Microbiology (XL-S)

Question Number : 56 **Correct : 1 Wrong : -0.33**

Which one of the following is the end product of dissimilatory sulfate reduction by sulfate reducing bacteria?

(A) Hydrogen sulfide (B) Sulfur dioxide (C) Sulfur (D) Thiosulfate

Question Number : 57 **Correct : 1 Wrong : -0.33**

Which one of the following is the terminal electron acceptor in the given metabolic reaction catalyzed by methanogens?

$$4H_2 + CO_2 \longrightarrow CH_4 + 2H_2O$$

(A) H_2 (B) CO_2 (C) CH_4 (D) H_2O

Question Number : 58 **Correct : 1 Wrong : -0.33**

Microbes that have their optimal growth rate near 15 °C but can still grow at 0 °C to 20 °C are known as

(A) mesophiles (B) psychrotrophs (C) psychrotolerant (D) psychrophiles

Question Number : 59 **Correct : 1 Wrong : -0.33**

Which one of the following is NOT a contribution by Robert Koch?

(A) Identification of causative agent of anthrax.
(B) Discovery of causative agent of tuberculosis.
(C) Discovery of causative agent of leprosy.
(D) Identification of causative agent of cholera.

Question Number : 60 **Correct : 1 Wrong : -0.33**

Unicellular eukaryotic organisms belong to which one of the following kingdoms of classification?

(A) Monera (B) Plantae (C) Protista (D) Animalia

Question Number : 61 **Correct : 1 Wrong : -0.33**

Which one of the following is a contagious disease?

(A) Chickenpox (B) Tetanus (C) Malaria (D) Filariasis

Question Number : 62 **Correct : 1 Wrong : -0.33**

The inner mitochondrial membrane comprises of a series of folds known as

(A) cristae (B) thylakoids (C) cisterns (D) cilia

Question Number : 63 **Correct : 1 Wrong : -0.33**

Which one of the following antibiotics is NOT produced by *Streptomyces* sp.?

(A) Amphotericin B
(B) Neomycin
(C) Vancomycin
(D) Gentamicin

Question Number : 64 **Correct : 1 Wrong : -0.33**

Which one of the following statements is TRUE about MacConkey (MAC) agar medium?

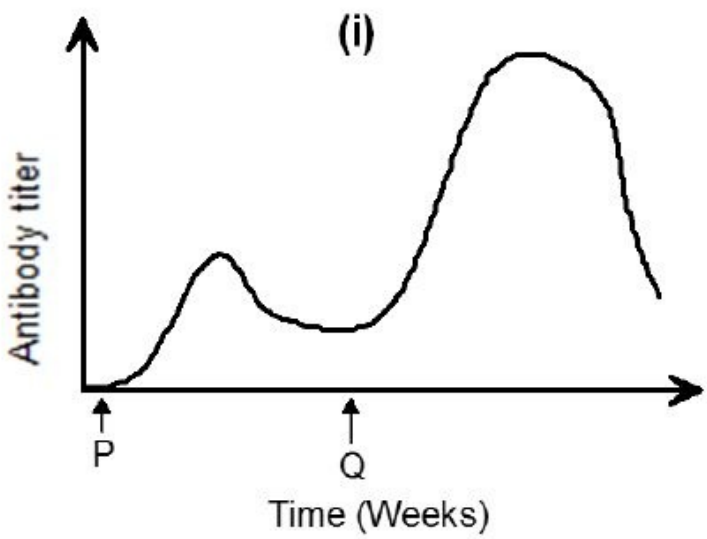
(A) MAC agar medium is a selective and differential medium for Gram-positive bacteria.
(B) MAC agar medium is a selective and differential medium for Gram-negative bacteria.
(C) MAC agar medium is an enriched medium for Gram-positive bacteria.
(D) MAC agar medium is a synthetic medium for Gram-positive and Gram-negative bacteria.

