Indian School of Business
Advanced Management Programme in Business Analytics
Entrance Test
Duration: 2 hours

There are four parts in this test: Logical Reasoning, Data Interpretation, Probability and Descriptive Statistics each containing 10 objective type questions. For each question you are given 4 alternative answers, only one of which is correct. Tick the right answer. There is no negative marking.

Logical Reasoning

Q1. A salesman is carrying a big bag for selling a machine. In addition to the machine that the salesman wants to sell, there is some personal stuff. The weight of his machine is three kilogram and half a machine. In addition to the machine, there is a repair tool for the machine that weighs half kilogram and one-fourth of the machine. The personal stuff weighs four kilogram minus a fourth of the weight of the machine. Finally, the salesman has some supplies that weigh two-fifth of the machine and personal stuff combined. What is the total weight in the bag of salesman?

A. 9.87 Kg

B. 12.73 Kg

C. 15.12 Kg

D. 16.16 Kg

Q2.   x is a positive integer. k is the remainder when x^3 - x is divided by 3.

A.   K < 1
B.   k>1
C.   k=1
D.   Cannot be determined

Q3. The LCM of two numbers is 280 and their ratio is 7:8. The two numbers are

A. 70,80

B. 35,40

C. 42,48

D. 28,32

Information for questions 4-6

Please read the below information carefully to answer next three questions.

Eight friends P, Q, R, S, T, U, V and W decided to have a get-together party and met in a restaurant on one fine day. They sat around a circular dining table, facing the center. Each one of them has a different occupation, viz architect, banker, doctor, engineer, entrepreneur, pilot, politician, and professor.

The politician sat third to the right of V. R was an immediate neighbor of V. The architect sat second to the right of R. Q sat third to the right of W. W was neither a politician nor an architect. Only one person sat between R and the professor. P and U were immediate neighbors of each other. Neither P nor U was a politician. The doctor sat second to the right of P. Two people sat between S and the engineer. S was not a politician. The pilot was not an immediate neighbor of the politician. The banker sat second to the left of P.

Q4. Four of the following five were alike in a certain way based on the given seating arrangement and thus form a group. Which one does not belong to that group?

A.   W - Entrepreneur

B.   V - Doctor

C.   U - Architect

D.   T - Politician

E.   S - Pilot

Q5. What was the position of U with respect to the politician?

A.   Immediate right

B.   Second to the left

C.   Second to the right

D.   Third to the left

E.   Fourth to the left

Q6. Which of the following was true with respect to the given seating arrangement?

A.   S is an immediate neighbor of V.

B.   V is a banker.

C.   The banker and the professor are immediate neighbors of each other.

D.   The pilot sits exactly between the architect and the entrepreneur.

E.   The doctor sits second to the right of the entrepreneur.

Q7. Suresh and Mahesh set out together on their cars travelling at 21 and 18km per hour, respectively. After an hour and 20 minutes, Suresh stopped to fix a flat tire. It took Suresh two hours to fix the flat tire while Mahesh continued to drive during this time. How many hours will it take Suresh to catch up Mahesh assuming he resumes his ride at 21km per hour? (also assume that Suresh's acceleration/deceleration after/before the flat tire was negligible)
   A.   9 hours 40 minutes
   B.   10 hours 20 minutes
   C.   10 hours 40 minutes
   D.   11 hours 20 minutes
   E.   13 hours 20 minutes

Q8. The question below has three statements followed by two conclusions numbered I & II. You have to assume the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follow from the those three statements, disregarding commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows

       Give answer A If only Conclusion I follows
       Give answer B If only Conclusion II follows
       Give answer C If either Conclusion I or II follows
       Give answer D If both Conclusions I and II follows
       Give answer E If neither Conclusion I nor II follows

       Statements:
       Some roots are stems.
       All roots are branches.
       No branch is a leaf.

       Conclusions:
       I. All branches can never be roots.
       II. Some leaves being roots is a possibility.

Q9. Nikhil, Prakash, and Sandeep divided some money equally among themselves. They went to a coffee shop and ordered cappuccino. The cost of a cappuccino is Rs.80 and they paid the bill

individually. While leaving the restaurant, they realized that the money they were left with was equal to the money each had after the division. Find the original money they shared.

A) 380

B) 360

C) 340

D) 320

Q10. Find the remainder when 2^{31} is divided by 5.

A. 4

B. 5

C. 3

D. 7

Data Interpretation

Answer Q 1-5 based on the following pie charts. In year 2013, 9000 applicants enrolled for entrance exam for Master Program in Analytics in five different schools across the country. The pie chart below mentions the percentage of applicants who enrolled for the entrance exam for the program in a specific school.

