English

For questions 1-5, read the passage carefully select the most appropriate answer:

And finally, Pierre and Marie lured out the secret – two secrets. For instead of one, they found two new elements – a substance which they named polonium after Marie's native country, and another substance which they called radium.

The nature of polonium was amazing enough. Its radioactivity was ever so much more powerful that than of uranium. But the nature of radium was the eighth great wonder of the world. Its power of radiation was found to exceed that of uranium by one and a half million per cent.

It was customary for the recipients of the Nobel Prize to call for it in person at Stockholm. But the Curies were unable to make the journey. They were too ill. Quietly, modestly, humbly, they went on with their work – with their privations. They spent all the money on their further experiments and remained gloriously forgetful of their personal interests. When the therapeutic value of radium was established – it had been found effective, among other things, in the treatment of cancer, their friends urged upon them the necessity of patenting the process of extracting radium. To do so would have meant considerable wealth to the Curies, since radium was valued at $150,000 a gram. But they refused to derive any income from their discovery. "Radium is an instrument of mercy and it belongs to the world," they said.

They refused not only profits but honours as well. All they asked of the world was to give them a good workroom for their experiments. When the Dean of the Sorbonne wrote to Pierre that the minister had proposed his name for the Legion of Honour, Pierre – seconded by Marie – replied as follows: "Please be so kind enough to thank the Minister and to inform him that I do not feel the slightest need of being decorated, but that I am in the greatest need of a laboratory."

1. It can be inferred from the passage that

A. Scientists need honours to discover new things
B. Scientists don't bother about honours
C. Scientists need encouragement and infrastructure
D. Scientists tend to suffer in life
E. None of the other given options

Answer: Option C

2. As used in the 3rd paragraph of the passage, what is the meaning of "privation"?

A. Something personal
B. To keep to oneself
C. To feel sorry about oneself

D. Lack of basic necessities
E. None of the other given options

Answer: Option D

3. What is the unique feature of radium?

A. It got the Curies their Noble Prize
B. It was discovered by the Curies
C. It is very expensive
D. It was discovered accidentally
E. None of the other given options

Answer: Option E

4. The Curies did not go to Stockholm because

A. They had no money
B. They were ill
C. They had no time from their experiments
D. They did not care much about winning the Noble Prize
E. None of the other given options

Answer: Option C

5. The Curies did not think the French honour important because

A. They had been neglected by the French earlier
B. They were ill
C. They were arrogant
D. They were more interested in a laboratory
E. None of the other given options

Answer: Option D

6. Choose which of the options given to you coherently arranges the following statements into a cogent and logical order, forming a paragraph by itself.

1. And only in the 19th century we find the meaning which eventually became the most common modern use: a feeling of concern or curiosity about something. *What are your interests?*

2. It started life in English in the 15th century as a legal expression; if you have *an interest in an estate*, you have a right or claim to some of it.
3. Subsequently, more general senses emerged like when people say they *have our interests at heart*, they mean our good or when politicians say *It's in your interest to vote for me*, they mean our advantage.
4. Later in the 16th century it developed a financial sense; if you hold *an interest in a company*, you have a financial stake in it.
5. *Interest* is one of those words where you have to look carefully at the context to see what is meant.

A. 3 – 2 – 5 – 4 – 1.
B. 5 – 2 – 4 – 3 – 1.
C. 1 – 3 – 4 – 2 – 5.
D. 5 – 1 – 4 – 3 – 2.
E. None of the other given options

Answer: Option B

7. Which one of the following is not an English word?

A. Rankle
B. Gritty
C. Scowl
D. Crittle
E. None of the other given options

Answer: Option D

8. Choose which of the following options replaces the blanks most coherently.

England and Wales face a/an..... of 256,000 new school places by next year, and the Department for Education has little understanding of where ..... classes are needed or how much they will cost, according to a new report.

A. Explosion.....Increased
B. Need.....Sufficient
C. Shortfall.....Additional
D. Decline…….proper
E. None of the other given options

Answer: Option A

9. Choose which of the following options replaces the blanks most coherently.

Once the Mughals, the British bureaucracy and India's feudal aristocracy .....the hunting of animals to be the ultimate symbol of manhood and ....., it was only a matter of time before several species became extinct.