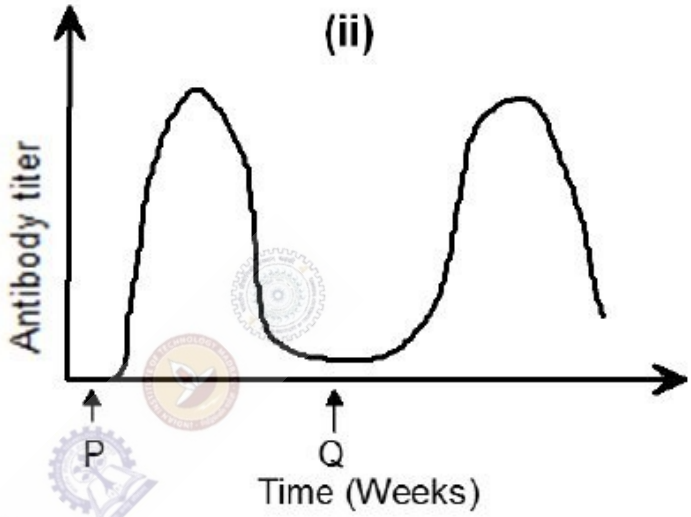
Question Number : 65 **Correct : 1 Wrong : -0.33**

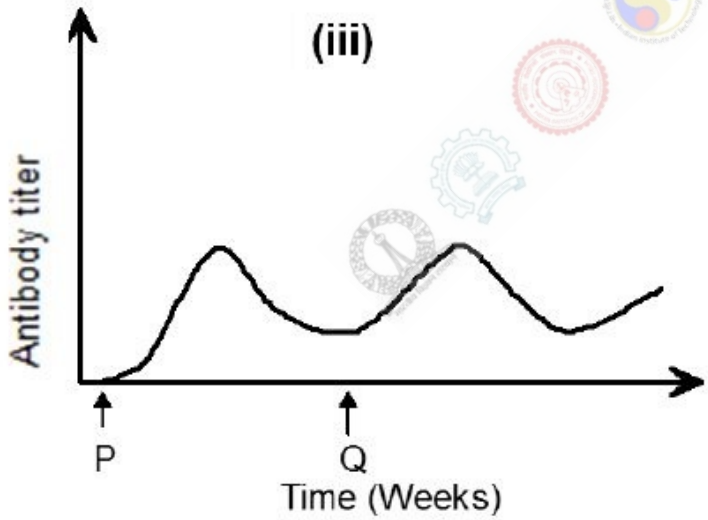
As an antiseptic, alcohol is effective against

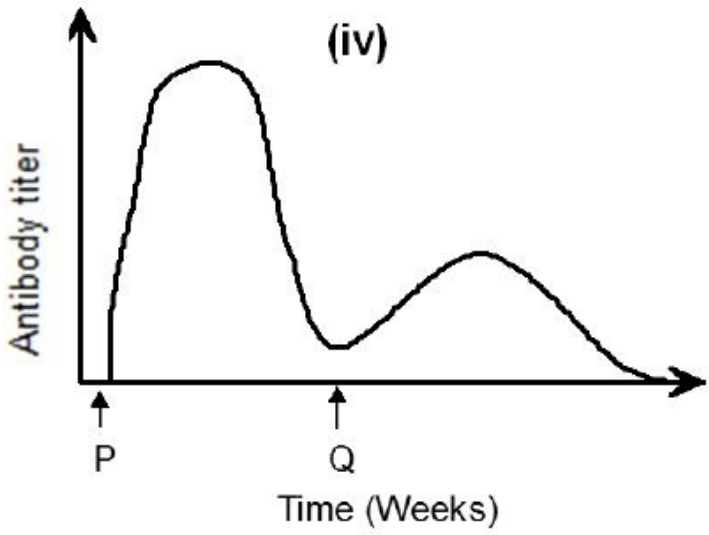
(A) bacteria and non-enveloped viruses
(B) bacterial endospores and fungi
(C) bacteria and fungi
(D) fungi and non-enveloped viruses

An antigen X was injected into a rabbit for the first time at time P. Then the rabbit was given a booster dose of X at time Q. Which one of the following figures accurately depicts the adaptive immune response by the rabbit against X?





