3.1 Practice Questions

Solve the problems and indicate the best of the answer choices given.

Numbers: **All numbers used are real numbers.**

Figures: **A figure accompanying a problem-solving question is intended to provide useful information for solving the problem. Figures drawn as accurately as possible. Exceptions be clearly noted. Lines shown as straight are straight, and lines that appear jagged are als straight. The positions of points, angles, regions, etc., exist in the order shown, and a measures are greater than zero. All figures li a plane unless otherwise indicated.**

1 Number Properties

1. Which of the following is equal to $\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right)$

(A) $\frac{1}{12}$

(B) $\frac{1}{6}$

(C) $\frac{1}{4}$

(D) $\frac{1}{3}$

(E) $\frac{1}{2}$

2. Express $7.58\overline{3}$ as a fraction:

(A) $\frac{91}{12}$

(B) $\frac{44}{6}$

(C) $\frac{99}{14}$

(D) $\frac{22}{3}$

(E) $\frac{148}{21}$

3. Prakash bought a bag of 15 magic pencils for Rs. 60. One-third of the pencils cost Rs. 2 each and the rest cost Rs. 5 each. If there was a hole in the bag and all of the more expensive pencils fell out, the lost pencils represented approximately what percentage of the money Prakash paid for all the pencils?

(A) 7%

(B) 13%

(C) 67%

(D) 83%

(E) 88%

4. Company H distributed Rs. 4,000 and 180 pens evenly among its employees, with each employee getting an equal integer number of Rupees and an equal integer number of pens. What is the highest number of employees that could work for Company H?

(A) 9

(B) 10

(C) 20

(D) 40

(E) 180

5. If t is divisible by 12, what is the least possible integer value of a for which $\frac{t^2}{2^a}$ might not be an integer?

(A) 2

(B) 3

(C) 5

(D) 6

(E) 40

6. If $5^{k+1} = 2{,}000$, what is $5^k + 1$?

(A) 399

(B) 401

(C) 1,996

(D) 2,000

(E) 2,001

7. Which of the following is equal to $\left(\sqrt[2]{x}\right)\left(\sqrt[3]{x}\right)$?

(A) $\sqrt[5]{x}$

(B) $\sqrt[6]{x}$

(C) $\sqrt[3]{x^2}$

(D) $\sqrt[5]{x^6}$

(E) $\sqrt[6]{x^5}$

8. If $125^{14}48^{8}$ is written as an integer, how many consecutive zeroes will that integer have at the end?

(A) 22

(B) 32

(C) 42

(D) 50

(E) 112

9. If *n* is the smallest of three consecutive positive integers, which of the following must be true?

(A) n is divisible by 3

(B) n is even

(C) n is odd

(D) (n)(n + 2) is even

(E) n(n + 1)(n + 2) is divisible by 3

10. If $\frac{17}{2^{10} \times 5^{13}}$ is expressed as a terminating decimal, how many zeroes are located to the right of the decimal point before the first non-zero digit?

(A) 10

(B) 12

(C) 13

(D) 15

(E) 17

11. If $25^{5}4^{6} = 10^{x} + a$, and x is an integer, what could be the minimum positive value of *a*?

(A) 0

(B) 30,000

(C) 30,000,000

(D) 10,000,000,000

(E) 30,000,000,000

12. What is the unit digit of 7^{86}?

(A) 0

(B) 1

(C) 3

(D) 7

(E) 9

13. What is the difference between the sum of all even positive integers between 1 and 100 (inclusive) and the sum of all odd positive integers between
100 and 150?

(A) –575

(B) –475

(C) 225

(D) 475

(E) 575

14. When 5, 8 and 12 divide a multiple of 13, they leave remainders of 3, 6 and 10, respectively. What is the least such number? ***(Real NMAT Question)***

(A) 169

(B) 478

(C) 598

(D) 1,298

(E) 1,602

15. The sum of the last digits of the numbers of the form $2^{2n + 1}$, for n = 0, 1, 2, 3 and 4, when divided by 7 gives a remainder

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

16. If ‘a’ and ‘b’ are prime numbers, then what is the H.C.F. of the numbers $(a^2 + b^2)$, $(a + b + 1)$ and $(a^2 + b^2 – 1)$?

(A) 1

(B) 2

(C) 3

(D) 4

(E) Cannot be determined

17. A three digit number is such that its hundredth digit is equal to the product of the other two digits which are prime numbers. Also, the difference between the number and its reverse is 297. Then, what is the ten’s digit of the number?

(A) 2

(B) 3

(C) 5

(D) 6

(E) 7

18. When a two digit number is divided by the sum of its digits, the quotient is 4. If the digits are reversed, the new number is 6 less than twice the original number. The number is

(A) 12

(B) 21

(C) 24

(D) 42

(E) Both (C) and (D)

19. A five-digit number is formed using the digits 1, 3, 5, 7 and 9 without repetition. What is the sum of all such possible numbers?

(A) 6666600

(B) 6666660

(C) 6666666

(D) 6666000

(E) None of these

20. A positive integer 'A' is a multiple of 180 and it has 40 factors. If 'A' is less than 3,000, then the value of $\frac{A}{40}$ is

(A) 54

(B) 60

(C) 240

(D) 270

(E) Cannot be determined

21. If the number 5237ab is completely divisible by 3, find the possible values of a + b.

(A) 2

(B) 5

(C) 8

(D) 15

(E) 16

22. A number A gives a remainder of 7 when divided by 9. Find the remainder when 2A is divided by 9.

(A) 1

(B) 2

(C) 5

(D) 8

(E) 14

23. At a nature trail camp, one-fifth of the total members went rock climbing; twice the square root of the total members went hiking up a mountain trail. The remaining 10 were exploring in caves. How many members went hiking? ***(Real NMAT Question)***

(A) 5

(B) 10

(C) 15

(D) 20

(E) 25

24. What is the highest power of 2 in the expression $(2^{10} - 1)!$? ***(Real NMAT Question)***

(A) $2^5 - 1$

(B) $2^7 - 6$

(C) $2^8 - 9$

(D) $2^9 - 10$

(E) $2^{10} - 11$

25. During the morning assembly in a school, all the students can stand in rows so that each row has 8, 10 or 12 students. Which of the following could be the least number of students in the school? ***(Real NMAT Question)***

(A) 20

(B) 30

(C) 60

(D) 100

(E) 120

26. What is the value of the following expression? $2^{\log 2^{\log 2^{-\infty}}}$ ***(Real NMAT Question)***

(A) 0

(B) $\frac{1}{2}$

(C) 1

(D) 2

(E) 4

27. Which of the following numbers is divisible by 9? ***(Real NMAT Question)***

(A) 1,203

(B) 2,256

(C) 42,651

(D) 71,623

(E) 92,423

28. If August 15, 1947 was a Friday, then, what was the day on January 26, 1950?

(A) Thursday

(B) Friday

(C) Saturday

(D) Sunday

(E) Monday

29. What was the day on April 20, 1984?

(A) Thursday

(B) Friday

(C) Saturday

(D) Sunday

(E) Monday

30. If in a certain year, the month of January had exactly 4 Wednesdays and 4 Sundays, then January 1 of that year was a

(A) Saturday

(B) Monday

(C) Wednesday

(D) Friday

(E) Thursday

31. Puja born in 1900s realised that in 1980 his age was the square root of the year of her birth. When was Puja born?

(A) 1929

(B) 1936

(C) 1940

(D) 1946

(E) 1949

32. If 09.12.2001 happens to be a Sunday, then 09.12.1971 would have been a

(A) Saturday

(B) Monday

(C) Wednesday

(D) Friday

(E) Thursday

33. If $\log_{10}2 = 0.3010$, what is the value of $\log_5 256$? ***(Real NMAT Question)***

(A) 3.11

(B) 3.26

(C) 3.44

(D) 3.67

(E) 3.82

34. Find the value of 'x' if $625^{\log_{36}6} + 12^{\log_7 49} = 11^{\log_x 169}$

(A) 10

(B) 11

(C) 13

(D) 17

(E) 19

35. If $\log_{30} 3 = x$ and $\log_{30} 5 = y$, then find the value of $\log_8 30$.

(A) $3(1 - x - y)$

(B) $\frac{1}{3(1-x-y)}$

(C) $\frac{3}{(1-x-y)}$

(D) $\frac{(1-x-y)}{3}$

(E) None of these

36. If $a^p = b^q = c^r = d^s$, then find the value of $\log_a (bcd)$.

(A) $p\left(\frac{1}{q}+\frac{1}{r}+\frac{1}{s}\right)$

(B) 1

(C) $\frac{1}{q}+\frac{1}{r}+\frac{1}{s}$

(D) $\frac{p}{\left(\frac{1}{q}+\frac{1}{r}+\frac{1}{s}\right)}$

(E) $\frac{\left(\frac{1}{q}+\frac{1}{r}+\frac{1}{s}\right)}{p}$

37. If $\log_y x = 10$, then find the value of $\log_{x^3} y^6$

(A) $\frac{1}{6}$

(B) $\frac{1}{5}$

(C) 5

(D) 6

(E) Both $\frac{1}{6}$ and $\frac{1}{5}$

38. If $P = 625^{\frac{2}{\log_3 25}} + 25^{\log_{125} 27} + 5^{\frac{5}{\log_8 125}}$, then find the value of 'P'.

(A) 90

(B) 92

(C) 122

(D) 136

(E) 154

2 Arithmetic

1. The number that is 50% greater than 80 is what percent less than the number that is 25% less than 200?

(A) 5%

(B) 10%

(C) 15%

(D) 20%

(E) 25%

2. Aakash spends 50% of his income on rent, utilities, and insurance, and 20% on food. If he spends 30% of the remainder on video games and has no other expenditure, what percent of his income is left after all the expenditure?

