M.A/M.Sc in Computational Finance
Entrance Test 2010
Answer all questions

Full Marks :100 **Time : 2 hours**

Instructions:

1. Write down the answers to the questions in Part A(1-20) in the space provided below the question. Each of the questions in Part A carries 3 marks.
2. Choose the right alternative from among the given alternative for questions in Part B(21-30). Each of the questions in Part B carries 4 marks. For incorrect answer -1 mark will be awarded.

Part-A

1. A father tells his son, "I was of your present age, when you were born". If the sum of their present ages is 57 years, how old was the son four years back?
   Ans:

2. In what ratio tea costing Rs 60 per kg must be mixed with tea costing Rs. 40 per kg so that after selling the mixture at the rate of Rs. 80 per kg the profit would be 50%.
   Ans:

3. In a row of students Sarat is 10th from the left and Binod is 9th from the right. If they interchange their positions, Sarat becomes 15th from the left. How many students are there in the row ?
   Ans:

4. Six persons A, B, C, D, E and F are sitting around a round table in the following way:
   B is facing E ;
   A is not near D and F ;
   E is to the right of C ;
   F and B have one person between them.
   Who is facing F ?
   Ans:

5. In a group of children each child gives a gift to every other. If the number of gifts exchanged is 132, find the number of children.
   Ans:

6. P, Q, R, S and T reside in a five-story building. R and T do not reside on the ground floor. Q resides one story above P and one story below S. R does not reside on the top floor. How many of them reside above Q ?
   Ans:

7. What is the length of the largest pole that can be placed inside a hall 11 meter long, 9 meter wide and 5 meter in height ?
   Ans:

8. Cost price of 12 TV sets is equal to the selling price of the same 10 TV sets. How much percentage of profit the seller will gain?
   Ans:

9. What is the sum of first 3002 terms of the sequence

$$2, 3, 5, \quad 2, 3, 5, \quad 2, 3, 5, ...?$$

   Ans:

10. Ashok leaves school at the same time everyday. If he cycles at 20 km/h, he arrives home at 1.30 P.M and if he cycles at 10 km/h he arrives home at 2.15 P.M. At what speed in km/h must he cycles to arrive home at 2 P.M.
    Ans:

11. A pipe A can fill a tank in 2 hours and a pipe B can fill in 3 hours. The pipe C can empty it in 5 hours. If all the three pipes are opened for an empty tank, how many hours are needed to fill up the tank?
Ans:

12. A ball bounces to half of its previous height each time it hits a smooth surface. If the first height is h meters what is the total vertical distance traveled by the ball till it comes to rest.
Ans:

13. If the product of 1000 positive integers is 1000, what is their maximum sum?
Ans:

14. The digits $1, 2, ..., 9$ are placed around a circle is an arbitrary order. Reading clockwise three consecutive digits, one gets a three digit integer. There are nine such three digit integers. What is their sum?
Ans:

15. A solid cube of each side 4 cms has been painted red, blue and green on pairs of opposite faces. It is then cut into cubical blocks of each side 1 cm. How many cubes have only two faces painted?
Ans:

16. When questioned about the contents in his bag, a customer replied that there were all mangoes except 4, all apples except 6 and all oranges except 8. How many mangoes, apples and oranges he had ?
Ans:

17. For what value of k, the system of equations :
$x - 2y + z = 0, \quad kx - y + 2z = 0$ and $2x - y + z = 0$ has a nontrivial solution?
Ans:

18. How many three digit positive integers can be formed using the digits from the set $\{0, 1, 2, 3, 5\}$ without repetition of the digits in a number?
Ans:

19. An unbiased coin is tossed 4 times. What is the probability that the number of heads exceed the number of tails ?
Ans:

20. My watch always shows right time but has only hour hand and no minute hand. At the moment that this hour hand points directly to the 22 minutes mark, what is the exact time?
Ans:

Part-B

Put a $\surd$ in right answer.

21. Choose the statement that must be true according to the given information.

    On weekends, Mr. Sanchez spends many hours working in his vegetable and flower gardens. Mrs. Sanchez spends her free time reading and listening to classical music. Both Mr. Sanchez and Mrs. Sanchez like to cook.
    A. Mr. Sanchez enjoys planting and growing vegetables.
    B. Mr. Sanchez does not like classical music.
    C. Mrs. Sanchez cooks the vegetables that Mr.Sanchez grows.
    D. Mrs. Sanchez enjoys reading nineteenth century novels.

22. Choose the statement that must be true according to the given information.

    Seahorse populations have declined everywhere that seahorses are fished. During the past five years, seashores populations have decreased by 50%. Last year, biologists met to discuss what might be done to reverse this trend.
    A. Seahorse are likely to become extinct within five years.
    B. One way to increase seahorse populations is to ban the fishing of seahorses.
    C. Biologists from all over the world are working to save the seahorses.
    D. Seahorse fisherman have spoken out against the biologists.