A. Set up.....Charity
B. Established ..... Nobility
C. Called……Strength
D. Urged.....Beauty
E. None of the other given options

Answer: Option C

10. Everyone complained…… the awful food.

A. about
B. for
C. on
D. over
E. none of the other given options

Answer: Option A

11. It is late. How much longer are you going to……. working?

A. along
B. on
C. through
D. with
E. None of the above.

Answer: Option E

12. There's a mistake ……. page 120.

A. at
B. in
C. on
D. of
E. none of the other given options

Answer: Option C

MSc IT Entrance Examination - Sample Question Paper

C Programming

1. **What is the output of the following C code?**

```
#include <stdio.h>
int main()
{
        int ary[2][3];
        ary[][] = {{1, 2, 3}, {4, 5, 6}};
        printf("%d\n", ary[1][0]);
}
```

a) Compile time error

b) 4

c) 1

d) 2

e) None of the above

Answer: (a)

2. **What is the output of this C code?**

```
#include <stdio.h>
void main()
{
   int a[2][3] = {1, 2, 3, , 4, 5};
   int i = 0, j = 0;
   for (i = 0; i < 2; i++)
   for (j = 0; j < 3; j++)
   printf("%d", a[i][j]);
}
```

f) 1 2 3 junk 4 5

g) Compile time error

h) 1 2 3 0 4 5

i) 1 2 3 3 4 5

j) None of the above

Answer: (b)

3. **What is the output of this C code?**

```
#include <stdio.h>
void main()
{
   #define max 37;
   printf("%d", max);
}
```

a) 37
b) Compile time error
c) Varies
d) Depends on compiler
e) None of the above

Answer: (b)

4. **What is the output of this C code?**

```
#include <stdio.h>
int main()
{
   const int p;
   p = 4;
   printf("p is %d", p);
   return 0;
}
```

a) p is 4
b) Compile time error
c) Run time error
d) p is followed by a garbage value
e) None of the above

Answer: (b)

Explanation: Since the constant variable has to be declared and defined at the same time, not doing it results in an error.

5. **The equivalent pointer expression by using the array element a[i][j][k][2],**

   a) ((((a+m)+n)+o)+p)

   b) *(*(*(*(a+i)+j)+k)+2)

   c) *((((a+m)+n)+o+p)

   d) *(((a+m)+n+o+p)

   e) None of the above

   Answer: (b)

6. **The given below program allocates the memory, what function will you use to free the allocated memory?**

```
#include<stdio.h>
#include<stdlib.h>

#define MAXROW 4
# define MAXCOL 5

int main ()
{
  int **p, i, j

  p = (int **) malloc(MAXROW * sizeof(int*));
  return 0;
}
```

   a) memfree(int p);

   b) free(p);

   c) dealloc(p);

   d) Both, free(p); & dealloc(p);

   e) None of the above

   Answer: (b)

7. How many times the given below program will print "India"?

```
#include<stdio.h>

int main ()
{
  int x;

  for(x=-1; x<=20; x++)int i;
  {
  if(x < 10)
     continue;
  else
     break;
  printf("India");
}
```

a) Unlimited times

b) 21 times

c) 0 times

d) 20 times

e) None of the above

Answer: (c)

8. What do you mean by "int (*ptr)[10]"

a) ptr is an array of pointers to 10 integers

b) ptr is a pointer to an array of 10 integers

c) ptr is an array of 10 integers

d) Invalid statement

e) None of the above

Answer: (b)

9. The binary equivalent of 50 is,

a) 110010

b) 1010110

c) 101

d) 101.011.00.00

e) None of the above

Answer: (a)

10. Choose the correct statement that can retrieve the remainder of the division 5.5 by 1.3?

a) rem = modf(5.5 % 1.3)

b) rem = modf(5.5, 1.3)

c) rem = fmod(5.5, 1.3)

d) rem = f(5.5, 1.3)

e) None of the above

Answer: (c)

11. What is the output of this C code?

```
#include <stdio.h>
    int main()
    {
       int *p = NULL;
       for (foo(); p; p = 0)
          printf("In for loop\n");
          printf("After loop\n");
    }
```

a) In for loop after loop

b) Compile time error

c) Infinite loop

d) Depends on the value of NULL

e) None of the above

Answer: (b)

12. What is the output of this C code?

```
#include <stdio.h>
int x = 5;
void main()
{
   int x = 3;
   printf("%d", x);
   {
      int x = 4;
   }
   printf("%d", x);
}
```

a) 3 3
b) 3 4
c) 3 5
d) Run time error
e) None of the above

Answer: (a)

13. In the given below code, the function fopen()uses "r" to open the file “source.txt” in binary mode for which purpose?

```
#include<stdio.h>

int main ()
{
  FILE *fp;

  fp = fopen("source.txt", "r");
  return 0;
}
```

a) For reading

b) For reading and writing

c) For creating a new file "source.txt" for reading

d) For creating a new file "source.txt" for writing

e) None of the above

Answer: (a)