(A) 0%

(B) 9%

(C) 20%

(D) 21%

(E) 30%

3. In a class of 40 students, exactly 90% had lower marks than Varun's marks. 60 new students join Varun's class. If Varun's marks were higher than those of 80% of the new arrivals, what percent of the combined class now had higher marks than Varun's marks?

(A) 86%

(B) 85%

(C) 16%

(D) 15%

(E) 14%

4. Machines X and Y pack books continuously, each working at a constant rate, but Machine Y works 50% faster than Machine X. If Machine Y packs 48,000 more books in a 24-hour period than

Machine X does, what is Machine X's packing rate in books per hour?

(A) 4,000

(B) 6,000

(C) 8,000

(D) 12,000

(E) 16,000

5. An apple vendor sells 50% of his stock everyday. 10% of his stock gets spoiled overnight. After three nights he calculates that a total of 3,305 apples have spoiled. How many apples did he start out with on the first day? (Assume that he has purchased apples only on the first day.) ***(Real NMAT Question)***

(A) 25,000

(B) 30,000

(C) 35,000

(D) 40,000

(E) 45,000

6. Ankur bought 5 Pizzas, 7 Samosas and 4 ice-creams. Sanjeev bought 6 Pizzas, 14 Samosas and 8 Ice creams for an amount which was 50% more than what Ankur paid. What percentage of the total amount spent by Ankur was spent on the Pizzas?

(A) 37.5%

(B) 45%

(C) 50%

(D) 56.5%

(E) 62.5%

7. By selling the burger at Rs. 260 per piece, Sameer gains 30%. Find the cost price of the burger per piece?

(A) Rs. 150

(B) Rs. 200

(C) Rs. 250

(D) Rs. 300

(E) Rs. 350

8. Ghosh Babu, a trader, marked up his goods 30% over the cost price and then he gave the discount of 5%. What was the profit percentage of Ghosh Babu in the whole transaction?

(A) 19.5%

(B) 21.5%

(C) 23.5%

(D) 25.5%

(E) None of these

9. The value of (p % q + q% of p) is:

(A) p% of q

(B) q% of p

(C) 2% of pq

(D) pq% of 3

(E) None of these

10. 'p' is five times as large as 'q'. By what percent is q less than p?

(A) $16\frac{2}{3}\%$

(B) 37.5%

(C) 60%

(D) 80%

(E) 90%

11. A 735 gm sample of a 16% (by weigh) solution of iodine in alcohol is kept for three days. Some of the alcohol gets evaporated and the concentration of the solution becomes 20% (by weight). What amount of alcohol gets evaporated?

(A) 135 gm

(B) 140 gm

(C) 147 gm

(D) 150 gm

(E) 215 gm

12. The interest rate, compounded annually, that would bring a principal of Rs. 1,200 to a final value of Rs. 1,650 in 2 years is approximately:

(A) 17%

(B) 18%

(C) 19%

(D) 20%

(E) 21%

13. An amount becomes 3 times in 6 years on a certain rate of simple interest. In how many years it will become 24 times?

(A) 48 Years

(B) 50 Years

(C) 69 Years

(D) 70 Years

(E) 72 Years

14. What is the value of the rate of interest if the difference between the compound interests of the first and the second year is 4 times that of the principal?

(A) 50%

(B) 100%

(C) 150%

(D) 200%

(E) 400%

15. Some amount was divided into two equal parts. The first part was invested at 10% per annum at simple interest for 4 years. The second part was invested at 10% per annum at compound interest for 3 years. If the difference in the interests earned from the two investments is Rs. 1000, find the approximate value of the total initial amount.

(A) Rs. 28,485

(B) Rs. 28,985

(C) Rs. 29,485

(D) Rs. 29,985

(E) Rs. 30,485

16. The value of a car depreciates at the rate of 10% per annum. If its present value is Rs. 121,500, then what was the value of the car two years ago?

(A) Rs. 100,000

(B) Rs. 150,000

(C) Rs. 200,000

(D) Rs. 250,000

(E) Rs. 300,000

17. Ram lent Rs. 800 to a friend for 2 years and one-fourth of this amount to another friend for 3 years. He received Rs. 275 in total as simple interest. What was the rate of interest?

(A) 10.5%

(B) 12.5%

(C) 15.5%

(D) 17.5%

(E) 19.5%

18. At what interest rate per annum will a sum of money double itself in 8 years?

(A) $12\frac{1}{2}\%$

(B) 13%

(C) 15%

(D) 17%

(E) 19%

19. Parikshit invests Rs. 1,546 in BNP bank at a certain rate of compound interest per annum. At the end of 8 years, he finds that his money has doubled. What approximately is the rate of interest BNP bank paid him?

(A) 9%

(B) 12%

(C) 15%

(D) 16%

(E) 18%

20. Giri divided his property between his children Suma and Dev. Suma invested her share at 10% per annum simple interest and Dev invested his share compounded at 8% per annum. At the end of 2 years, the interest received by Suma is Rs. 13,360 more than the interest received by Dev. What was Suma's share if the total amount divided was
Rs. 2,50,000? ***(Real NMAT Question)***

(A) Rs. 50,000

(B) Rs. 63,360

(C) Rs. 1,13,360

(D) Rs. 1,50,000

(E) Rs. 1,63,360

21. Which of the following is the interest rate if the difference between the compound interest and the simple interest on Rs. 12,500 for 3 years is Rs. 561.60? ***(Real NMAT Question)***

(A) 10%

(B) 11%

(C) 12%

(D) 13%

(E) 15%

22. Arvind sells clothes at a roadside market for which he pays Rs. 150 per day to rent a table plus Rs. 10 per hour to his salesman. He sells an average of Rs. 78 worth of clothes per hour. Assuming no other

costs, which of the functions below best represents profit per day P in terms of hours h that Arvind works for?

(A) P(h) = 238 – 10h

(B) P(h) = 72 – 10h

(C) P(h) = 68h – 150

(D) P(h) = 78h – 160

(E) P(h) = –160h + 78

23. A batch of clips costs Rs. (p + 15) for a company to produce and each batch sells for Rs. p (9 – p). For which of the following values of p does the company make a profit?

(A) 3

(B) 4

(C) 5

(D) 6

(E) 7

24. Priya deposited Rs. 20,000 on 1st January, 2014 to open a savings account. She withdrew Rs. 1,000 on the 10th of every month. She closed her account on 6th June, 2014. If the bank pays interest at 4% p.a, then approximately how much interest did she receive on closing the account? ***(Real NMAT Question)***

(A) Rs. 192

(B) Rs. 283

(C) Rs. 296

(D) Rs. 384

(E) Rs. 420

25. A teacher distributed 50 worksheets among the students of three sections in a class. The worksheets were distributed among 6 students of Section A, 12 students of Section B, and 17 students of Section C. The number of worksheets received by 2 students of Section A was equal to the number of worksheets received by 5 students of Section C. The number of worksheets received by 2 students of Section B was equal to the number of worksheets

received by 3 students of Section C. How many worksheets did each student of Section C receive?

Note: Assume that each student of a particular section received the same number of sheets. ***(Real NMAT Question)***

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

26. A shopkeeper claims a loss of 4% on his goods, but uses weight equal to 840 gm instead of 1 kg. The shopkeeper actually makes a:

(A) $11\frac{1}{7}\%$ gain

(B) $14\frac{2}{7}\%$ gain

(C) 4% loss

(D) 4% gain

(E) 2% loss

27. A product priced at Rs. 1,000 would earn a shopkeeper a profit of 15%. Find the profit percentage earned by him if he decides to sell the product at a discount of Rs. 50 during the festivals.

(A) 3.34%

(B) 9.15%

(C) 9.25%

(D) 9.30%

(E) 9.50%

28. A container contains milk and water in the ratio of 6 : 5. Both milk and water are increased by the same quantity. Which of the following can be the ratio of milk and water in the new mixture? ***(Real NMAT Question)***

(A) 15 : 9

(B) 7 : 5

(C) 19 : 15

(D) 13 : 10

(E) 11 : 10

29. The capital of a company, Estyle, is made of 75,000 preferred shares with a dividend of 15% and 20,000 common shares, with the par value of each type of share as Rs. 10. The total profit of Estyle was Rs. 2,40,000 of which Rs. 40,000 was kept in a reserve fund. The remaining profit was distributed to the shareholders. What would be the difference in the dividend percentage given to the common shareholders if the amount kept away in the reserve fund was reduced to Rs. 25,000? ***(Real NMAT Question)***

(A) 5.75%

(B) 7.5%

(C) 10%

(D) 12.75%

(E) 15%

30. If the compound ratio of 8 : $5\frac{1}{3}$ and the inverse of $3\frac{1}{5} : 1\frac{1}{3}$ is 15 : x, then x is ***(Real NMAT Question)***

(A) 20

(B) 40

(C) 60

(D) 80

(E) None of the above

31. Pipe A can fill a tank in 5 hours, while Pipe B can empty the tank in 6 hours. If both the pipes are opened simultaneously, how much time will it take to fill the tank completely? ***(Real NMAT Question)***

(A) 11 hr

(B) 30 hr

(C) 45 hr

(D) $\frac{11}{30}$ hr

(E) $\frac{8}{11}$ hr

32. A alone can complete a task in 10 days. B can complete the same task in 15 days. If A and B work together, how much time will it take to complete the same task? ***(Real NMAT Question)***

(A) 3 days

(B) 5 days

(C) 6 days

(D) 9 days

(E) 10 days

33. A water tank had 3 taps. The first tap could fill the tank in 10 minutes and the second tap could fill the tank in 15 minutes. When all the 3 taps were opened simultaneously, the tank was filled in 22 minutes. In how many minutes did the third tap fill or empty the tank? ***(Real NMAT Question)***

(A) 6.50

(B) 8.25

(C) 9.27

(D) 15.67

(E) 18.50

34. A chemist is mixing a solution of ink and water. She currently has 30 litres of mixture solution, of which 10 litres are ink. How many litres of ink should the chemist add to her current mixture to attain a 50 : 50 mixture of ink and water if no additional water is added?

