IBM Global Services (Paper)

1. In 1978, a kg of paper was sold at Rs25/-. I f the paper rate increases at 1.5% more than inflation rate which is of 6.5% a year , then what wil be the cost of a kg of paper after 2 years?

a)29.12   (b) 29.72   (c) 30.12   (d) 32.65   (e) none of these

2. In A,B,C are having some marbles with each of them. A has giben B and C the same number of marbles they already have to each of them. then, B gave C and A the same no. of marbles they have, then C gave A and B the same no. of marbles they have. At the end A,B,and C have equal no. of marbles.

(i) If x,y,z are the marbles initially with A,B,C respectively. then the no of marbles B have at the end

(a) 2(x-y-z)   (b) 4(x-y-z) etc.

(ii)If the total no. of marbles are 72, then the no. of marbles with A at the starting
a. 20   b. 30   c. 32

3. If a car starts from A towards B with some velocity due to some problem in the engine after travelling 30km.If the car goes with 4/5 th of its actuval velocity the car reaches B 45min later to the actual time. If the car engine fails ofter travelling 45km, the car reaches the destination B 36min late to the actual time , what is the initial velocity of car and what is the distance between A and B in km

ans) 20 & 130.

4. A person has Rs 100/- in his pocket, he can as 25 pencils or 15books. He kept 15% of the money for travelling expenses and purchased 5 pencils.So how many books he can purchase with the remaining money.

6. The values of shares A,B and C from january to june are as follows.
OB
month A B C

JAN 30 60 80
FEB 35 65 85
MAR 45 75 65
APR 40 75 82
MAY 55 75 85
JUNE 50 75 80

i) During this period which share has undergone max fluctuation?
ii) In which month it is possible to buy B and C selling A?
iii) In which month the share values are very low?
iv) By purchasing one share of A and 4 each of B and C in the beginning of the period , to get max profit when this shares should be sold?
v) ?

7. In a computer institute 9 languages can taught. The module is of 6 months duration and only six languages each of one month can be taught. In addition to that BASIC is always there and should be in first month itself

word perfect is to be taught in the preceeding week of word star.
FORTRAN can not be taught until COBAL is coarsed prior to that

BINO, FIFO never be taught in single module

Languages are BASIC, WORD STAR, WORD PERFECT, FORTRAN, COBAL, BINO, FIFO, LOTUS, C
i. Of the following which module is possible based on above conditions.
ii) If word star is in 3rd month , what could be in 6th month.
iii) If COBAL is in the 2nd month and BINO in 6th month are there in addition to the above condition, FORTRAN will be in which month.

8. In a class , except 18 all are above 50 years. 15 are below 50 years of age. how many people are there

a) 30   b) 33   c) 36   d) none of these.

9. A square plot of some size , at four corners equal squares of some size are cut and is formed as open box. If this open box carries 128ml of oil. What is the size of the plate i.e. side

a.17   b.14   c.13

10. In a square , all the mid points are joined. the inner square is shaded. If the area of the square is A, what is the shaded area?

11. two questions on basic angles i.e given a circle, a few chords or diameter is drawn etc.

12.
@(a,b)= (a+b)/2
/(a,b)= a.b
*(a,b)= ab , if a=1, b=2 find
i) /(a,(@(a,b),*(a,b)))

13.
(x#y) = x+y-xy
(x*y) = (x+y)/2

i) (x#y)#(x*y) < (x#y), which of the below values of x, y will satisfy this equation
ii) (a*b)#(b*c)< (a#b)*(b*c) , what values of a,b,c satisfy the above.

14. By using the data given below answer the following questions.
B.tech M.sc M.A
male 20, female 80, total 60 some thing similar to that question.

i) 40% of females are B.Techs
ii) Half of the students are either from B.Techs of M.Scs
iii) ...
i. what is the no. of female B.techs
ii....
dont remember this question , just for an example this has been given .