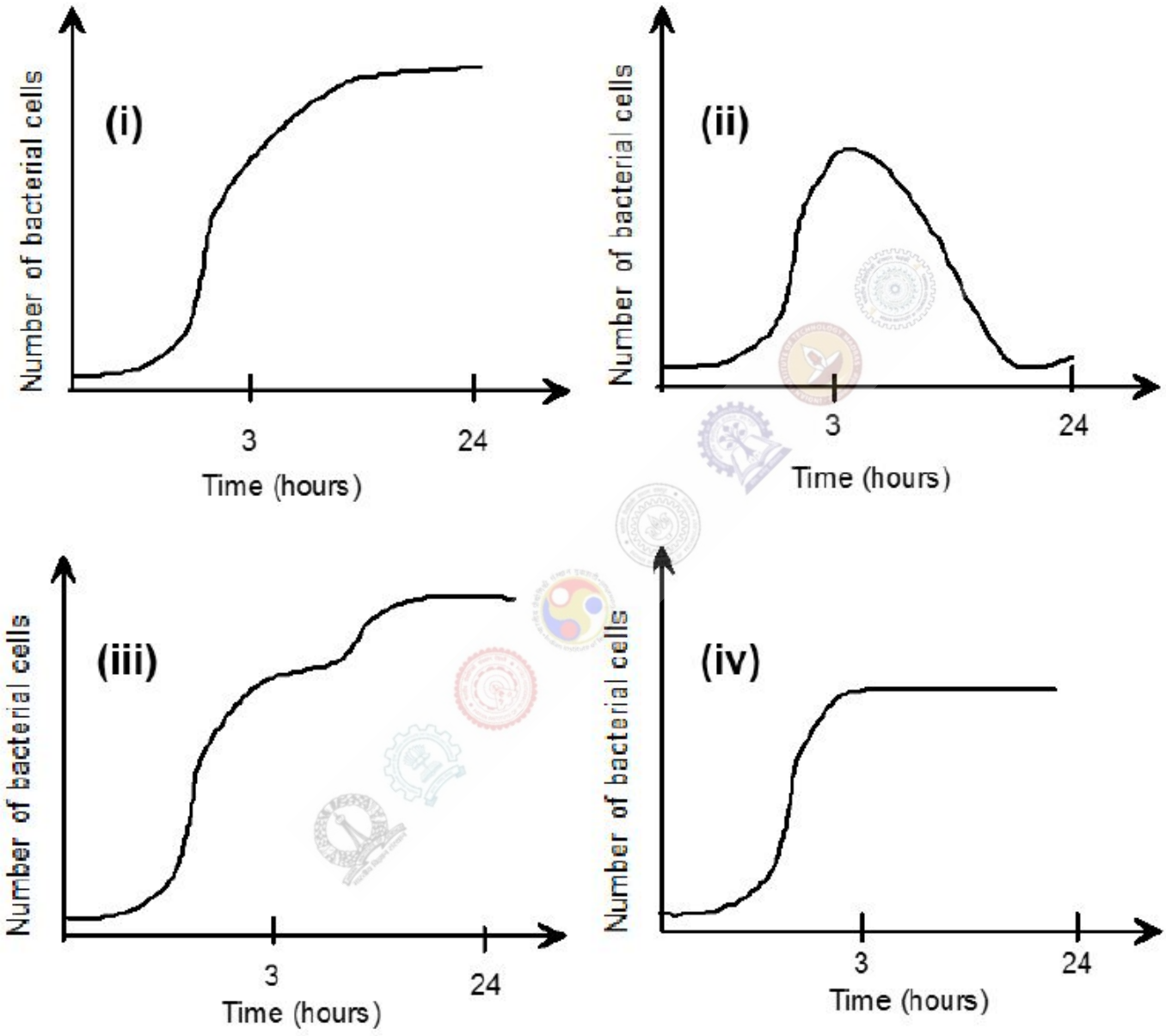




(A) i (B) ii (C) iii (D) iv

Question Number : 67 **Correct : 2 Wrong : -0.66**

A bactericidal agent X is added after 3 hours of growth of a bacterial culture. Following the addition of X, the bacterial growth was measured using the standard plate count method till 24 hours. Which one of the following figures is the most accurate representation of the action of X?