14. To print a double value which format specifier can be used?

a) %L

b) %lf

c) %Lf

d) %f

e) None of the above

Answer: (b)

15. What is the output of the following program?

```
#include<stdio.h>

main ()

{
  static int i = 1;

  if(i--) {

  printf("%d ",i);

  main();

 }

}
```

a) 0

b) 0 infinite

c) Programs hangs with stack overflow

d) Compile error

e) None of the above

Answer: (a)

16. In the given below code, what will be the value of a variable x?

```
#include<stdio.h>

int main()
{
  int y = 100;
  const int x = y;

  printf("%d\n", x);
  return 0;
}
```

a) 100

b) 0

c) Compile Time Error

d) Runtime Error

e) None of the above

Answer: (a)

17. Which statement can print \n on the screen?

a) printf("\\n");

b) printf("n\");

c) printf("n");

d) printf('\n');

e) None of the above

Answer: (a)

18. Which of the following are unary operators in C?

1. !
2. Sizeof
3. ~
4. &&

a) 1,2
b) 1,3
c) 2,4
d) 1,2,3

Answer: (d)

MSc IT Entrance Examination - Sample Question Paper

Quantitative Aptitude and Logical Reasoning

1. If today is Thursday. What would be the day of the week after exactly 60 days?

A. Saturday
B. Sunday
C. Monday
D. Tuesday
E. None of the above

Answer: Option C
Explanation:
60 days = 8 weeks 4 days = 4 odd days
Hence if today is Thursday, After 60 days, it will be = (Thursday + 4 odd days) = Monday

2. A work can be finished in 16 days by twenty women. The same work can be finished in fifteen days by sixteen men. The ratio between the capacity of a man and a woman is

A. 1 : 3
B. 4 : 3
C. 2 : 3
D. 2 : 1
E. None of the given options

Answer: Option **B**
Explanation:
Work done by 20 women in 1 day = 1/16
Work done by 1 woman in 1 day = 1/(16×20)

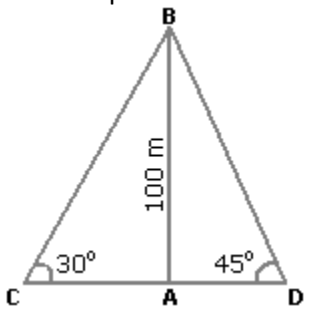
Work done by 16 men in 1 day = 1/15
Work done by 1 man in 1 day = 1/(15×16)

Ratio of the capacity of a man and woman =1/(15×16) : 1/(16×20) = 1/15 : 1/20
= 1/3 :1/4 = 4:3

3. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:

A. 173 m
B. 200 m
C. 273 m
D. 300 m
E. None of the above.

Answer: Option **C**
Explanation:
Let AB be the lighthouse and C and D be the positions of the ships.



Then, AB = 100 m, $\angle$ACB = 30° and $\angle$ADB = 45°.

$\frac{AB}{AC} = \tan 30° = \frac{1}{3} \Rightarrow$ AC = AB x 3 = 1003 m.

$\frac{AB}{AD} = \tan 45° = 1 \Rightarrow$ AD = AB = 100 m.

$\therefore$ CD = (AC + AD) = (1003 + 100) m

= 100(3 + 1)

= (100 x 2.73) m

= 273 m.

4. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in 1 and 1/3 hours, it must travel at a speed of

A. 360 kmph.
B. 480 kmph.
C. 600 kmph.
D. 720 kmph.
E. None of these.

Answer: Option **D**
Explanation:
Distance = (240 x 5) = 1200 km.
Speed = Distance/Time
Speed = 1200/(5/3) km/hr. [We can write 1 and 1/3 hours as 5/3 hours]

Required speed = $\left(1200 \times \frac{3}{5}\right)$ = 720 kmph

5. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of the flight was:

A. 1 hour
B. 2 hours
C. 3 hours
D. 4 hours
E. None of these

Answer: Option **A**
Explanation:
Let the duration of the flight be D hours.
Then (600/D) – (600/(D+(1/2))) = 200
(600/D) – (1200/(2D +1)) = 200
D (2D + 1) = 3
⇨ $2D^2 + D – 3 = 0$
⇨ (2D + 3) (D – 1) = 0
⇨ D = 1 hour.

6. Three numbers are in the ratio of 2 : 3 : 4 and their L.C.M. is 240. Their H.C.F. is:

A. 40
B. 30
C. 20
D. 10
E. None of these

Answer: Option C
Explanation:
Let the numbers be 2x, 3x and 4x

LCM of 2x, 3x and 4x = 12x
12 x = 240
⇨ x = 20
HCF of 2x, 3x and 4x is x = 20

7. Find the statement that must be true according to the given information.
On weekends, Mr. Desai spends many hours working in his vegetable and flower gardens. Mrs. Desai spends her free time reading and listening to classical music. Both Mr. Desai and Mrs. Desai like to cook.