(A) 2.5

(B) 5

(C) 10

(D) 15

(E) 20

35. A full glass of lemonade is a mixture of 20% lime juice and 80% soda. The contents of the glass are poured into a pitcher that is 200% bigger than the glass. The remainder of the pitcher is filled with 16 litres of water. What was the original volume of lime juice in the mixture?

(A) 1.6 litres

(B) 3.2 litres

(C) 4.8 litres

(D) 6.4 litres

(E) 8 litres

36. In a college dramatics team, the ratio of boys to girls is 6 : 7. If there are 2 more girls than boys in the team, how many boys are in the team?

(A) 12

(B) 18

(C) 24

(D) 30

(E) 36

37. X cornflake is 55% fibre and Y cornflake is 70% fibre. Sharad combines a certain amount of the two cereals in a single bowl, creating a mixed cereal that is 65% fibre. If the bowl contains 120 grams of cereal, how much of the cereal, in grams, is X?

(A) 30

(B) 40

(C) 60

(D) 80

(E) 90

38. A pump can be used for filling as well as emptying a tank. The capacity of the tank is 1,500 m^3. The emptying capacity of the tank is 10 m^3 per minute higher than its filling capacity and the pump needs

5 minutes less to empty the tank than it needs to fill it. What is the emptying capacity of the tank? ***(Real NMAT Question)***

(A) 10 m^3 per minute

(B) 30 m^3 per minute

(C) 40 m^3 per minute

(D) 50 m^3 per minute

(E) 60 m^3 per minute

39. In what ratio, solution X which contains 50% milk and solution Y which contains 30% milk be mixed so that the obtained solution contains 45% milk?

(A) 1 : 3

(B) 2 : 3

(C) 3 : 2

(D) 3 : 5

(E) 3 : 1

40. A tank has a solution consisting of milk and water in equal proportion. This solution is transferred into a vessel having 100 ml pure water at the rate of 10 ml per second. In how much time from the start of the transfer, will the ratio of milk to water in the vessel be 1 : 3?

(A) 5 seconds

(B) 10 seconds

(C) 15 seconds

(D) 20 seconds

(E) 25 seconds

41. The sum of the ages of the six members in a family is 130 years. If the age of the children is in the ratio 1:2:6:7 while the combined age of their parents is 82 years, find the age of the eldest child.

(A) 7 years

(B) 14 years

(C) 21 years

(D) 28 years

(E) 35 years

42. The population of a country increased at the rate of 6% per year. If the present population of the country is 23,452 million, what was the approximate population of the country 3 years ago? ***(Real NMAT Question)***

(A) 18,765 million

(B) 18,967 million

(C) 19,691 million

(D) 20,872 million

(E) 21,432 million

43. If the average of a, b, c, 5, and 6 is 6, what is the average of a, b, c, and 13?

(A) 8

(B) 8.5

(C) 9

(D) 9.5

(E) 10.5

44. Average weight of 37 students is 42 kg. When their teacher joined them, their average weight increased by 2 kg. What is the weight of the teacher?

(A) 112 kg

(B) 114 kg

(C) 116 kg

(D) 118 kg

(E) 120 kg

45. Two persons of average age 40 years leave a group and hence the average age of the remaining group increases from 50 to 52 years. Find the number of persons originally in the group.

(A) 5

(B) 7

(C) 8

(D) 10

(E) 12

46. If the average weight of 8^{th}, 9^{th} and 10^{th} class is in the ratio of a:b:c and the number of students in class 8^{th}, 9^{th} and 10^{th} is in the ratio of x:y:z, then the average weight of all the three classes considered together is

(A) $\frac{a+b+c}{x+y+z}$

(B) $\frac{a}{x}+\frac{b}{y}+\frac{c}{z}$

(C) $\frac{ax+by+cz}{x+y+z}$

(D) $\frac{ax+by+cz}{a+b+c}$

(E) Cannot be determined

47. The average age of a husband and wife who were married 5 years ago, was 25 years then. The average age of the family including the husband, the wife and two children who were born during the interval is 16 years now. How old are the children now? [All of them have different ages with integral values.]

(A) 1 year, 3 years

(B) 4 years, 1 year

(C) 2 years, 3 years

(D) 2 years, 2 years

(E) None of these

48. The time it takes to construct a hut is inversely proportional to the number of workers doing the work. If it takes 40 workers giving 3 hours each to do the job, how long will it take for 140 workers to do the job, to the nearest minute?

(A) 51 minutes

(B) 52 minutes

(C) 53 minutes

(D) 54 minutes

(E) 55 minutes

49. A ski resort has enough wood to keep 20 rooms heated for 14 days. If the resort decides to save wood by turning off the heat in 5 unoccupied rooms, and each room requires the same amount of wood to heat it, how many extra FULL days will the wood supply last?

(A) 3

(B) 4

(C) 5

(D) 18

(E) 19

50. Working alone at their respective constant rates, Ajay can complete a certain job in 4 hours, while Firoz can do the same job in 3 hours. Ajay and Firoz worked together on the job and completed it in 2 hours, but while Ajay worked this entire time, Firoz worked for some of the time and took 3 breaks of equal length. How many minutes long were each of Firoz' breaks?

(A) 5 minutes

(B) 10 minutes

(C) 15 minutes

(D) 20 minutes

(E) 25 minutes

51. A machine can manufacture 20 pens per hour, and exactly 10 such pens fit into every box. Mahesh packs pens in boxes at a constant rate of 3 boxes per hour. If the machine ran for 2 hours and was then turned off before Mahesh started packing the pens in boxes, how many minutes would it take Mahesh to pack all the pens that the machine had made?

(A) 40 minutes

(B) 45 minutes

(C) 80 minutes

(D) 160 minutes

(E) 800 minutes

52. Two taps can separately fill a tank in 4 minutes and 5 minutes respectively. Due to a small hole at the bottom of the tank, the two taps together take 30 seconds more time to fill the tank. The hole can empty the completely filled tank in

(A) $\frac{980}{71}$ minutes

(B) $\frac{980}{81}$ minutes

(C) $\frac{980}{91}$ minutes

(D) $\frac{980}{61}$ minutes

(E) $\frac{981}{51}$ minutes

53. Three taps P, Q and R when filling together can fill a cistern in 3 hours. After 1 hour tap P is closed and the cistern is filled in 4 more hours. Find the time in which tap P alone can fill the cistern?

(A) 3 hours

(B) 4 hours

(C) 5 hours

(D) 6 hours

(E) 7 hours

54. Pipes P and Q can fill a tank in 12 minutes and 16 minutes respectively. Both are kept open for X minute(s) and then Q is closed and P fills the rest of the tank in 5 minutes. The time X after which Q was closed is

(A) 2 minutes

(B) 3 minutes

(C) 4 minutes

(D) 6 minutes

(E) 7 minutes

55. Pipe X pours a mixture of acid and water, and pipe Y pours pure water into a bucket. After 1 hour, the bucket got filled and the concentration of acid in the bucket was noted to be 8%. If pipe Y was closed after 30 minutes and pipe X continued to pour the mixture, concentration of acid in the bucket after 1 hour would have been 10%. What is the ratio of acid to the water in the mixture coming out of pipe X?

(A) 13 : 2

(B) 2 : 15

(C) 3 : 20

(D) 1 : 5

(E) 2 : 13

56. Two taps P and Q can fill a cistern in 12 minutes and 18 minutes respectively. If both the taps are opened together, how long it take to fill the cistern?

(A) $\frac{5}{36}$ minutes

(B) $5\frac{1}{5}$ minutes

(C) $6\frac{1}{5}$ minutes

(D) $7\frac{1}{5}$ minutes

(E) None of these

57. There are 12 workers who have been recruited to dig a 20 km long tunnel. It takes one worker to dig 250 m of tunnel in a week. How many more workers are needed to complete the work in 2 weeks?

(A) 12

(B) 18

(C) 20

(D) 24

(E) 28

58. If 33 unskilled workers can do a work in 15 days of 12 hours each, how many skilled workers can do 50% more work in 11 days of 9 hours each? (Assume that it takes 2 skilled workers to do the work of 5 unskilled workers.)