(A) i (B) ii (C) iii (D) iv

Question Number : 68 **Correct : 2 Wrong : -0.66**

Match the diseases given in **Group I** with their causative agents from **Group II**.

Group I	**Group II**
(P) Plague	(I) *Coxiella burnetii*
(Q) Rabies	(II) *Plasmodium* spp.
(R) Q fever	(III) *Yersinia pestis*
(S) Malaria	(IV) *Lyssavirus*

(A) P-III, Q-IV, R-I, S-II
(B) P-III, Q-I, R-II, S-IV
(C) P-IV, Q-III, R-I, S-II
(D) P-III, Q-I, R-IV, S-II

Question Number : 69 **Correct : 2 Wrong : -0.66**

Match the enzymes given in **Group I** with the events from **Group II**.

Group I	**Group II**
(P) UvrABC endonuclease	(I) Retrovirus replication
(Q) Reverse transcriptase	(II) Base excision repair
(R) AP endonuclease	(III) Nucleotide excision repair
(S) ATP sulfurylase	(IV) Pyrosequencing

(A) P-II, Q-I, R-IV, S-III
(B) P-III, Q-I, R-II, S-IV
(C) P-IV, Q-III, R-I, S-II
(D) P-II, Q-I, R-III, S-IV

Question Number : 70 **Correct : 2 Wrong : -0.66**

Match the terms given in **Group I** with the descriptions from **Group II**.

Group I	**Group II**
(P) Photoautotrophs	(I) Use inorganic chemical reactions for energy production
(Q) Chemoautotrophs	(II) Use organic compounds for energy production
(R) Photoheterotrophs	(III) Use sunlight as energy source and carbon dioxide as carbon source
(S) Chemoheterotrophs	(IV) Use sunlight as energy source and organic compounds as carbon source

(A) P-II, Q-I, R-IV, S-III
(B) P-III, Q-I, R-IV, S-II
(C) P-IV, Q-III, R-I, S-II
(D) P-II, Q-IV, R-III, S-I

Question Number : 71 **Correct : 2 Wrong : 0**

One-ml sample of a bacterial culture was serially diluted to 10^5 times, and 46 colonies were obtained after plating this diluted sample on an agar medium. The number of cells present per ml in the undiluted original sample were _____

Question Number : 72 **Correct : 2 Wrong : 0**

The transformation efficiency of competent cells prepared in a laboratory is 10^4 CFU/µg of plasmid DNA. If 0.01 µg of this plasmid is used to transform these competent cells, the number of transformed bacteria in CFU after plating will be _____

Question Number : 73 **Correct : 2 Wrong : 0**

Assume that the average DNA content of a single microbial cell is 4 femtogram. A soil sample analyzed for its microbial community DNA is found to contain 0.32 µg DNA per gram of the soil. The number of microbial cells per milligram of the soil are _____

Question Number : 74 **Correct : 2 Wrong : 0**

Assume that a bacterial culture has a mean generation time of 2 hours. If the number of bacteria present after 24 hours of culture are 4.1×10^7, the initial number of bacteria present were _____

Question Number : 75 **Correct : 2 Wrong : -0.66**

The minimal inhibitory concentration (MIC) of an antibiotic X against *Clostridium tetani*, *Staphylococcus* sp., *Shigella* sp., and *Streptococcus* sp. is 25, 15, 2 and 1 µg/ml, respectively. Assuming that the bioavailable concentration of X in an animal model is 20 µg/ml, which one of these bacteria may develop resistance against X in the animal model?

(A) *Clostridium tetani*
(B) *Staphylococcus* sp.
(C) *Shigella* sp.
(D) *Streptococcus* sp.

General Aptitude

Question Number : 116 **Correct : 1 Wrong : -0.33**

The event would have been successful if you _____able to come.