Total Applicants Enrolled = 9000
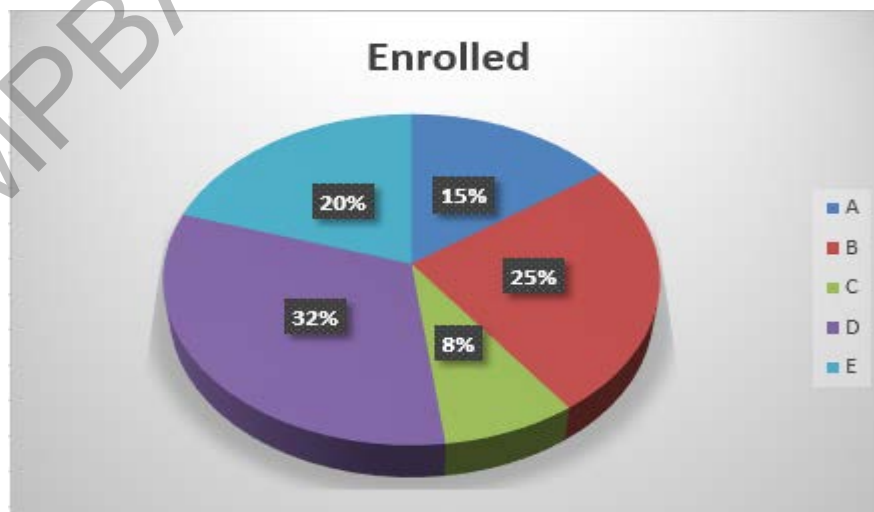
Out of the applicants who enrolled for the entrance exam in a specific school, the below mentioned pie chart specifies the percentage of applicants who successfully passed the entrance exam for that specific school. The total number of applicants that passed were 6500.

Total Applicants who passed = 6500
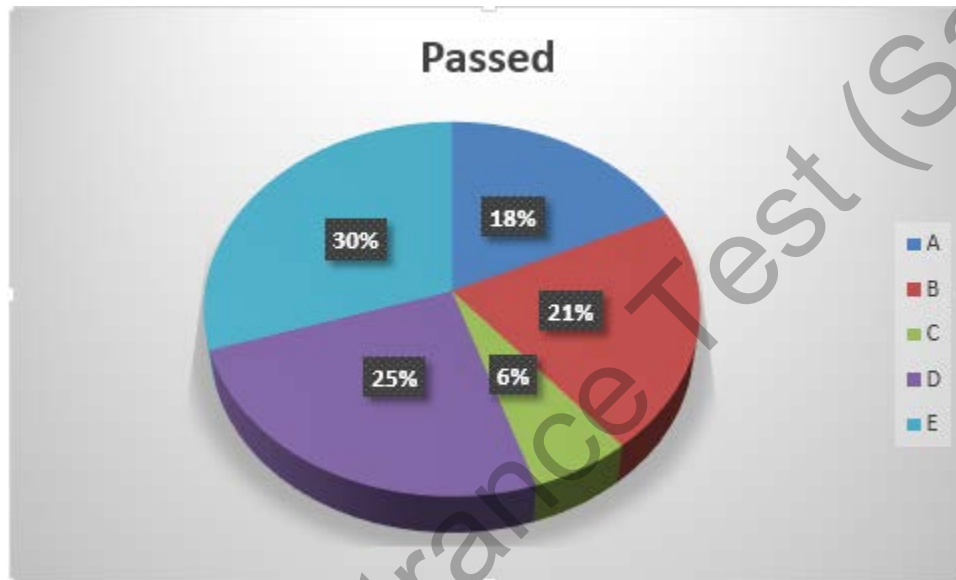
Q1. For which school, successfully passing an entrance test is toughest i.e. which school has the lowest ratio of applicants passed to applicants enrolled?
A. B
B. C
C. D
D. E

Q2. Approx ratio of applicants enrolled to applicants passed for school D is?
A. 52%
B. 61.2%
C. 67.7%
D. 75%

Q3. For schools A and B combined, percentage of applicants passed to those enrolled is?
A. 64.8%
B. 70.4%
C. 81%
D. 89%