(A) 36

(B) 42

(C) 64

(D) 90

(E) 100

59. Ajay finishes a work in certain number of days. He got two assistants who work $\frac{3}{4}$ as fast as him. If all three work together, then in what fraction of time would they finish the job as compared to Ajay working alone?

(A) $\frac{5}{3}$

(B) $\frac{3}{5}$

(C) $\frac{2}{3}$

(D) $\frac{2}{5}$

(E) $\frac{3}{2}$

60. A and B can do a piece of work in $22\frac{2}{9}$ days, B and C can do it in $16\frac{2}{3}$ days, A and C can do the work in $15\frac{5}{13}$ days. Arrange the three in decreasing order of productivity.

(A) C > A > B

(B) B > C > A

(C) A > C > B

(D) C > B > A

(E) B > A > C

61. Tina, Ishan, Abhishek and Fatima jointly started a business and invested a total of Rs. 80. If Tina's share increases by Rs. 3, Ishan's share increases by one-third of his share, Abhishek's share decreases by 20% and Fatima's share decreases by Rs. 4, all of them would have equal amounts of money. What is Fatima's original share?

(A) Rs. 20.25

(B) Rs. 23. 50

(C) Rs. 23.75

(D) Rs. 24.25

(E) Rs. 24.75

62. Mukesh, Manish, Lalu and Jaggi bought a MOKIA mobile for £60. Mukesh paid one–half of the sum of the amounts paid by the other persons. Manish paid one–third of the sum of the amounts paid by the other persons. Lalu paid one–fourth of the sum of the amounts paid by the other persons. How much did Jaggi have to pay?

(A) £ 13

(B) £ 15

(C) £ 17

(D) £ 23

(E) None of these

63. Yogesh and Mohan, two business partners, invest Rs. 21,000 and Rs. 17,500 respectively in their garment business and at the end of the year both of them make a profit of Rs. 26,400. Find their individual shares in the profit.

(A) Rs. 14,400 and Rs. 12,000

(B) Rs. 12,000 and Rs. 14,400

(C) Rs. 14,000 and Rs. 12,400

(D) Rs. 14,200 and Rs. 12,200

(E) None of these

3 Algebra and Probability

1. If $3x^3 - 7 = 185$, what is $x^2 - x$?

(A) –4

(B) 8

(C) 12

(D) 16

(E) 27

2. If the arithmetic mean of two numbers is three times their geometric mean, then the ratio of the numbers can be given by: ***(Real NMAT Question)***

(A) $(17 - 12\sqrt{2}) : 2$

(B) $(17 + 12\sqrt{2}) : 1$

(C) $(34 - 24\sqrt{2}) : 1$

(D) $(17 + 12\sqrt{2}) : 2$

(E) $(33 + 24\sqrt{2}) : 2$

3. If the roots of the equation $ax^2 + bx + c = 0$ are reciprocal of the roots of the equation $px^2 + qx + r = 0$, then which of the following represents relation(s) between a, b, c, p, q and r? ***(Real NMAT Question)***

(A) $a = \frac{1}{p}$

(B) $b = \frac{1}{q}$

(C) $c = \frac{1}{r}$

(D) a = p, c = r and b = 1

(E) a = r, c = p and b = q

4. If a, b and c are the three positive integers in geometric progression, then the roots of the equation $ax^2 + 4bx + 2c = 0$ are

(A) Imaginary

(B) Equal

(C) Rational

(D) Real

(E) Irrational

5. If p and q are roots of $x^2 + 7x + 12 = 0$, then the equation whose roots are $(p + q)^2$ and $(p – q)^2$ is

(A) $x^2 – 50x + 49 = 0$

(B) $x^2 + 50x – 49 = 0$

(C) $x^2 – 10x + 3 = 0$

(D) $x^2 – 10x + 4 = 0$

(E) $x^2 – 50x – 49 = 0$

6. Which of the following could be the quadratic equation for which one root is $1\frac{1}{2}$ times the other root and the difference between the roots is 1?

(A) $x^2 + 3x + 3 = 0$

(B) $x^2 + 4x + 3 = 0$

(C) $x^2 – 5x + 6 = 0$

(D) $x^2 + x – 6 = 0$

(E) $x^2 – 3x – 3 = 0$

7. If *p* and *q* are the roots of the equation $ax^2 + bx + c = 0$, then what is the value of $p^4 – q^4$? ***(Real NMAT Question)***

(A) $a^4 – b^4 + c^4$

(B) $a^4 + b^4 – c^4$

(C) $\pm\frac{b}{a^4}(b^2 – ac)$

(D) $\pm\frac{b}{a^4}(b^2 – 2ac)$

(E) $\pm\frac{b}{a^4}(b^2 – 2ac)\sqrt{b^2 – 4ac}$

8. If $2(x-1)^3 + 3 \leq 19$, then the value of x must be:

(A) greater than or equal to 3

(B) less than or equal to 3

(C) greater than or equal to –3

(D) less than or equal to –3

(E) less than –3 or greater than 3

9. If $|3a+7| \geq 2a+12$, then

(A) $a \leq -\frac{19}{5}$

(B) $a \geq -\frac{19}{5}$

(C) $a \geq 5$

(D) $a \leq -\frac{19}{5}$ or $a \geq 5$

(E) $-\frac{19}{5} \leq a \leq 5$

10. If *x* is an integer, $\sqrt{192} < x\sqrt{12}$ and $\frac{x}{\sqrt{12}} < \sqrt{12}$ which of the following can be the value of x?

(A) 2

(B) 3

(C) 4

(D) 5

(E) 12

11. If $\left|\frac{a}{b}\right|$ and $\left|\frac{x}{y}\right|$ are reciprocals, then which of the following must be true?

(A) $ab < 0$

(B) $\frac{a}{b}\left(\frac{x}{y}\right) < -1$

(C) $\frac{a}{b} < 1$

(D) $\frac{a}{b} = -\frac{y}{x}$

(E) $\frac{y}{x} > \frac{a}{b}$

12. It costs a certain chair manufacturing unit Rs. 11,000 to operate for one month, plus Rs. 300 for each chair produced during the month. Each of the chairs sells for a retail price of Rs. 700. What is the minimum number of chairs that the manufacturing unit must sell in one month to make a profit?

(A) 26

(B) 27

(C) 28

(D) 29

(E) 30

13. Which of the following describes all possible solutions to the inequality $|p + 5| < 9$?

(A) $p < 4$

(B) $p > -14$

(C) $4 > p > -14$

(D) $-11 > p > 3$

(E) $p > 4$ or $p < -14$

14. If $x^2 - 6x + 9 = 0$, what is the value of x^3? ***(Real NMAT Question)***

(A) –27

(B) –9

(C) 6

(D) 9

(E) 27

15. Manish has 60 marbles that he wants to divide among himself and his 12 friends. The marbles don't necessarily have to be divided equally. If Manish wants to have more marbles than any of his friends, what is the least number of marbles he can have?

(A) 5

(B) 6

(C) 7

(D) 8

(E) 12

16. If $a^2 - b^2 = 0$ and $ab \neq 0$ which of the following must be true? Indicate all such statements.

1. $a = b$
2. $|a| = |b|$
3. $\frac{a^2}{b^2} = 1$

(A) 1 only

(B) 2 only

(C) 3 only

(D) 1 and 2 only

(E) 2 and 3 only

17. If $(x - y) = \sqrt{20}$ and $(x + y) = \sqrt{12}$ what is the value of $x^2 - y^2$?

(A) $2\sqrt{15}$

(B) $4\sqrt{15}$

(C) $3\sqrt{20}$

(D) $6\sqrt{12}$

(E) $2\sqrt{21}$

18. If $ab \neq 0$, $\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} =$

(A) 1

(B) $a - b$

(C) $(a + b)(a - b)$

(D) $(a^2 + b^2)(a^2 - b^2)$

(E) $\frac{a-b}{a+b}2\sqrt{2}$

19. Which of the following is equal to $(a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2$?

(A) $5a^2$

(B) $5a^2 + 10$

(C) $a^2 + 10$

(D) $5a^2 + 6a + 10$

(E) $5a^2 – 6a + 10$

20. a is inversely proportional to b. Also, it is given that a = 24 when b = 2. What is the value of b when a = 6?

(A) –2

(B) –1

(C) 2

(D) 4

(E) 8

21. Three people sit down to eat 14 pieces of cake. If two of the people eat the same number of pieces, and the third person eats two more pieces than each of the other two, how many pieces are eaten by the third person?

(A) 3

(B) 4

(C) 5

(D) 6

(E) 7

22. There are a number of beads of three different colours: red, blue and yellow, and each colour has a different value. If the value of a red bead plus a blue bead is 4.25, the value of a blue bead plus a yellow bead is 2.75, and the value of a red bead plus a blue bead plus a yellow bead is 4.5, what is the value of a red bead plus a yellow bead?

(A) 0.25

(B) 2

(C) 2.25

(D) 2.75

(E) 3

23. National Cricket Academy offers two different pricing packages for cricket coaching. Under the 'Regular' pricing plan, classes can be bought for a flat rate of Rs. 80 per hour. Under the 'Exclusive' pricing plan, after paying an initial fee of Rs. 495, classes can be availed for a rate of Rs. 15 per hour. If Karan buys the 'Exclusive' pricing plan, how many classes does he need to take in order to have spent exactly 40% less than he would have under the 'Regular' plan?