(A) are (B) had been (C) have been (D) would have been

Question Number : 117 **Correct : 1 Wrong : -0.33**

There was no doubt that their work was thorough.

Which of the words below is closest in meaning to the underlined word above?

(A) pretty (B) complete (C) sloppy (D) haphazard

Question Number : 118 **Correct : 1 Wrong : -0.33**

Four cards lie on a table. Each card has a number printed on one side and a colour on the other. The faces visible on the cards are 2, 3, red, and blue.

Proposition: If a card has an even value on one side, then its opposite face is red.

The cards which MUST be turned over to verify the above proposition are

(A) 2, red (B) 2, 3, red (C) 2, blue (D) 2, red, blue

Question Number : 119 **Correct : 1 Wrong : -0.33**

What is the value of x when $81 \times \left(\frac{16}{25}\right)^{x+2} \div \left(\frac{3}{5}\right)^{2x+4} = 144$?

(A) 1 (B) -1 (C) -2 (D) Cannot be determined

Question Number : 120 **Correct : 1 Wrong : -0.33**

Two dice are thrown simultaneously. The probability that the product of the numbers appearing on the top faces of the dice is a perfect square is

(A) 1/9 (B) 2/9 (C) 1/3 (D) 4/9

Question Number : 121 **Correct : 2 Wrong : -0.66**

Bhaichung was observing the pattern of people entering and leaving a car service centre. There was a single window where customers were being served. He saw that people inevitably came out of the centre in the order that they went in. However, the time they spent inside seemed to vary a lot: some people came out in a matter of minutes while for others it took much longer.

From this, what can one conclude?

(A) The centre operates on a first-come-first-served basis, but with variable service times, depending on specific customer needs.
(B) Customers were served in an arbitrary order, since they took varying amounts of time for service completion in the centre.
(C) Since some people came out within a few minutes of entering the centre, the system is likely to operate on a last-come-first-served basis.
(D) Entering the centre early ensured that one would have shorter service times and most people attempted to do this.

Question Number : 122 **Correct : 2 Wrong : -0.66**

A map shows the elevations of Darjeeling, Gangtok, Kalimpong, Pelling, and Siliguri. Kalimpong is at a lower elevation than Gangtok. Pelling is at a lower elevation than Gangtok. Pelling is at a higher elevation than Siliguri. Darjeeling is at a higher elevation than Gangtok.

Which of the following statements can be inferred from the paragraph above?

i. Pelling is at a higher elevation than Kalimpong
ii. Kalimpong is at a lower elevation than Darjeeling
iii. Kalimpong is at a higher elevation than Siliguri
iv. Siliguri is at a lower elevation than Gangtok

(A) Only ii (B) Only ii and iii (C) Only ii and iv (D) Only iii and iv

Question Number : 123 Correct : 2 Wrong : -0.66

P, Q, R, S, T and U are seated around a circular table. R is seated two places to the right of Q. P is seated three places to the left of R. S is seated opposite U. If P and U now switch seats, which of the following must necessarily be true?

(A) P is immediately to the right of R
(B) T is immediately to the left of P
(C) T is immediately to the left of P or P is immediately to the right of Q
(D) U is immediately to the right of R or P is immediately to the left of T

