 | 0.62 | 9 | 11 | 9 | -9 |
| 99 | 19PWCSE1837 | MUHAMMAD AHSAN BILAL | 50 | 458 | 2.09 | 1.2 | 10 | 10 | 10 | -11 |
| 100 | 19PWCSE1838 | SAMI ULLAH | 70 | 465 | 1.94 | 1.24 | 10 | 12 | 10 | -12 |
| 101 | 19PWCSE1839 | SHUJA MUBASHIR | 60 | 451 | 2.14 | 0.97 | 10 | 10 | 10 | -11 |
| 102 | 19PWCSE1840 | SYEDA LAIBA NASIR | 50 | 469 | 2.27 | 1.07 | 12 | 10 | 12 | -10 |
| 103 | 19PWCSE1841 | MALIK ZOHAIB | 10 | 428 | 2.21 | 0.71 | 11 | 11 | 11 | -9 |
| 104 | 19PWCSE1842 | ALI REHMAN | 70 | 452 | 1.8 | 1.04 | 13 | 11 | 13 | -11 |
| 105 | 19PWCSE1843 | UMAR ZAFAR SHAH | 20 | 454 | 2.41 | 1.4 | 13 | 10 | 13 | -11 |
| 106 | 19PWCSE1844 | MUHAMMAD QASIM | 30 | 411 | 2.26 | 0.6 | 13 | 12 | 13 | -12 |
| 107 | 19PWCSE1845 | FAWAD ALI | 10 | 458 | 2.2 | 1.46 | 11 | 11 | 11 | -9 |
| 108 | 19PWCSE1846 | ABDUL BASIT | 30 | 458 | 1.57 | 0.84 | 9 | 9 | 9 | -11 |
| 109 | 19PWCSE1847 | NAVEED RASHID | 60 | 436 | 2.3 | 1.25 | 8 | 8 | 8 | -11 |
| 110 | 19PWCSE1848 | EHSAN ULLAH | 20 | 440 | 2.4 | 0.87 | 9 | 11 | 9 | -11 |
| 111 | 19PWCSE1849 | ANAS ABRAR | 40 | 473 | 2.42 | 0.93 | 8 | 10 | 8 | -9 |
| 112 | 19PWCSE1850 | JAMAL KHAN | 50 | 433 | 1.75 | 0.66 | 12 | 11 | 12 | -9 |
| 113 | 19PWCSE1851 | MUHAMMAD SAUD SHAKEEL | 60 | 446 | 1.78 | 0.98 | 8 | 8 | 8 | -10 |
| 114 | 19PWCSE1852 | ABDULLAH BABAR | 20 | 426 | 2.22 | 1.41 | 10 | 11 | 10 | -12 |
| 115 | 19PWCSE1853 | MUHAMMAD ALI | 40 | 427 | 1.58 | 0.77 | 13 | 11 | 13 | -11 |
| 116 | 19PWCSE1854 | TAYYABA | 30 | 413 | 2.02 | 0.75 | 12 | 11 | 12 | -11 |
| 117 | 19PWCSE1855 | JALAL SHAH | 70 | 418 | 1.85 | 0.78 | 9 | 9 | 9 | -10 |
| 118 | 19PWCSE1856 | ABID ALI | 10 | 432 | 1.71 | 1.21 | 13 | 11 | 13 | -9 |
| 119 | 19PWCSE1857 | UZAIR AHMAD | 10 | 454 | 1.75 | 0.72 | 9 | 8 | 9 | -11 |
| 120 | 15pwcse1368 |  | 50 | 431 | 2.18 | 0.81 | 12 | 12 | 12 | -10 |
| 121 | 16pwcse1450 |  | 50 | 422 | 1.58 | 1.16 | 8 | 11 | 8 | -10 |
| 122 | 15pwcse1366 |  | 60 | 429 | 2.14 | 1.24 | 11 | 10 | 11 | -10 |
| 123 | 17pwcse1603 |  | 50 | 424 | 2.48 | 1.4 | 13 | 9 | 13 | -10 |
| 124 | 16pwcse1465 |  | 50 | 477 | 1.65 | 0.89 | 8 | 9 | 8 | -8 |
| 125 | 16pwcse1477 |  | 40 | 475 | 1.97 | 1.29 | 11 | 10 | 11 | -8 |
| 126 | 17pwcse1575 |  | 60 | 469 | 2.33 | 1.48 | 10 | 9 | 10 | -9 |
| 127 | 17pwcse1602 |  | 10 | 438 | 1.7 | 1.44 | 11 | 12 | 11 | -11 |
| 128 | 17pwcse1554 |  | 60 | 423 | 1.8 | 0.81 | 8 | 9 | 8 | -9 |
| 129 | 16pwcse1496 |  | 30 | 464 | 2.21 | 1.13 | 13 | 8 | 13 | -8 |
| 130 | 17pwcse1587 |  | 10 | 418 | 1.68 | 0.75 | 12 | 8 | 12 | -9 |
| 131 | 17pwcse1500 |  | 30 | 424 | 2.24 | 1.09 | 9 | 10 | 9 | -12 |
| 132 | 16pwcse1490 |  | 10 | 413 | 1.56 | 1.24 | 12 | 12 | 12 | -10 |
| 133 | 17pwcse1516 |  | 50 | 426 | 1.89 | 0.87 | 13 | 8 | 13 | -11 |