(A) 10

(B) 12

(C) 15

(D) 18

(E) 20

24. A student took a test in which 3 marks were given for each correct answer and 0.5 marks were deducted for an incorrect answer. If the test had 25 questions and the student attempted all the questions and got 40 marks in total, what is the difference between the number of correct and incorrect answers?

(A) 5

(B) 10

(C) 12

(D) 15

(E) 18

25. A group of friends contributed to the cost of a party where each person had to contribute the same integer amount. Since three people did not participate, the remaining people had to pay Rs. 10 more. If the total amount contributed is the minimum value possible, what would be the per person contribution had 10 people contributed to the party?

(A) Rs. 2

(B) Rs. 5

(C) Rs. 6

(D) Rs. 8

(E) Rs. 10

26. If $p + q + r = 0$, where $p \neq q \neq r$, then $\frac{p^2}{2p^2+qr}+\frac{q^2}{2q^2+pr}+\frac{r^2}{2r^2+pq}$ =

(A) 0

(B) 1

(C) –1

(D) pqr

(E) p + q + r

27. Out of a group of swans, seven times half of the square root of the number of swans were seen going away from a bank of a river and only one pair remained in the water. How many swans were there in the group?

(A) 9

(B) 16

(C) 25

(D) 36

(E) 49

28. If $\frac{1}{p}+\frac{1}{q} = m$ and $pq = \frac{1}{n}$, find $\frac{1}{p^2}+\frac{1}{q^2}$

(A) $\frac{1}{m^2}-\frac{2}{n}$

(B) $m^2-\frac{2}{n}$

(C) m^2-2n

(D) $\frac{1}{m^2}-2n$

(E) $\frac{1}{m^2}+2n$

29. Let $f(x + 2) + f(5x + 6) = 2x – 1$ for all real x. Find the value of f(1).

(A) –2

(B) –1

(C) $\frac{-5}{2}$

(D) $\frac{-3}{2}$

(E) None of these

30. For what value of K, the given set of equations would have no solution?

$4x - Ky = -7$ and $5x + 3y = 2$

(A) $\frac{12}{5}$

(B) 0

(C) $\frac{-12}{5}$

(D) $\frac{-6}{5}$

(E) $\frac{6}{5}$

Directions for Questions 31 and 32: Answer the questions based on the following.

The following operations are defined for real numbers.

A @ B = A if A is greater than B else A @ B = B

A % B = AB if A x B is positive else A % B = A

Note that all other mathematical symbols have their usual meanings.

31. [(– 4)@(– 5)]%2

(A) – 8

(B) – 10

(C) – 5

(D) – 4

(E) – 7

32. $\frac{1@-1}{(-K)@(-K)}\%K,\ K \neq 0,\ K \neq 0$

(A) K^2

(B) $\frac{1}{K}$

(C) $\frac{-1}{K}$

(D) 1

(E) Cannot be determined

33. If the sum of the roots of an quadratic equation is $\frac{5}{4}$ times the product of the roots, find the relation between *b* and *c*.

(A) $b = \frac{5}{4}c$

(B) $b = \frac{4}{5}c$

(C) $b = -\frac{5}{4}c$

(D) $b = -\frac{4}{5}c$

(E) $b = -\frac{2}{5}c$

34. Three numbers are in geometric progression such that the product of them is 27 and the sum of the products taken in pairs is 91. What is the third number in the progression? ***(Real NMAT Question)***

(A) $\frac{1}{3}$

(B) 3

(C) 9

(D) 27

(E) $\frac{1}{3}$ or 27

35. Manoj plans to work at a coffee shop during his summer holidays. He will be paid as per the following schedule: at the end of the first week, he will receive Rs. 1,000. At the end of each subsequent week, he will receive Rs. 1,000, plus an additional amount equal to the sum of all payments he has received in the previous weeks. How much money will Manoj be paid in total if he works for 6 weeks at this coffee shop?

(A) Rs. 18,000

(B) Rs. 20,000

(C) Rs. 42,000

(D) Rs. 63,000

(E) Rs. 81,000

36. If the collection of a movie is Rs. 100,000 for the first day, Rs. 120,000 for the second day, Rs. 140,000 for the third day and so on, that is, the collection increases by Rs. 20,000 every day, then find the total collection for the first 10 days.

(A) Rs. 1200,000

(B) Rs. 1400,000

(C) Rs. 1600,000

(D) Rs. 1700,000

(E) Rs. 1900,000

37. If $\log_x a$, $\log_y a$ and $\log_z a$ are in HP, then x, y and z are in ***(Real NMAT Question)***

(A) AGP

(B) AP

(C) GP

(D) HP

(E) Cannot be determined.

38. A person saves Rs. 200 more each year than in the previous year. If he started with Rs. 400 in the first year, how many years would he take to save Rs. 18,000 (excluding interest)?

(A) 10 years

(B) 12 years

(C) 15 years

(D) 18 years

(E) None of these

39. If the second term of a geometric progression is 6 and the fifth term is 48, then what is its tenth term?

(A) 2236

(B) 2146

(C) 1536

(D) 1246

(E) 1146

40. p, q, r and s are any four positive real numbers, the minimum value of $\frac{p}{q}+\frac{q}{r}+\frac{r}{s}+\frac{s}{p}$ is

(A) 0

(B) 1

(C) 2

(D) $2\sqrt{2}$

(E) 4

41. If a, b, c and d are in GP, then $(a^3 + b^3)^{-1}$, $(b^3 + c^3)^{-1}$, and $(c^3 + d^3)^{-1}$ are in

(A) AP

(B) GP

(C) HP

(D) AP or GP

(E) None of these

42. A man pays a rent of Rs. 70 for the first day, Rs. 80 for the second day and so on, with the rent on each day being Rs. 10 more than the rent on the previous day. What is the total rent paid for the first 20 days?

(A) Rs. 2,300

(B) Rs. 2,700

(C) Rs. 3,000

(D) Rs. 3,200

(E) Rs. 3,300

43. In one day, what is the sum of the numbers on which the hour hand of a clock points each time the minute hand is on 12? ***(Real NMAT Question)***

(A) 12

(B) 78

(C) 156

(D) 160

(E) 178

44. If a, b and c are in arithmetic progression, then a + b, b + c, c + a (in any order) can be in ***(Real NMAT Question)***

(A) arithmetic progression.

(B) geometric progression.

(C) harmonic progression.

(D) arithmetic or geometric progression.

(E) arithmetic or geometric or harmonic progression.

45. For a cricket match team selection, 2 batsmen, 3 bowlers, and 1 wicketkeeper are to be picked. There are 23 players available to play as batsmen, 21 other players available to play as bowlers, and 9 other players available to play as wicketkeepers. If the maximum possible number of complete sets of 6 players are formed, how many of the available players will not be on a team?

(A) 7

(B) 9

(C) 11

(D) 13

(E) 15

46. How many five-digit numbers can be formed using the digits 5, 6, 7, 2, 9, 0 if no digits can be repeated?

(A) 64

(B) 120

(C) 240

(D) 600

(E) 720

47. Five friends, Akshita, Binod, Chetan, Dravid, and Eshan are to be arranged in a line. How many such arrangements are possible if Binod is not allowed to stand next to Dravid?

(A) 24

(B) 48

(C) 72

(D) 96

(E) 120

48. On January 1, Ajit put Re 1 in his piggy bank. Every day he puts in Rs 2 more than the total amount of money already in the piggy bank. Which of the following expressions gives the total amount of money in Ajit's piggy bank at the end of January? ***(Real NMAT Question)***

(A) 2^{30}

(B) 2^{31}

(C) $3(2^{30}) - 2$

(D) $3(2^{31}) - 2$

(E) $3(2^{30})$

49. Among three different boxes, 10 identical balls have to be distributed. In how many ways can this be done such that every box has at least 2 balls?

(A) 15

(B) 16

(C) 64

(D) 81

(E) None of these

50. There are 6 equally spaced points A, B, C, D, E and F marked on a circle whose radius is R. How many convex pentagons of distinctly different areas can be drawn using these points as vertices?

(A) ${}^{6}P_{5}$

(B) ${}^{6}C_{5}$

(C) 5

(D) 1

(E) 6

51. One of the management test papers comprises of 9 questions divided equally among three sections, namely section I, section II and section III. There are fifteen different questions available such that there are five questions for every section for designing the test. If no two sections bear a common question, then how many different tests can be designed?

(A) 480

(B) 640

(C) 800

(D) 880

(E) 1,000

52. A shop sells 5 different types of sweets. In how many different ways a total of 8 sweets can be purchased?

(A) 125

(B) 495

(C) 795

(D) 840

(E) 930

53. A box contains 90 balls of different colours: 13 yellow, 19 green, 27 red, 10 black, 7 brown and 14 white. Find the smallest number V such that any V balls drawn from the box will contain at least 14 balls of the same colour.

(A) 69

(B) 70

(C) 72

(D) 76

(E) 79

54. Salim has total 9 friends, 5 girls and 4 boys. In how many ways can Salim invite them for his birthday party, if there have to be exactly 3 girls in the invitees list?