23. Given the following statements 1 and 2 choose the correct alternative from A, B, C, D and E .
    1. The government has decided to give tax benefits for small savings for investments and benefit accurals.However, all withdrawals of such savings are to be taxed.
    2. People have been investing more in small savings than in equity market to avail maximum tax benefits.
    A. Statement I is the cause and statement II is its effect.
    B. Statement II is the cause and statement I is its effect.
    C. Both the statements I and II are independent causes.
    D. Both the statements I and II are effects of independent causes.
    E. Both the statements I and II are effects of some common cause.

24. Fact 1: All chickens are birds.
    Fact 2: Some chickens are hens.
    Fact 3: Female birds lay eggs.
    If the first three statements are facts, which of the following statements must also be a fact ?
    I: All birds lay eggs.
    II: Hens are birds.
    III: Some chickens are not hens.
    A. I only
    B. II only
    C. II and III only
    D. None of the statements is a known fact.

25. Fact 1: Jessica has four children.
Fact 2: Two of the children have blue eyes and two of the children have brown eyes.
Fact 3: half of the children are girls.
If the first three statements are facts, which of the following statements must also be a fact ?
I: At least one girl has blue eyes.
II: Two of the children are boys.
III: The boys have brown eyes.
A. I only
B. II only
C. II and III only
D. None of the statements is a known fact.

26. A jury reaches a verdict when all of its members have come to a unanimous agreement. In one recent well-publicized trial, the judge thought that the jury had reached a verdict. Eventually, it was learned that one juror had never been able to agree with the others. The proceeding was ultimately declared a mistrial by the judge.

Based only on the information above, which of the following statements is a valid conclusion?
A. The jury never actually reached a verdict.
B. The jury had reached a verdict but had been disrupted by a single juror.
C. There have been other trails in which the jury fails to reach a verdict.
D. Only trails in which the jury fails to reach a verdict are declared mistrials.
E. The judge's role is not as important as that of the individual jurors.

27. People should be held accountable for their own behavior, and if holding people accountable for their own behavior entails capital punishment, then so be it. However, no person should be held accountable for behavior over which he or she had no control.
Which of the following is the most logical conclusion of the argument above?
A. People should not be held accountable for the behavior of other people.
B. People have control over their own behavior.
C. People cannot control the behavior of other people.
D. Behavior that cannot be controlled should not be punished.
E. People have control over behavior that is subject to capital punishment.

28. Beautiful beaches attract people, no doubt about it. Just look at this city's beautiful beaches, which are among the most overcrowded beaches in the state.
Which of the following exhibits a pattern of reasoning most similar to the one exhibited in the argument above ?
A. Moose and bear usually appear at the same drinking hole at the same time of day. Therefore, moose and bear must grow thirsty at about the same time.
B. Children who are scolded severely tend to misbehave more often than other children. Hence if a child is not scolded severely that child is less likely to misbehave.
C. This software program helps increase the work efficiency of its users. As a result, these users have more free time for other activities.

D. During warm weather my dog suffers from fleas more so than during cooler weather. Therefore, fleas must thrive in a warm environment.
E. Pesticides are known to cause anemia in some people . However, most anemic people live in regions where pesticides are not commonly used.

29. Opening a plant in war-torn Country X is not inadvisable, despite what critics of the plan may say. Ten years ago we opened our plant in Country Y in the middle of a revolution; that plant has been generating successful profits ever since.

    Which of the following is the author of the argument above most reasonably intending the reader to conclude?
    A. Wars are profitable for the author's particular business.
    B. Country X is a more stable nation than Country Y.
    C. Critics of the proposed plant in Country Y are likely to be biased.
    D. The proposed plant in Country X will generate profits, despite war.
    E. The proposed plant in Country X will be more successful than in country Y .

30. Newspaper publishers earn their profits primarily from advertising revenue, and potential advertisers are more likely to advertise in newspapers with a wide circulation - a large number of subscribers and other readers-than with other newspapers. But the circulation of the newspaper that is currently the most profitable one in this city has steadily declined during the last two years, while the circulation of one of its competitors has steadily increased.
    Any of the following, if true, would help explain the apparent discrepancy between the two statements above EXCEPT:
    A. Advertisers generally switch from the most widely circulated newspaper to another one only when the other one becomes the most widely circulated newspaper instead.
    B. Advertising rates charged by the most profitable newspaper in the city are significantly higher than those charged by its competitors.
    C. The most profitable newspaper in the city receives revenue from its subscribers as well from advertisers.
    D. The circulation of the most profitable newspaper in the city is still greater than of any of its competitors.
    E. The number of newspaper competing viably with the most profitable newspaper in the city has increased during the last two years.

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