45).
PS1 pwd
export PS1 results in
a). your primary prompt being your current directory
b). " " and secondary prompts being the current dir
c). " " prompt being your home dir
d). " " and secondary prompts being the home dir
e). None of the above.

8). If you type in the command nohup sort employees > list 2 > error out & and log off ,the

next time you log in . the output will be
a). in a file called list and the error will de typed in a file error out
b). there will be no file called list or error out
c). error will be logged in a file called list and o/p will be in error out
d). you will not be allowed to log in
e). none of the above

7). In UNIX a files i-node
a)is a data structure that defines all specifications of a file like the file size ,number of lines to a file ,permissions etc.
b).----
c). - - - --
d). _ _ _
(ans is ---------(a)

44). The UNIX shell is....
a).does not come with the rest of the system
b).forms the interface between the user and the kernal
c) does not give any scope for programming
d) deos not allow calling one program from with in another
e) all of the above
(ans is (b)

48).enum number { a=-1, b= 4,c,d,e}
what is the value of e ?
B
OB 7,4,5,15,3
(ans is 7) check again

3).The very first process created by the kernal that runs till the kernal process is haltes is
a)init
b)getty
c)
d)
e)none
(Ans is a)

47). Result of the following program is
```
main()
{
int i=0;
for(i=0;i<20;i++)
{
switch(i)
case 0:i+=5;
case 1:i+=2;
case 5:i+=5;
default i+=4;
break;}
printf("%d,",i);
}
}
```
a)0,5,9,13,17
b)5,9,13,17
c)12,17,22
d)16,21
e)syntax error
(Ans is d)

1) What is the result

```
main()
{
char c=-64;
int i=-32
unsigned int u =-16;
if(c>i){
printf("pass1,");
if(c<u)
printf("pass2");
else
printf("Fail2");}
else
printf("Fail1);
if(i<u)
printf("pass2");
else
printf("Fail2")
}
```
a)Pass1,Pass2
b)Pass1,Fail2
c)Fail1,Pass2
d)Fail1,Fail2
e)none
(Ans is c)

2) In the process table entry for the kernel process, the process id value is

a) 0   b) 1   c) 2   d) 255   e) it does not have a process table
entry
Ans) a

4) Which of the following API is used to hide a window
a) ShowWindow
b) EnableWindow
c) MoveWindow
d) SetWindowPlacement
e)None of the above
Ans) a

5) what will the following program do?
```
void main()
{
int i;
char a[]="String";
char *p="New Sring";
char *Temp;
Temp=a;
a=malloc(strlen(p) + 1);
strcpy(a,p); //Line no:9//
p = malloc(strlen(Temp) + 1);
strcpy(p,Temp);
printf("(%s, %s)",a,p);
free(p);
free(a);
} //Line no 15//
```

a) Swap contents of p & a and print:(New string, string)
b) Generate compilation error in line number 8
c) Generate compilation error in line number 5
d) Generate compilation error in line number 7
e) Generate compilation error in line number 1

6) In the following code segment what will be the result of the function,
```
value of x , value of y
{
unsigned int x=-1;
int y;
y = ~0;
if(x == y)
printf("same");
else
printf("not same");
}
```

a) same, MAXINT, -1
b) not same, MAXINT, -MAXINT
c) same , MAXUNIT, -1
d) same, MAXUNIT, MAXUNIT
e) not same, MAXINT, MAXUNIT
Ans) a

37) PATH = /bin : /usr : /yourhome The file /bin/calender has the following line in it cal 10 1997 The file /yourhome/calender has the following line in it cal 5 1997 If the current directory is /yourhome and calender is executed
a) The calendar for May 1997 will be printed on screen
b) The calendar for Oct 1997 will be printed on screen
c) The calendar for the current month(whatever it is) will be printed
d) Nothing will get printed on screen
e) An error massage will be printed