A. Mr. Desai enjoys planting and growing vegetables.
B. Mr. Desai does not like classical music.

C. Mrs. Desai cooks the vegetables that Mr. Desai grows.
D. Mrs. Desai enjoys reading nineteenth century novels.
E. None of the above.

Answer: Option **A**
Explanation:
Because Mr. Desai spends many hours during the weekend working in his vegetable garden, it is reasonable to suggest that he enjoys this work. There is no information to suggest that he does not like classical music. Although Mrs. Desai likes to cook, there is nothing that indicates she cooks vegetables (choice c). Mrs. Desai likes to read, but there is no information regarding the types of books she reads (choice d).

8. Given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusion and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

Statement 1: Some doctors are fools.
Statement 2: Some fools are rich.

Conclusion I: Some doctors are rich.
Conclusion II: Some rich are doctors.

A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. None of the above.

Answer: Option **D**
Explanation:
Since both the premises are particular, no definite conclusion follows.

9. Given two statements followed by four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance from the commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Statement 1: All branches are flowers.
Statement 2: All flowers are leaves.

Conclusion I: All branches are leaves.
Conclusion II: All leaves are branches.
Conclusion III: All flowers are branches.
Conclusion IV: Some leaves are branches.

a. All follow.
b. Only I and IV follow.
c. Only II and III follow.
d. Only I and III follow
e. None of the above.

Answer: Option **B**
Explanation:
Since both the premises are universal and affirmative, the conclusion must be universal affirmative and should not contain the middle term. So, it follows that 'All branches are leaves'. Thus, I follows. IV is the converse of this conclusion and so it also holds.

10. Given three statements followed by three conclusions numbered I, II and III, You have to take the given statements to be true even if they seem to be at variance from the commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Statement 1: Some hills are rivers.
Statement 2: Some rivers are deserts.
Statement 3: All deserts are roads.

Conclusion I: Some roads are rivers.
Conclusion II: Some roads are hills.
Conclusion III: Some deserts are hills.

a. All follow.
b. Only I follows.
c. Only I and II follow.
d. Only II and III follow
e. None of the above.

Answer: Option **B**
Explanation:

Some hills are rivers. Some rivers are deserts.

Since both the premises are particular, no definite conclusion follows.

Some rivers are deserts. All deserts are roads.

Since one premise is particular, the conclusion must be particular and shouldn't contain the middle term. So, it follows that 'Some rivers are roads'. I is the converse of this conclusion and so it holds.

Some hills are rivers. Some rivers are roads.

Again, since both the premises are particular, no definite conclusion follows.

11. Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?
    a. (1/3).

b. (1/8).
c. (2/8).
d. (1/16)
e. None of the above

Answer: Option **B**
Explanation:

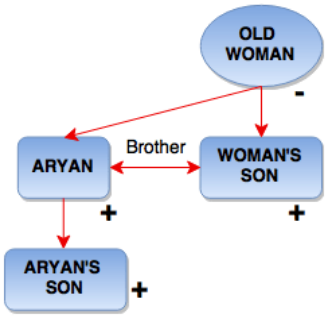
This is a simple division series; each number is one-half of the previous number.

In other terms to say, the number is divided by 2 successively to get the next result.

4/2 = 2
2/2 = 1
1/2 = 1/2
(1/2)/2 = 1/4
(1/4)/2 = 1/8 and so on.

12. Pointing to an old woman, Aryan said ''Her son is my son's uncle."
How is Aryan related to old woman?
    a. Father.
    b. Brother.
    c. Son.
    d. Grandson.
    e. None of the above.

Answer: Option **C**
Explanation:



Mathematics

1. Which of the following quadradic functions of x cannot be factored into two linear functions of x, with real coefficients:

   (a) $x^2 - 5x + 53$
   (b) $x^2 - 2x + 1$
   (c) $x^2 + 2x + 1$
   (d) $x^2 - 5x - 53$
   (e) none of the others
   (f) Answer (a)

2. Which of the following is the largest number (among those listed)?

   (a) $\log_2 7$
   (b) $\log_5 11$
   (c) $\log_3 74$
   (d) $\log_2 70$
   (e) none of the above
   (f) Answer (d)

3. The number of points of intersection between the two curves $y = x^2 + 15x - 1225$ and $x = y^2 - 30y + 225$ is

   (a) 1
   (b) 2
   (c) 3
   (d) 4
   (e) None of the above
   (f) Answer (b)

4. For positive integers written in decimal system, which of the following least significant digit (right most digit) values guarantees that the number is not a prime number?