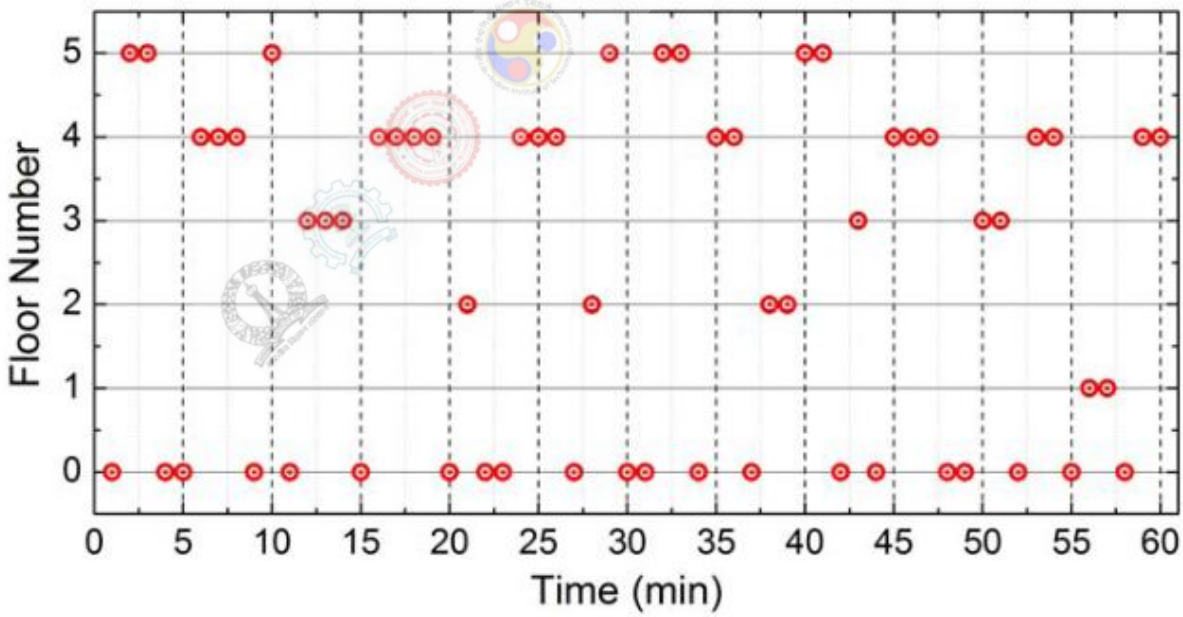
Question Number : 124 Correct : 2 Wrong : -0.66

Budhan covers a distance of 19 km in 2 hours by cycling one fourth of the time and walking the rest. The next day he cycles (at the same speed as before) for half the time and walks the rest (at the same speed as before) and covers 26 km in 2 hours. The speed in km/h at which Budhan walks is

(A) 1 (B) 4 (C) 5 (D) 6

Question Number : 125 Correct : 2 Wrong : -0.66

The points in the graph below represent the halts of a lift for durations of 1 minute, over a period of 1 hour.



Which of the following statements are correct?

i. The elevator never moves directly from any non-ground floor to another non-ground floor over the one hour period
ii. The elevator stays on the fourth floor for the longest duration over the one hour period

(A)) Only i (B) Only ii (C) Both i and ii (D) Neither i nor ii

Q. No.	Type	Section	Key	Marks
1	MCQ	XL-P	A	1
2	MCQ	XL-P	D	1
3	MCQ	XL-P	D	1
4	MCQ	XL-P	B	1
5	MCQ	XL-P	A	1
6	MCQ	XL-P	C	2
7	MCQ	XL-P	B	2
8	MCQ	XL-P	C	2
9	MCQ	XL-P	C	2
10	MCQ	XL-P	B	2
11	MCQ	XL-P	A	2
12	NAT	XL-P	13260 to 13285	2
13	MCQ	XL-P	A	2
14	MCQ	XL-P	C	2
15	MCQ	XL-P	A	2
16	MCQ	XL-Q	A	1
17	MCQ	XL-Q	D	1
18	MCQ	XL-Q	C	1
19	NAT	XL-Q	3.0 to 3.0	1
20	MCQ	XL-Q	B	1
21	MCQ	XL-Q	D	1
22	MCQ	XL-Q	C	1
23	MCQ	XL-Q	A	1
24	MCQ	XL-Q	C	1
25	MCQ	XL-Q	D	1
26	NAT	XL-Q	7575 to 7576	2
27	NAT	XL-Q	722 to 725	2
28	NAT	XL-Q	0.19 to 0.20	2
29	MCQ	XL-Q	D	2
30	NAT	XL-Q	9.0 to 9.0	2
31	MCQ	XL-Q	B	2
32	MCQ	XL-Q	A	2
33	MCQ	XL-Q	A	2
34	MCQ	XL-Q	A	2
35	MCQ	XL-Q	B	2
36	MCQ	XL-R	C	1