38) what will be the result of the following program ?
```
char *gxxx()
{
static char xxx[1024];
return xxx;
}

main()
{
char *g="string";
strcpy(gxxx(),g);
g = gxxx();
strcpy(g,"oldstring");
printf("The string is : %s",gxxx());
}
```
a) The string is : string
b) The string is :Oldstring
c) Run time error/Core dump
d) Syntax error during compilation
e) None of these
Ans) b

39) What will be result of the following program?
```
void myalloc(char *x, int n)
{
x= (char *)malloc(n*sizeof(char));
memset(x,\0,n*sizeof(char));
}
main()
{
char *g="String";
```

```
myalloc(g,20);
strcpy(g,"Oldstring");
printf("The string is %s",g);
}
```
a) The string is : String
b) Run time error/Core dump
c) The string is : Oldstring
d) Syntax error during compilation
e) None of these
Ans) c (check it)

40) which of the following function is used to repaint a window immediately
a) Sendmessage(hWnd,WM_PAINt,......)
b) InvalidateRect(.......)
c) MoveWindow
d) WM_COPY
e) None

41) which function is the entry point for a DLL in MS Windows 3.1
a) main
b) Winmain
c) Dllmain
d) Libmain
e) None
Ans) b

42) The standard source for standard input , standard output and standard error is
a) the terminal
b) /dev/null
c) /usr/you/input, /usr/you/output/, /usr/you/error respectively
d) NOne
Ans) a

43) What will be the result of the following program?
```
main()
{
char p[]="String";
int x=0;

if(p=="String")
{
printf("Pass 1");
if(p[sizeof(p)-2]=='g')
printf("Pass 2");
else
printf("Fail 2");
}
else
{
printf("Fail 1");
if(p[sizeof(p)-2]=='g')
printf("Pass 2");
else
printf("Fail 2");
}
}
```

a) Pass 1, Pass 2
b) Fail 1, Fail 2
c) Pass 1, Fail 2
d) Fail 1, Pass 2

e) syntax error during compilation

46) Which of the choices is true for the mentioned declaration ?
const char *p;
and
char * const p;
a) You can't change the character in both
b) First : You can't change the characterr &
Second : You can;t change the pointer
c) You can't change the pointer in both
d) First : You can't change the pointer &
Second : You can't chanage the character
e) None
Ans) b (check it)

49) The redirection operators > and >>
a) do the same function
b) differ : > overwrites, while >> appends
c) differ : > is used for input while >> is used for output
d) differ : > write to any file while >> write only to standard output
e) None of these
Ans) b

50) The command grep first second third /usr/you/myfile
a) prints lines containing the words first, second or third from the file /usr/you/myfile
b) searches for lines containing the pattern first in the files second, third, and /usr/you/myfile and prints them
c) searches the files /usr/you/myfiel and third for lines containing the words first or second and prints them
d) replaces the word first with the word second in the files third and /usr/you/myfile
e) None of the above
Ans) b

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(PAPER) IBM Aptitude and Technical

IBM Aptitude and Technical (Paper)

Aptitude:

Part 1 : Letter sevies.
Part 2 : Figures
Part 3 : Quantitave

Technical:

Most question are on Unix and some in C and some in windows 3.1, all question in Unix are From Kernighan & pike

TISL (Part 1)

It consists of number series. In some institutes alphabetical series is given instead of number series. I am having number series so i am sending that. Please go through that alphabetical tests also.