(A) 80

(B) 160

(C) 200

(D) 240

(E) 320

55. There are 12 holes made in the ground. At least 3 are to be filled with a red ball and the other holes can be filled with any colour ball. In how many different ways can all the holes be filled from a box of 5 red balls and 10 mixed colour balls? ***(Real NMAT Question)***

(A) 345

(B) 425

(C) 445

(D) 465

(E) 485

56. If the fourth and ninth terms of a Harmonic Progression are $\frac{1}{10}$ and $\frac{1}{25}$, then find the series. ***(Real NMAT Question)***

(A) $1, \frac{1}{4}, \frac{1}{7} \ldots$

(B) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8} \ldots$

(C) $\frac{1}{3}, \frac{1}{5}, \frac{1}{7} \ldots$

(D) $1, \frac{1}{3}, \frac{1}{7} \ldots$

(E) None of the above

Directions for Questions 57–59: The following table represent the number of players nominated for different cricket teams.

Team	Total Player nominated	Batsmen	Bowler	All rounder
A	20	8	6	6
B	15	10	4	1
C	18	12	3	3

57. In how many ways can a team selector select 6 batsmen from team A?

(A) 18

(B) 20

(C) 24

(D) 28

(E) 30

58. In how many ways a team selector can select 10 players in team B where 6 are bats men, 3 are bowlers and 1 is an all-rounder?

(A) 720

(B) 800

(C) 840

(D) 900

(E) None of these

59. In how many ways a team selector can select 11 players in team C where 8 are bats men, 2 are bowlers and 1 is an all-rounder?

(A) 4,455

(B) 4,545

(C) 4,465

(D) 4,475

(E) None of these

60. Each factor of 210 is written on a piece of paper, and all the pieces of paper are mixed up. If a piece of paper is randomly picked up from this mix, what is the probability that a multiple of 42 is written on the paper?

(A) $\frac{1}{16}$

(B) $\frac{5}{42}$

(C) $\frac{1}{8}$

(D) $\frac{3}{16}$

(E) $\frac{1}{4}$

61. As per a weather forecast, the probability of hail is $\frac{1}{6}$ for any given day next week. What is the chance that there will be hail on both Thursday and Friday?

(A) $\frac{1}{36}$

(B) $\frac{1}{12}$

(C) $\frac{1}{6}$

(D) $\frac{1}{3}$

(E) $\frac{2}{3}$

62. A classroom has 12 girls and 20 boys. $\frac{1}{4}$ of the girls in the class have cell phones. If a child is selected at random from the class, what is the probability that she is a girl who does not have a cell phone?

(A) $\frac{3}{32}$

(B) $\frac{9}{32}$

(C) $\frac{3}{8}$

(D) $\frac{23}{32}$

(E) $\frac{29}{32}$

63. A cube has sides numbered 1 through 6. If the cube is rolled three times, what is the probability that at least one of the rolls will result in a number higher than 4?

(A) $\frac{13}{19}$

(B) $\frac{11}{13}$

(C) $\frac{14}{19}$

(D) $\frac{19}{27}$

(E) $\frac{12}{31}$

64. There is an 80% chance that Deeksha will skip her lunch and 25% chance that there will be a power failure. If these events are independent, what is the probability that Deeksha will skip her lunch OR that there will be a power failure?

(A) 20%

(B) 80%

(C) 85%

(D) 95%

(E) 105%

65. Bag A contains 3 white and 3 red beads. Bag B contains 6 white and 3 red beads. One of the two bags will be chosen at random, and then two beads will be drawn from that bag at random without replacement. What is the probability that the two beads drawn will be of the same colour?

(A) $\frac{7}{20}$

(B) $\frac{9}{10}$

(C) $\frac{9}{20}$

(D) $\frac{11}{20}$

(E) $\frac{13}{20}$

66. Two different unbiased dice are rolled together. What is the probability of getting a sum of more than or equal to 10 after adding the numbers shown on the tops of both the dice?

(A) $\frac{1}{12}$

(B) $\frac{1}{9}$

(C) $\frac{1}{6}$

(D) $\frac{2}{16}$

(E) $\frac{1}{4}$

67. Two apples and five bananas are defective out of 10 apples and 20 bananas contained in a fruit basket. If Sanjeev takes out two fruits at random, what is the probability that either both are bananas, or both are good?

(A) $\frac{119}{435}$

(B) $\frac{338}{435}$

(C) $\frac{841}{870}$

(D) $\frac{217}{870}$

(E) None of these

68. If 'M' and 'N' are two independent events and P(M) = 0.5 and P(N) = 0.4, find P(M/N).

(A) 0.4

(B) 0.5

(C) 0.6

(D) 0.74

(E) 0.88

69. The roll numbers of students in the class are in the range from 100 to 199 (both inclusive). If the teacher selects one student at random, what is the probability that his/her roll number is divisible by 3?

(A) $\frac{1}{5}$

(B) $\frac{32}{99}$

(C) $\frac{33}{100}$

(D) $\frac{2}{3}$

(E) None of these

70. An integer x is chosen at random from the numbers 1 to 50. Find the probability that $x + \frac{336}{X} \leq 50$.

(A) $\frac{7}{10}$

(B) $\frac{17}{25}$

(C) $\frac{19}{50}$

(D) $\frac{13}{50}$

(E) $\frac{3}{10}$

71. In an arithmetic series, the sum of the second term and the fifth term is 24. The sixth term is greater than the third term by 12. What is the first term of the series? ***(Real NMAT Question)***

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

4 DI-Caselets and Tables

Directions for Questions 1–4: The table below* shows the information about number of laptops (figures in 1000s) of different models produced and rejected by a company over six years.

Number of laptops of different models produced and rejected by a company over the years (figures in 1000s)

Laptop model	P		Q		R		S		T	
Year	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected
2010	20	2	50	3	15	0.5	80	5	60	4
2011	35	3	45	2	20	0.55	75	4	58	4
2012	15	0.5	40	2.5	17	0.7	58	2	62	3.5
2013	25	0.25	42	2.3	25	1.5	65	3	40	1.5
2014	30	1.5	48	2.5	30	2	68	3	45	2
2015	27	1.5	41	2.1	26	1.75	72	3.5	50	2.3

*Table for Questions 1–4.

1. In case of Type Q laptop, in which year was the ratio of rejection to production the highest among the given years?

(A) 2010

(B) 2011

(C) 2012

(D) 2014

(E) 2015

2. In which year was the ratio of rejection to production the lowest among the given years for type T laptop?

(A) 2010

(B) 2012

(C) 2013

(D) 2014

(E) 2015

3. What was the difference in Type R laptops rejected between 2011 and 2012?

(A) 150

(B) 200

(C) 250

(D) 2000

(E) 2400

4. The acceptable (not rejected) Type T laptops in 2012 were what percentage of those in 2011?

(A) 8

(B) 14

(C) 106

(D) 108

(E) 110

Directions for Questions 5–8: Refer to the following table and answer the questions that follow:

Number of trousers produced by 5 factories over 5 months of 2016.

Month	Prisma	Shelby	Kooper	Wendy	Caret
Jan	900	850	350	1000	850
Feb	800	700	1050	1100	850
Mar	1050	800	1000	1100	950
Apr	800	850	850	1100	850
May	950	900	1050	1150	850
Total	4500	4100	4300	5450	4350

5. For which factory was the number of trousers manufactured in March the highest percentage of the total number of trousers produced by that factory during the five-month period?

(A) Prisma

(B) Shelby

(C) Kooper

(D) Wendy

(E) Caret

6. The number of trousers manufactured by Wendy in April is what percentage of the number of trousers manufactured by Wendy in January?

(A) 10%

(B) 91%

(C) 110%

(D) 115%

(E) 125%

7. Which of the five factories has the highest ratio of the number of trousers manufactured in April to number of trousers manufactured in February?

(A) Prisma

(B) Shelby

(C) Kooper

(D) Wendy

(E) Caret

8. For which factory was the number of trousers manufactured in February and March together the lowest among the five factories?

(A) Caret

(B) Wendy

(C) Kooper

(D) Shelby

(E) Prisma

Directions for Questions 9–12: Answer the questions on the basis of the information given below.

The table given below* shows the number of two-wheelers (motorised) running on the roads of a country XYZ during the period 2006 – 2010. These are the only type of two-wheelers on the roads of the country.

	2006	2007	2008	2009	2010
VTS	1,120	1,300	1,800	1,900	2,100
SULPAR	194,830	249,200	266,000	325,000	438,200
SCHAPE	35,600	42,300	43,300	49,200	57,000
RHONDA	417,500	479,200	403,400	416,700	471,000
MAHA	143,600	172,600	150,400	162,400	193,800
SICTOR	1,100	1,600	2,300	3,000	2,400
MUZUKI	114,500	137,600	121,700	125,700	158,000
BAJAZ	58,800	65,000	64,900	68,000	80,400
SLOGAN	12,400	14,400	15,000	16,500	21,000

*Table for Questions 9–12.

9. The second highest annual growth over the entire period has been experienced by which of the following two-wheelers:

(A) RHONDA

(B) SICTOR

(C) VTS

(D) SCHAPE

(E) BAJAZ

10. What is the difference between the total numbers of two-wheelers on the roads of the country from the year 2007 to year 2009?

(A) 4,900

(B) 4,500

(C) 5,100

(D) 5,200

(E) 5,400

11. What is the approximate percentage of RHONDA two-wheelers out of the total number of two-wheelers on the roads of the country in the year 2008?

(A) 30%

(B) 33.33%

(C) 35%

(D) 38%

(E) 45%

12. What is the average number of two-wheelers running on the roads of the country in the year 2008?

(A) 118,756

(B) 118,765

(C) 119,576

(D) 181,756

(E) 191,756

Directions for Questions 13–15: Read the information given below and answer the questions that follow.