37	MCQ	XL-R	B	1
38	MCQ	XL-R	C	1
39	MCQ	XL-R	A	1
40	MCQ	XL-R	D	1
41	MCQ	XL-R	A	1
42	MCQ	XL-R	C	1
43	MCQ	XL-R	D	1
44	MCQ	XL-R	D	1
45	MCQ	XL-R	A	1
46	MCQ	XL-R	A	2
47	MCQ	XL-R	A	2
48	MCQ	XL-R	B	2
49	NAT	XL-R	18.3 to 18.5	2
50	NAT	XL-R	3.2 to 3.2	2
51	MCQ	XL-R	B	2
52	MCQ	XL-R	D	2
53	MCQ	XL-R	C	2
54	MCQ	XL-R	D	2
55	MCQ	XL-R	A	2
56	MCQ	XL-S	A	1
57	MCQ	XL-S	B	1
58	MCQ	XL-S	D	1
59	MCQ	XL-S	C	1
60	MCQ	XL-S	C	1
61	MCQ	XL-S	A	1
62	MCQ	XL-S	A	1
63	MCQ	XL-S	D	1
64	MCQ	XL-S	B	1
65	MCQ	XL-S	C	1
66	MCQ	XL-S	A	2
67	MCQ	XL-S	B	2
68	MCQ	XL-S	A	2
69	MCQ	XL-S	B	2
70	MCQ	XL-S	B	2
71	NAT	XL-S	4550000 to 4650000	2
72	NAT	XL-S	99 to 101	2
73	NAT	XL-S	78000 to 82000	2

74	NAT	XL-S	9990 to 10020	2
75	MCQ	XL-S	A	2
76	MCQ	XL-T	D	1
77	MCQ	XL-T	A	1
78	MCQ	XL-T	C	1
79	MCQ	XL-T	B	1
80	MCQ	XL-T	C	1
81	MCQ	XL-T	A	1
82	MCQ	XL-T	C	1
83	MCQ	XL-T	B	1
84	MCQ	XL-T	D	1
85	MCQ	XL-T	D	1
86	NAT	XL-T	8.0 to 8.0	2
87	NAT	XL-T	7.0 to 7.0	2
88	NAT	XL-T	0.55 to 0.55	2
89	NAT	XL-T	16 to 16	2
90	MCQ	XL-T	D	2
91	MCQ	XL-T	A	2
92	MCQ	XL-T	B or D	2
93	MCQ	XL-T	B	2
94	NAT	XL-T	42.0 to 42.0	2
95	NAT	XL-T	250 to 250	2
96	MCQ	XL-U	B	1
97	MCQ	XL-U	B	1
98	MCQ	XL-U	D	1
99	MCQ	XL-U	B	1
100	NAT	XL-U	1000 to 1000	1
101	MCQ	XL-U	A	1
102	NAT	XL-U	2078 to 2086	1
103	NAT	XL-U	0.80 to 0.90	1
104	MCQ	XL-U	A	1
105	MCQ	XL-U	D	1
106	MCQ	XL-U	C	2
107	MCQ	XL-U	B	2
108	MCQ	XL-U	D	2
109	NAT	XL-U	25550 to 25650	2
110	MCQ	XL-U	D	2

111	NAT	XL-U	53.30 to 55.25	2
112	NAT	XL-U	64.0 to 64.0	2
113	NAT	XL-U	10.80 to 11.20	2
114	NAT	XL-U	9000 to 9000	2
115	NAT	XL-U	0.30 to 0.40	2
116	MCQ	GA	B	1
117	MCQ	GA	B	1
118	MCQ	GA	C	1
119	MCQ	GA	B	1
120	MCQ	GA	B	1
121	MCQ	GA	A	2
122	MCQ	GA	C	2
123	MCQ	GA	C	2
124	MCQ	GA	D	2
125	MCQ	GA	D	2