1. 19,24,20,25,21,26,?   ans : 22
2. 11,14,12,15,13,16,?   ans : 14
3. 10,2,8,2,6,2,?   ans : 4
4. 8,9,11,14,,18,23,?   ans : 29
5. 25,25,22,22,19,19,?   ans : 16
6. 14,2,12,4,10,6,?   ans : 8
7. 7,16,9,15,11,14,?   ans : 13
8. 40,42,39,44,38,46,?   ans : 37
9. 3,18,4,24,5,30,?   ans : 6
10. 18,20,22,20,28,20,?   ans : 22
11. 18,20,10,12,4,6?   ans : 0
12. 7,6,8,5,3,7,?   ans : 4
13 9,18,21,25,20,?   ans : 30
14 3,3,4,8,10,36,?   ans : 33
15.30,28,25,20,34,28,?   ans : 21
16. 4,8,16,32,64,128,?   ans : 256
17. 8,16,24,32,40,48,?   ans : 56
18. 13,11,14,12,15,13,?   ans : 16
19. 6,18,36,108,216,648,?   ans : 1296
20. 4,4,8,8,16,16,?   ans : 32
21. 2,6,18,54,162,486,?   ans : 1458
22. 4,20,35,49,62,74,?   ans : 85
23. 10,18,15,23,20,28,?   ans : 25
24. 4,10,8,14,12,18,?   ans : 16
25. 10,15,12,17,14,10,?   ans : 16

Part 2 consists of non-verbel reasoning(figures).So it is impossible for me to send those.(25 questions)
Part 3 (quantitative)

1.A clerk multiplied a number by ten when it should have been divided by ten.The ans he got was 100.what should the ans have been?
Ans :1

2.If Rs20/- is available to pay for typing a research report & typist A   roduces 42 pages and typist B produces 28 pages.How much should typist A receive?
Ans :Rs12/-

3.The average salary of 3 workers is 95 Rs. per week. If one earns Rs.115 and second earns Rs.65 how much is the salary of the 3rd worker.
Ans.105.

4.A 16 stored building has 12000 sq.feet on each floor. Company A rents 7 floors and company B rents 4 floors. What is the number of sq.feet of unrented floor space.
Ans.60000

5. During a given week A programer spends 1/4 of his time preparing flow chart, 3/8 of his time coding and the rest of the time in debugging the programs. If he works 48 hours during the week , how many hours did he spend debugging the program.
Ans. 18.

6. A company installed 36 machines at the beginning of the year. In March they installed 9 additional machines and then disconnected 18 in August. How many were still installed at the end of the year.
Ans. 27

7. A man owns 2/3 of the market research beauro business and sells 3/4 of his shares for

Rs. 75000. What is the value of Business.
Ans.150000

8. If 12 file cabinets require 18 feet of wall space, how many feet of wall space will 30 cabinets require?
Ans.45

9.A computer printer produced 176,400 lines in a given day. If the printer was in operation for seven hours during the day, how many lines did it print per minute?
Ans.420

10. From its total income, A sales company spent Rs.20,000 for advertising, half of the remainder on commissions and had Rs.6000 left. What was its total income?
Ans.32000

11. On Monday a banker processed a batch of cheques, on Tuesday she processed three times as many, and on Wednesday she processed 4000 cheques. In the three days, she processed 16000 cheques. How many did she process on Tuesday?
Ans.9000

12. The cost of four dozen proof machine ribbons and five dozen accouting machine ribbons was Rs.160/-. If one dozen accounting machine ribbons cost Rs.20/-, what is the cost of a dozen proof machine ribbons?
Ans.Rs.15

13. If a clerk can process 80 cheques in half an hour, how many cheques can she process in a seven and one half hour day?
Ans.1200

14. In a library, there are two racks with 40 books per rack. On a given dya, 30 books were issued. What fraction remained in the racks?
Ans.5/8

15. The average length of three tapes is 6800 feet. None of the tapes is less than 6400 feet. What is the greatest possible length of one of the other tapes?
Ans.7600

16. A company rented a machine for Rs.700/- a month. Five years later the treasurer calculated that if the company had purchased the machine and paid Rs.100/- monthly maintenance charge, the company would have saved Rs.2000/-. What was the purchase price of the machine?
Ans.Rs.34000

17. Two computers each produced 48000 public utility bills in a day. One computer printed bills at the rate of 9600 an hour and the other at the rate of 7800 an hour. When the first computer finished its run, how many bills did the other computer still have to print?
Ans.9000