The table given at the bottom* of this page depicts the marks obtained by 1,000 students in English and Computer Science in an entrance exam conducted by JET (Junior Entrance Test)

13. What is the difference between the percentage of students who secured more than 60% marks in aggregate and those who secured more than 40% marks in aggregate?

(A) 0%

(B) 27%

(C) 46%

(D) 54%

(E) 73%

14. What is the total number of students securing more than 20 marks in English and 40 marks in Computer Science?

(A) 40

(B) 70

(C) 260

(D) 840

(E) Cannot be determined

15. The percentage of the number of students securing more than 60% marks in Computer Science is approximately what percent of those getting more than 40% marks in aggregate?

(A) 20%

(B) 29%

(C) 31%

(D) 36%

(E) 42%

Directions for Questions 16–19: The following table** shows the number of people employed in public and private sector in a country in the years 2005, 2006, 2007 and 2008. All the values are in '000. ***(Real NMAT Question)***

16. What is the ratio of private sector employment to public sector employment in 2008?

(A) 14 : 25

(B) 14 : 23

(C) 7 : 11

(D) 2 : 31

(E) 7 : 10

17. What is the difference of yearly growth rate in employment between 2006 – 2007 and 2007 – 2008?

(A) 0.0002

(B) 0.0003

(C) 0.0006

(D) 0.0007

(E) 0.0009

18. What percentage of the total employment did the private sector contribute in 2006?

(A) 31.9%

(B) 32.2%

(C) 32.3%

(D) 32.6%

(E) 32.7%

19. What percentage of the total employment did the public sector contribute in 2007?

(A) 64.9%

(B) 65.2%

(C) 66.0%

(D) 66.2%

(E) 66.7%

Subject \ Marks out of 50	>40	>30	>20	>10	>0
English	90	320	800	920	1,000
Computer Science	40	210	660	810	1,000
Average marks per subject	70	270	730	870	1,000

*Table for Questions 13–15.

	Public Sector				Private Sector			
Year	Central Govt	State Govt	Quasi Govt		Local Bodies	Large Estt.	Small Estt.	Total
			Central	State				
2005	2,938.5	7,201.9	3,284.7	2,463.6	2,117.9	7,489.1	962.7	26,458.4
2006	2,860.0	7,300.0	3,469.0	2,440.0	211.0	7,804.0	1,001.0	26,992.0
2007	2,800.0	7,209.9	3,447.0	2,414.0	2,132.0	8,229.0	1,046.0	27,277.0
2008	2,739.0	7,171.0	3,389.0	2,407.0	1,968.0	8,832.0	1,043.0	27,549.0

**Table for Questions 16–19.

Directions for Questions 20–23: The following table gives the percentage breakdown of the total marks obtained by 5 students A, B, C, D and E in 6 subjects, P, Q, R, S, T and U, of their final exams. The maximum marks in each subject are 100 and every student got an integral score. ***(Real NMAT Question)***

	P	Q	R	S	T	U
A	10	14	22	14	18	22
B	12	17	20	19	15	17
C	15	10	20	15	20	20
D	15	17	19	25	14	10
E	16	18	16	18	18	14

20. What can be the maximum possible total score achieved by any of these 5 students?

(A) 450

(B) 500

(C) 550

(D) 580

(E) 600

21. If the pass mark in each subject is 20 and each student passed in all subjects, then what can be the minimum total score obtained by any of the 5 students?

(A) 120

(B) 150

(C) 175

(D) 200

(E) 250

22. What can be the maximum possible total score for C?

(A) 400

(B) 450

(C) 500

(D) 550

(E) 600

23. If out of these 5 students, E scored the highest marks in subject S, then his total score in all six subjects is definitely more than how many students?

(A) 0

(B) 1

(C) 2

(D) 3

(E) 4

Directions for Questions 24–27: Go through the following information and answer the questions based on it.

An experiment was conducted to study the effect of acid rain on five species of aquatic animals that were released in a lake. The original pH of the lake was 6.5. ***(Real NMAT Question)***

Effect of Acid Rain on Aquatic Species

Aquatic Species	Number Released at pH 6.5	pH Tolerance of Different Aquatic Species					
		pH 6.5	pH 6.0	pH 5.5	pH 5.0	pH 4.5	pH 4.0
Trout	24	✓	✓	✓	✓	×	×
Bass	82	✓	✓	✓	×	×	×
Perch	40	✓	✓	✓	✓	✓	×
Frog	73	✓	✓	✓	✓	✓	✓
Clam	12	✓	✓	×	×	×	×

✓ Indicates pH levels which can be tolerated

× Indicates pH levels which cannot be tolerated

24. Approximately how many times greater is the total number of aquatic animals that will most likely not survive when the pH changes from 6.5 to 4 than the total number of aquatic animals that will most likely not survive when the pH changes from 6.5 to 4.5?

(A) 0.5 times

(B) 1.3 times

(C) 2.5 times

(D) 1 times

(E) 7.5 times

25. The pH of the lake first decreased because of acid rain from 6.5 to 4.5, and then the pH was increased artificially from 4.5 to 5.5. If 12 aquatic animals of each species were then introduced into the lake at pH 5.5, how many species would most likely record greater than 60% change in the number of animals at pH 5.5 over pH 6.5?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

26. Assuming that the original pH level of the lake was 6.5, at what pH level would approximately 59.3% of the original number of aquatic animals that were released in the lake most likely survive?

(A) pH 6.0

(B) pH 5.5

(C) pH 5.0

(D) pH 4.5

(E) pH 4.0

27. If the pH of the lake decreases from 6.5 to 4.5 because of acid rain, what percentage of the total number of aquatic animals that were released into the lake at pH 6.5 are expected to survive?

(A) 17.32%

(B) 23.10%

(C) 31.60%

(D) 48.92%

(E) 52.64%

Directions for Questions 28–30: Read the information given below and answer the questions that follow.

The table below* depicts the number of students of five engineering colleges A, B, C, D and E who were placed in different companies during campus placement drives.

Colleges	Mechanical Engineering		Electrical Engineering		Electronics Engineering	
	Total Students	Selected	Total Students	Selected	Total Students	Selected
A	60	40	60	24	50	15
B	60	30	60	36	50	35
C	60	24	60	30	50	40
D	60	35	60	18	50	25
E	60	18	60	12	50	42

*Table for Questions 28–30.

28. What is the approximate percentage of students of college C who got selected during campus placement drives?

(A) 45%

(B) 50%

(C) 55%

(D) 60%

(E) 65%

29. What is the percentage of Mechanical Engineering students from all the colleges who got selected during campus placement drives?

(A) 40%

(B) 44%

(C) 49%

(D) 51%

(E) 53%

30. What is the total number of students of Electrical Engineering from all the colleges who got selected during campus placement drives?

(A) 100

(B) 110

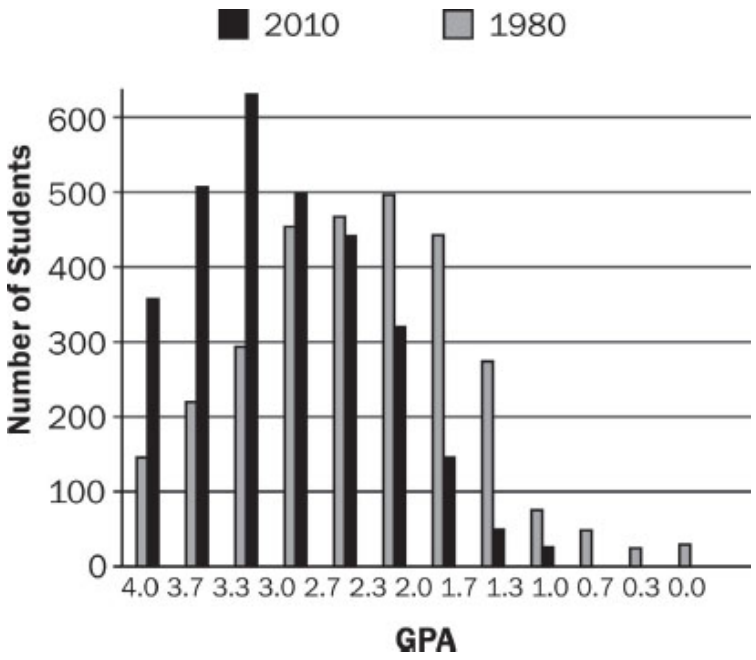
(C) 120

(D) 130

(E) 136

5 DI-Graphs and Charts

Directions for Questions 1–4: Refer to the following graph and answer the questions.