   (a) 1
   (b) 3
   (c) 7
   (d) 9
   (e) None of the above
   (f) Answer (e)

5. Which of the following finite sequences is in harmonic progression?

   (a) $1, 2, 3, 4, 5, 6$

(b) $1, 2, 4, 8, 16, 32$

(c) $120, 110, 100, 90$

(d) $20, 24, 30, 40, 60, 120$

(e) None of the above

(f) Answer (d)

6. Consider two finite sets A and B. Suppose we define an injective function from A to B (that is A is the domain and B the codomain of the function). Suppose we define a surjective function from B to A.

   (a) The cardinality of A is greater than the cardinality of B.

   (b) The cardinality of B is greater than the cardinality of A.

   (c) The larger set is at least twice as large as the smaller set.

   (d) The sets A and B have the same cardinality

   (e) None of the above.

   (f) Answer (d)

7. Consider the set $S = \{1, 2, 3, 4, 5\}$. The following is a relation

   $R : \{(1,1), (2,2), (3,3), (4,4), (5,5), (1,2), (1,3), (1,4), (1,5), (2,5), (3,5), (4,5)\}$

   defined on S.

   (a) R is an equivalence relation but not a partial order

   (b) R is a partial order but not an equivalence relation

   (c) R is both an equivalence relation and a partial order

   (d) R is neither an equivalence relation nor a partial order

   (e) None of the above

   (f) Answer (b)

8. Which of the following is impossible?

   (a) A function is neither continuous nor differentiable at some point in its domain of definition

   (b) A function is both continuous and differentiable at some point in its domain of definition

   (c) A function is continuous but not differentiable at some point in its domain of definition

   (d) A function is differentiable but not continuous at some point in its domain of definition

   (e) None of the above

   (f) Answer (d)

9. The number of terms in the expansion of $(x+y)^n$ for a positive integer n is

   (a) Always odd
   (b) Always even
   (c) Odd when n is odd and even when n is even
   (d) Odd when n is even and even when n is odd
   (e) None of the above
   (f) Answer (d)

10. Which of the following is the smallest (among those listed)?

   (a) $\log_2 11 + \log_2 15 + \log_2 23$
   (b) $\log_2 12 + \log_2 15 + \log_2 22$
   (c) $\log_2 13 + \log_2 15 + \log_2 21$
   (d) $\log_2 8 + \log_2 12 + \log_2 28$
   (e) None of the above
   (f) Answer (c)

11. The sum of 5 successive integers is a prime. Which of the following is the smallest of these five integers.

   (a) 1
   (b) 2
   (c) 3
   (d) 4
   (e) None of the above
   (f) Answer (e)

12. Consider two finite sets D and C. Let n_1 be the number of injective functions with domain D and codomain C and let n_2 be the number of surjective functions with domain D and codomain C. Assume $n_1 > n_2$, then

   (a) The number of bijective functions with domain D and codomain C is n_1.
   (b) The number of bijective functions with domain D and codomain C is zero
   (c) The number of bijective functions with domain D and codomain C is greater than n_2.
   (d) The number of bijective functions with domain D and codomain C is equal to $\frac{n_1+n_2}{2}$.

(e) None of the above

(f) Answer (b)

13. $\binom{50}{21} < \binom{50}{x}$. Then possible value of x is

(a) 28

(b) 29

(c) 30

(d) 31

(e) None of the above

(f) Answer (a)

14. Let $y = x^3$. The number of points at which $\frac{dy}{dx} < 0$ is:

(a) 1

(b) 2

(c) 3

(d) Infinitely many points

(e) None of the above

(f) Answer (e)

15. $\lim_{n\to\infty} \left(1 + \frac{1}{n}\right)^n$ takes value

(a) 0

(b) ∞

(c) e

(d) $\frac{1}{e}$

(e) None of the above

(f) Answer (c)

16. The ratio of two irrational numbers is

(a) Always rational

(b) Always irrational

(c) Not a real number

(d) Sometimes rational and sometimes irrational

(e) None of the above

(f) Answer (d)

17. The sum of k successive positive integers is a prime. Then the largest possible value of k is

(a) 1

(b) 2

(c) 3

(d) 4

(e) None of the above

(f) Answer (b)

18. The maximum value of $3x^3 + 2x^2 - x - 4$ in the interval $[3, 6]$ is

(a) 92

(b) 216

(c) 416

(d) 710

(e) None of the above

(f) Answer (d)