18. If a salesman's average is a new order every other week, he will break the office record of the year. However, after 28 weeks, he is six orders behind schedule. In what proportion of the remaining weeks does he have to obtain a new order to break the record?
Ans.3/4

19. On a given day, a bank had 16000 cheques returned by customers. Inspection of the first 800 cheques indicated that 100 of those 800 had errors and were therefore the available immediately for data processing. On this basis, hwo many cheques would be available immediately for data processing on that day?
Ans.14000

20. A company figured it needed 37.8 sq.feet of carpot for its reception room. To allow for waste, it decided to order 20% more material than needed. Fractional parts of sq.feet cannot be ordered. At Rs.9/- a sq.feet, how much would the carpet cost?

Ans. a. Rs.324   b) Rs.405   c) Rs.410   d) Rs.414   e) Rs.685

21. A tape manufacturer reduces the price of his heavy duty tape from Rs.30/- to Rs.28/- a reel and the price of a regular tape from Rs.24/- to Rs.23/- a reel. A computing centre normally spends Rs.1440/- a month for tapes and 3/4 of this is for heavy duty tapes. How much will they save a month under the new prices?
Ans.Rs.87

22. In a team of 12 persons, 1/3 are women and 2/3 are men. To obtain a team with 20% women how many men should be hired?
Ans.8

23. The dimensions of a certain machine are 48" X 30" X 52". If the size of the machine is increased proportionately until the sum of its dimensions equals 156", what will be the increase in the shortest side?
Ans. 6"

24. In a certain company, 20% of the men and 40% of the women attended the annual company picnic. If 35% of all the employees are man, what percent of all the employees went to the picnic?
Ans.33%

25. It cost a college Rs.0.70 a copy to produce a Programme for the homecoming football game. If Rs.15,000/- was received for advertisements in the programme, how many copies at Rs.0.50 a copy must be sold to make a profit of Rs.8000/- ?
Ans. 35000

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(PAPER) Paper i2 Technologies

(Paper) i2 Technologies)

This is given for 20 marks......
Simply try to solve it.

Write A Program In C++(Or in C) for the following Data--20 MIN.

A school Trust That manages many schools in a city has decided to merge two of its branches by moving all the students of different standards and divisions from both the branches to their newly acquired complex.How ever,when moving,it is ensured that every student's standard and division remains same. Thus a student of 7F (standard 7,division F)from one of the branches will continue to be in 7F in the new school complex. Given that the student strength of both the branches in the form of a list of division and strength pairs terminated by a $ sign as shown in the example as follows.....

```
1A 30 1B 28 2A 35
2B 38 2C 36 2D 34
3A 32 3B 34 ---$
1A 25 1B 24 1C 26
1D 25 1E 22 2A 40 2B 42
```

3A 35........
$

Write a program to read the above data and output the student strength of the new larger school in the same format.

Your Program

1) Must not assume any limit on the no. of divisions or classes in schools.
2) Must not output divisions with 0 strength.
3) Must use dynamic structures.

GLAT (Google Labs Aptitude Test)

1. Solve this cryptic equation, realizing of course that values for M and E could be interchanged. No leading zeros are allowed.

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This can be solved through systematic application of logic. For example, cannot be equal to 0, since . That would make , but , which is not possible.

Here is a slow brute-force method of solution that takes a few minutes on a relatively fast machine:

This gives the two solutions

777589 - 188106 == 589483
777589 - 188103 == 589486

Here is another solution using Mathematica's Reduce command:

A faster (but slightly more obscure) piece of code is the following:

Faster still using the same approach (and requiring ~300 MB of memory):

Even faster using the same approach (that does not exclude leading zeros in the solution, but that can easily be weeded out at the end):

Here is an independent solution method that uses branch-and-prune techniques:

And the winner for overall fastest:

2. Write a haiku describing possible methods for predicting search traffic seasonality.

MathWorld's search engine
seemed slowed this May. Undergrads
prepping for finals.