Q4. Out of the applicants enrolled for school E, what is the percentage of applicants who passed the test for the same school?
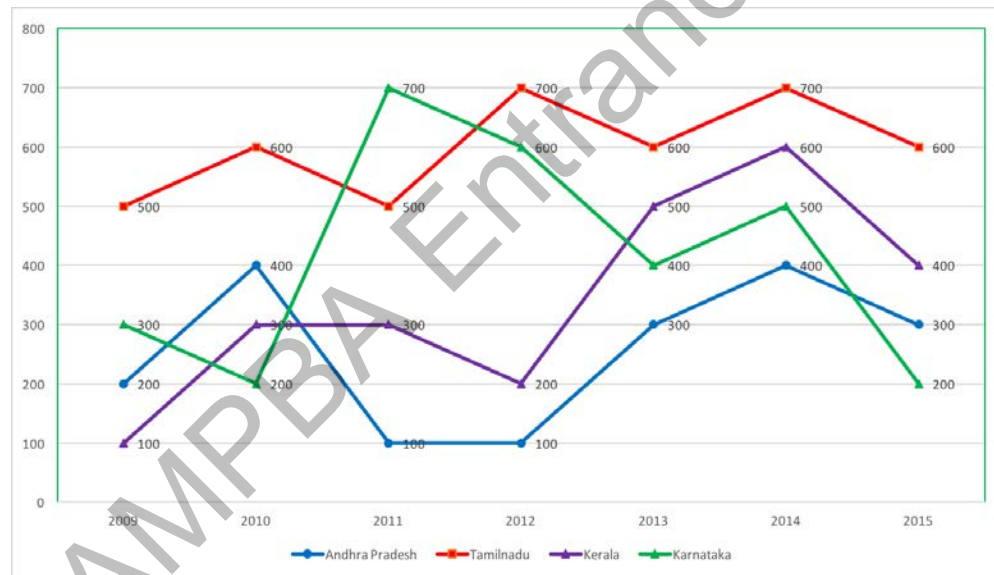
- **A.** 74.8%
- **B.** 80.1%
- **C.** 88.7%
- **D.** 90.2%

Q5. Difference between number of applicants enrolled for schools A, B, D and the number of applicants who passed the entrance test for schools C and E is?

- **A.** 2875
- **B.** 3765
- **C.** 4465
- **D.** 4900

Information for questions 6-7:

The line graph shows the number of persons who died in train accidents in various states in different years

6. What is the ratio of the number of persons who died in train accidents in 2010 to that in 2013?
- A. 5 : 6
- B. 8 : 7
- C. 10 : 9
- D. 14 : 13
- E. 16 : 15

7. The number of persons who died in train accidents in 2014 is how much percent more than the number of persons who died in the train accidents in 2010?

    A. 137.5%

    B. 43.5%

    C. 146.67%

    D. 46.67%

    E. 153.33%

Directions (Q. 8-10): Study the following table chart carefully to answer the question given below:

The following table gives the **percentage** of marks obtained by five students in six different subjects in an examination.

Student	Subject (Max. Marks)					
	Statistics	Data Collection	Data Visualization	BigData Management	Machine Learning	Deep Learning
	(100)	(50)	(50)	(120)	(100)	(80)
S1	80	90	80	60	60	70
S2	95	80	78	70	70	80
S3	70	90	70	75	80	80
S4	55	80	86	65	78	75
S5	60	70	72	70	75	80

Note: The Numbers in the parentheses are the Maximum Marks in Each Subject.

Q-8: What is the average marks (absolute) obtained by all the five students in Deep Learning? (Rounded off to two digit after decimal)

    a) 61.60   b) 62.60   c) 60.80   d) 58.60   e) 64.20

Q-9: What is the overall average percent score of S2 in all the six subjects?

    a) 78.4%   b) 76.8%   c) 70.6%   d) 70.8%   e) None of the above

Q-10: Later, an error was discovered in a 10 marks question in data visualization and it was decided that any student who attempted the question would be given full ten marks.

Select from the pairs below in which if only one of the students from the pair gets the benefit of the erroneous question then the *ranks* (based on total marks) of the two students in the pair would interchange.

1. S1,S3
2. S2, S3
3. S1, S4

a) Only 1
b) Only 2
c) Only 3
d) both 1 and 3
e) both 2 and 3

PROBABILITY

Q1. A statistician predicts that the odds against the value of a certain regressor will go up during the next analysis are 2:1 and the odds in favor of the value remaining the same are 1:3. What is the probability that the value of the regressor will go down during the next analysis?

A. $\frac{7}{12}$

B. $\frac{11}{12}$

C. $\frac{1}{12}$

D. $\frac{5}{12}$

Q2. In how many ways can 16 different gifts be divided among four children such that each child receives exactly four gifts?

A. $(4!)^4$

B. $16!/(4!)^4$

C. $16!/4!$

D. 4^{16}

Q3. If all words with 2 distinct vowels and 3 distinct consonants were listed alphabetically, what would be the rank of "ACDEF'?

A. 4716
B. 4720

C. 4718

D. 1717

Q4.Let us assume Telangana State Vehicle registration plates need to have exactly 10 characters, the first two being 'TS', the second two are each a digit between 0 to 9, the next two are alphabets and the last four are again each a digit between 0 to 9. For example: TS 09 MD 2901, TS 02 RS 0019 etc. How many different license plate numbers can be generated?