3.

1
1 1
2 1
1 2 1 1
1 1 1 2 2 1
What's the next line?

312211. This is the "look and say" sequence in which each term after the first describes the previous term: one 1 (11); two 1s (21); one 2 and one 1 (1211); one 1, one 2, and two 1's (111221); and so

on. See the look and say sequence entry on MathWorld for a complete write-up and the algebraic form of a fascinating related quantity known as Conway's constant.

4. You are in a maze of twisty little passages, all alike. There is a dusty laptop here with a weak wireless connection. There are dull, lifeless gnomes strolling around. What dost thou do?

A) Wander aimlessly, bumping into obstacles until you are eaten by a grue.
B) Use the laptop as a digging device to tunnel to the next level.
C) Play MPoRPG until the battery dies along with your hopes.
D) Use the computer to map the nodes of the maze and discover an exit path.
E) Email your resume to Google, tell the lead gnome you quit and find yourself in whole different world [sic].

In general, make a state diagram . However, this method would not work in certain pathological cases such as, say, a fractal maze. For an example of this and commentary, see Ed Pegg's column about state diagrams and mazes .

5. What's broken with Unix?

Their reproductive capabilities.

How would you fix it?

[This exercise is left to the reader.]

6. On your first day at Google, you discover that your cubicle mate wrote the textbook you used as a primary resource in your first year of graduate school. Do you:

A) Fawn obsequiously and ask if you can have an autograph.
B) Sit perfectly still and use only soft keystrokes to avoid disturbing her concentration
C) Leave her daily offerings of granola and English toffee from the food bins.
D) Quote your favorite formula from the textbook and explain how it's now your mantra.
E) Show her how example 17b could have been solved with 34 fewer lines of code.

[This exercise is left to the reader.]

7. Which of the following expresses Google's over-arching philosophy?

A) "I'm feeling lucky"
B) "Don't be evil"
C) "Oh, I already fixed that"
D) "You should never be more than 50 feet from food"
E) All of the above

[This exercise is left to the reader.]

8. How many different ways can you color an icosahedron with one of three colors on each face?

For an asymmetric 20-sided solid, there are possible 3-colorings . For a symmetric 20-sided object, the Polya enumeration theorem can be used to obtain the number of distinct colorings. Here is a concise Mathematica implementation:

What colors would you choose?

[This exercise is left to the reader.]

9. This space left intentionally blank. Please fill it with something that improves upon

emptiness.

For nearly 10,000 images of mathematical functions, see The Wolfram Functions Site visualization gallery .

10. On an infinite, two-dimensional, rectangular lattice of 1-ohm resistors, what is the resistance between two nodes that are a knight's move away?

This problem is discussed in J. Cserti's 1999 arXiv preprint . It is also discussed in The Mathematica GuideBook for Symbolics, the forthcoming fourth volume in Michael Trott's GuideBook series, the first two of which were published just last week by Springer-Verlag. The contents for all four GuideBooks, including the two not yet published, are available on the DVD distributed with the first two GuideBooks.

11. It's 2PM on a sunny Sunday afternoon in the Bay Area. You're minutes from the Pacific Ocean, redwood forest hiking trails and world class cultural attractions. What do you do?

[This exercise is left to the reader.]

12. In your opinion, what is the most beautiful math equation ever derived?

There are obviously many candidates. The following list gives ten of the authors' favorites:

1. Archimedes' recurrence formula : , , ,
2. Euler formula :
3. Euler-Mascheroni constant :
4. Riemann hypothesis: and implies
5. Gaussian integral :
6. Ramanujan's prime product formula:
7. Zeta-regularized product :
8. Mandelbrot set recursion:
9. BBP formula :
10. Cauchy integral formula:

An excellent paper discussing the most beautiful equations in physics is Daniel Z. Freedman's " Some beautiful equations of mathematical physics ." Note that the physics view on beauty in equations is less uniform than the mathematical one. To quote the not-necessarily-standard view of theoretical physicist P.A.M. Dirac, "It is more important to have beauty in one's equations than to have them fit experiment."

13. Which of the following is NOT an actual interest group formed by Google employees?

A. Women's basketball
B. Buffy fans
C. Cricketeers
D. Nobel winners
E. Wine club

[This exercise is left to the reader.]

14. What will be the next great improvement in search technology?

Semantic searching of mathematical formulas. See http://functions.wolfram.com/About/ourvision.html for work currently underway at Wolfram Research that will be made available in the near future.

15. What is the optimal size of a project team, above which additional members do not contribute productivity equivalent to the percentage increase in the staff size?

A) 1

B) 3
C) 5
D) 11
E) 24

[This exercise is left to the reader.]

16. Given a triangle ABC, how would you use only a compass and straight edge to find a point P such that triangles ABP, ACP and BCP have equal perimeters? (Assume that ABC is constructed so that a solution does exist.)

This is the isoperimetric point , which is at the center of the larger Soddy circle. It is related to Apollonius' problem . The three tangent circles are easy to construct: The circle around has diameter , which gives the other two circles. A summary of compass and straightedge constructions for the outer Soddy circle can be found in " Apollonius' Problem: A Study of Solutions and Their Connections" by David Gisch and Jason M. Ribando.

17. Consider a function which, for a given whole number n, returns the number of ones required when writing out all numbers between 0 and n.
For example, f(13)=6. Notice that f(1)=1. What is the next largest n such that f(n)=n?

The following Mathematica code computes the difference between [the cumulative number of 1s in the positive integers up to n] and [the value of n itself] as n ranges from 1 to 500,000:

The solution to the problem is then the first position greater than the first at which data equals 0:

which are the first few terms of sequence A014778 in the On-Line Encyclopedia of Integer Sequences.

Checking by hand confirms that the numbers from 1 to 199981 contain a total of 199981 1s:

18. What is the coolest hack you've ever written?

While there is no "correct" answer, a nice hack for solving the first problem in the SIAM hundred-dollar, hundred-digit challenge can be achieved by converting the limit into the strongly divergent series:

and then using Mathematica's numerical function SequenceLimit to trivially get the correct answer (to six digits),

You must tweak parameters a bit or write your own sequence limit to get all 10 digits.

[Other hacks are left to the reader.]

19. 'Tis known in refined company, that choosing K things out of N can be done in ways as many as choosing N minus K from N: I pick K, you the remaining.

This simply states the binomial coefficient identity .

Find though a cooler bijection, where you show a knack uncanny, of making your choices contain all K of mine. Oh, for pedantry: let K be no more than half N.

'Tis more problematic to disentangle semantic meaning precise from the this paragraph of verbiage peculiar.

20. What number comes next in the sequence: 10, 9, 60, 90, 70, 66, ?

A) 96
B) 100000000000000000000000000000000000\
00000000000000000000000000000000000\

00000000000000000000000000000000
C) Either of the above
D) None of the above

This can be looked up and found to be sequence A052196 in the On-Line Encyclopedia of Integer Sequences, which gives the largest positive integer whose English name has n letters. For example, the first few terms are ten, nine, sixty, ninety, seventy, sixty-six, ninety-six, ?. A more correct sequence might be ten, nine, sixty, googol, seventy, sixty-six, ninety-six, googolplex. And also note, incidentally, that the correct spelling of the mathematical term " googol" differs from the name of the company that made up this aptitude test.

The first few can be computed using the NumberName function in Eric Weisstein's MathWorld packages:

A mathematical solution could also be found by fitting a Lagrange interpolating polynomial to the six known terms and extrapolating:

21. In 29 words or fewer, describe what you would strive to accomplish if you worked at Google Labs.