A. 10^8

B. $26*10^6$

C. 26^2*10^6

D. $26*25*10!$

Q5. A, B, C are 3 events in a Sample Space 'S'. What event does the shaded region represent?
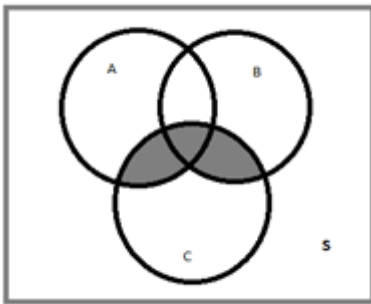
A. $A \cap B \cap C$
B. $(A \cup C) \cap B$
C. $(A \cup B) \cap C$
D. $(C \cap B) \cup A$

Q6. Joan has 100 candies to distribute among 10 children. If each child receives at least 1 candy and no two children receive the same number of candies, what is the maximum number of candies that a child can receive?

A. 34
B. 39
C. 45
D. 55

Q7.I am keen on seeing Amir Khan's latest movie this evening only. When I raised this with my husband, he said we will go to watch the movie if he can come back from office by 6 pm. Past experience tells me that he comes back from office by 6 pm only 7 out of 10 times. If he doesn't come home by 6 pm today, I will suggest a dinner in my favorite restaurant YUMMY DELICACY. Again from the past experience, I know that he would agree with a probability of 0.6. If neither

movie nor dinner materializes, I will fight with him with a probability of 0.9. What is the probability that I don't end up fighting with him this evening?

A) 0.892

B) 0.5

C) 0.88

D) None of the above

Q8. A box contains 9 red toys, 7 green toys and 9 blue toys. Each ball is of a different size. The probability that the red ball being selected is the smallest red toy, is:

A. 1/9

B. 2/21

C. 1/25

D. 6/25

Q9. A card is selected at random from an ordinary deck of 52 playing cards. If A is the event that the selected card is an ace and B is the event that it is a spade, which of the following statements is true?

A. A and B are equally likely

B. A and B are independent

C. A and B are disjoint

D. None of the above

Q10. If points A and B are randomly placed on the circumference of a circle with radius 2, what is the probability that the length of chord AB is greater than 2?

A. 1/3

B. 1/2

C. 2/3

D. 3/4

STATISTICS

Q1. Vivek, Rahul and Pankaj were given the work of investigating average of 500 observations.

Method of Vivek: Divide the set into sets of 100 each. Calculate the average in each set and then calculate average of these averages.

Method of Rahul: Divide the set into 200 and 300 observations. Calculate the average in each set and then calculate average of these averages.

Method of Pankaj: 50 numbers were unities. He averaged all other numbers and then added one.

Which of the following person's method are correct:

A. Vivek and Rahul
B. Vivek only
C. Vivek, Rahul and Pankaj
D. Rahul and Pankaj

Q2. There are 10 employees in an office, not counting the office manager. The table shows how many employees have 0, 1, 2 or 3 pets. If the office manager also were included in the table, the average (arithmetic mean) number of pets per person would equal the median number of pets per person. How many pets does the office manager have?

# of pets	# of employees
0	2
1	3
2	2
3	3

A. 4
B. 5
C. 6
D. 7

Q3. The probability distribution of a random variable X is given in the table below

x	P(X = x)
0	0.24
1	0.38
2	0.20
3	0.13
4	0.05

Find the standard deviation σ of X.

A. 1.13

B. 0.5

C. 3.31

D. 0.75

Q4. Data on the health status of 100 in-patients in a hospital at the time of discharge from the hospital are available. For each patient the health status is recorded as sick or recovering or completely recovered.

The scale in which data are recorded is

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Q5. What is the standard deviation of the set of data: x + 1, x + 2, x + 5, x + 9, x + 8.

A.   12.5
B.   x + 3.53
C.   3.53
D. $\sqrt{(x^2+12.5)}$

Q6. Set X consists of 100 numbers. The average of set X is 10, and the standard deviation is 4.6. Which of the following two numbers, when added to set X, will decrease the set's standard deviation by the greatest amount?

A.   -100 and -100
B.   0 and 0
C.   0 and 20
D.   10 and 10

Q7. If two variables X and Y are 'perfectly' correlated, which of the following accurately depicts the relationship between the two variables:

A.   xy = 1
B.   p/x + q/y = 1, for some non-zero constants p and q
C.   x + y = 1
D.   pX+qY = 1, for some non-zero constants p and q

Q8. 40% of the employees in a factory are workers. All the remaining employees are executives. The annual income of each worker is Rs. 390. The annual income of each executive is Rs. 420. What is the average annual income of all the employees in the factory together?

A. 390

B. 405

C. 408

D. 415

Q9. For the Statistics scores of a particular class, the variance is σ2 If each student's score is increased by β points, then variance of the set of new scores is,

A. σ2
B. β^2σ2
C. β + σ2
D. β^2+ σ2

Q10. If the mode, median and mean of a distribution are 5, 6, 7 respectively, then the distribution is:

A. skewed negatively

B. not skewed

C. skewed positively

D. Incomplete information