Comparison of GPAs of 3000 students in 1980 and in 2010

1. What was the mode for the GPA among the 3,000 students in 2010?

(A) 3.7
(B) 3.3
(C) 3.0
(D) 2.7
(E) 2.3

2. What was the median GPA among the 3,000 students in 1980?

(A) 3.7
(B) 3.3
(C) 3.0
(D) 2.7

(E) 2.3

3. Approximately what percentage of the students in 2010 earned at least a 3.0 GPA?

(A) 25%

(B) 50%

(C) 67%

(D) 80%

(E) 97.5%

4. Approximately what percentage of the students in 1980 earned a GPA less than 3.0?

(A) 33%

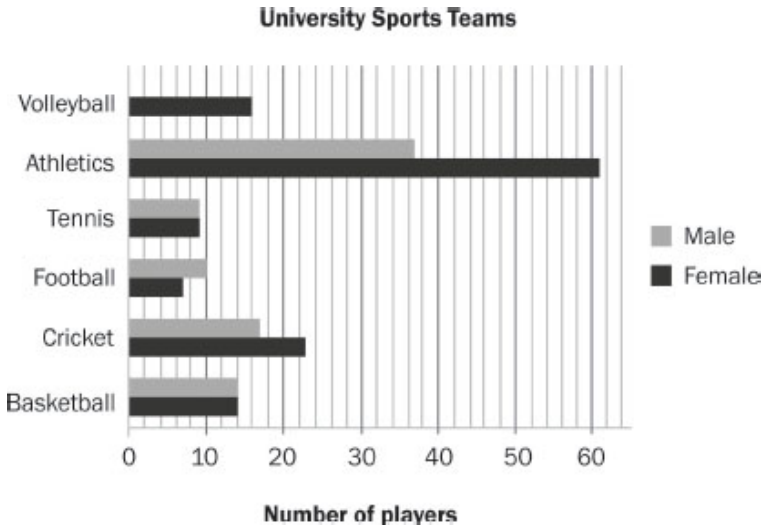
(B) 37.5%

(C) 50%

(D) 62.5%

(E) 75%

Directions for Questions 5–8: Go through the given graph and solve the questions based on it.



5. What is the ratio of male players to female players on the Athletics team?

(A) 37 : 61

(B) 9 : 17

(C) 16 : 23

(D) 14 : 19

(E) 61 : 37

6. All players, except those in Athletics and Cricket teams, are a part of only one team. If there are a total of 76 male players in different university sports teams, how many male players are in both Athletics team and Cricket team?

(A) 11

(B) 17

(C) 37

(D) 54

(E) 76

7. In which of the following university sports team(s) do male players outnumber female players?

(A) Athletics, Tennis and Football

(B) Cricket

(C) Football and Cricket

(D) Football

(E) Tennis and Athletics

8. What is the ratio of female tennis players to male basketball players on the university sports teams?

(A) 5 : 14

(B) 9 : 14

(C) 7 : 18

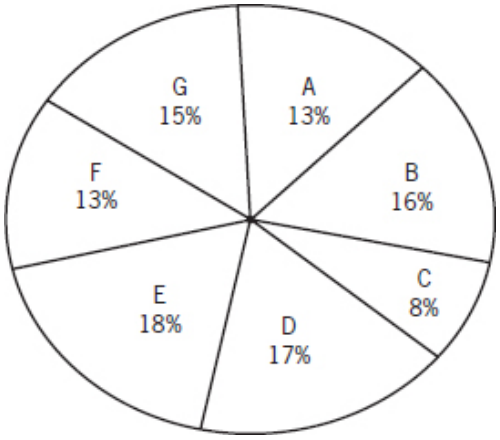
(D) 14 : 9

(E) 18 : 7

Directions for Questions 9–12: Study the following chart to answer the question given below:

Town	Percentage of Population Below Poverty Line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Percentage distribution of the population of seven towns of the state in 2005.



9. In 2006, the populations of Town A and Town B each increased by 10% as compared to 2005. If the population of Town A in 2005 was 5,000 and the percentage of the population living below the poverty line for all seven towns in 2006 remains the same as in 2005, which of the following is the approximate population of Town B below the poverty line in 2006?

(A) 2,500

(B) 3,000

(C) 3,500

(D) 4,000

(E) 4,500

10. In 2007, the population of Town D increased by 10% as compared to 2005 and the population of Town G reduced by 5% as compared to 2005. If the population of Town G in 2005 was 9,000, what is the total population of Towns D and G in 2007?

(A) 19,200

(B) 19,770

(C) 19,870

(D) 19,970

(E) None of these

11. If in 2005 the total population of the seven towns together was approximately 55,000, what will be the approximate population of Town F in that year below the poverty line.

(A) 2,500

(B) 3,000

(C) 3,500

(D) 4,000

(E) 4,500

12. The population of Town C is 2,000 in 2005. What will be the ratio of the population of Town C below the poverty line to that of Town E below the poverty line in that year?

(A) 207 : 76

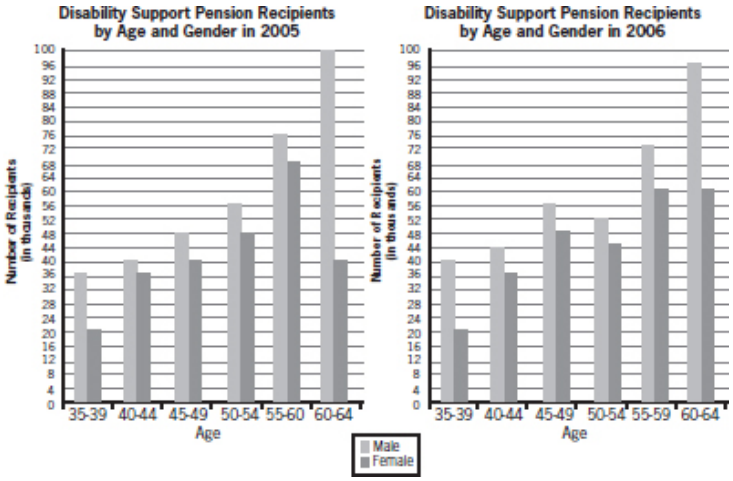
(B) 76 : 207

(C) 152 : 207

(D) 76 : 307

(E) 87 : 207

Directions for Questions 13–16: Go through the given graphs and solve the questions based on them. ***(Real NMAT Question)***



13. What is the approximate percentage increase in the number of recipients in the 60–64 age group between 2005 and 2006?

(A) 5.5%

(B) 10.2%

(C) 11.4%

(D) 16%

(E) 45%

14. In each year, there was a total of 150,000 recipients in the three age groups that are immediately before 45–49. What was the approximate percentage decrease in the number of recipients in the 30–34 age group from 2005 to 2006?

(A) 6%

(B) 7%

(C) 18%

(D) 44%

(E) 80%

15. What is the approximate percentage decrease in the total number of recipients aged above 49 years and below 65 years from 2005 to 2006?

(A) 1%

(B) 4.2%

(C) 5.1%

(D) 7.8%

(E) 100%

16. The number of male recipients between the age of 35 and 69 decreased by 5% from 2005 to 2006. If there were 20,000 male recipients in the age group of 65-69 in the year 2006, how many male recipients were in the same age group in the year 2005?

(A) 8,000

(B) 10,000

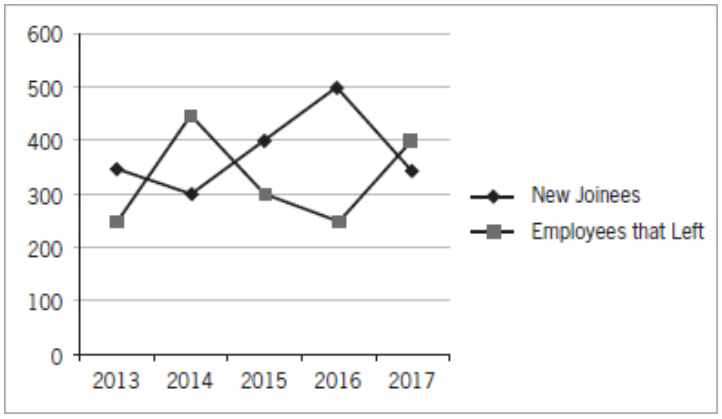
(C) 18,000

(D) 20,000

(E) 44,000

Directions for Questions 17–19: Answer the questions on the basis of the information given below.

The line graph below depicts the number of employees who left the company ABC Pvt. Ltd. and the number of new joinees in that year. Also, it is known that the number of employees in the year 2012 was 2,000.



17. What was the percentage change in number of employees in the company from the year 2012 to year 2013?

(A) 2%

(B) 3%

(C) 4%

(D) 5%

(E) Data insufficient

18. In which of the following years was the number of employees in ABC Pvt. Ltd. the maximum?

(A) 2014

(B) 2015

(C) 2016

(D) 2017

(E) None of these

19. In which of the following two years was the number of employees in ABC Pvt. Ltd. the same?

(A) 2013 and 2017

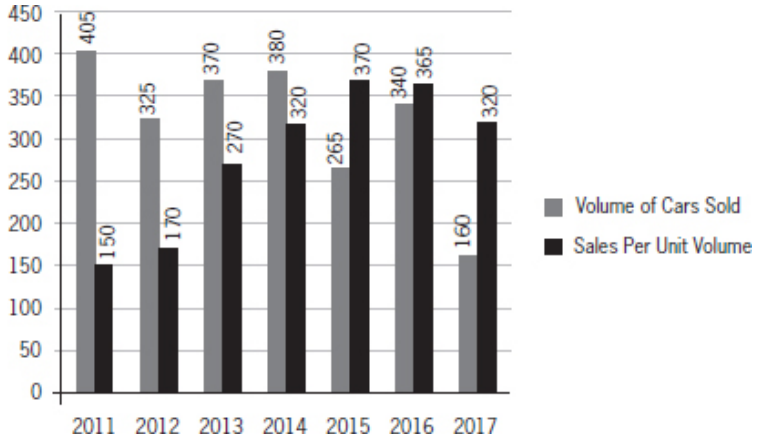
(B) 2013 and 2015

(C) 2016 and 2017

(D) 2014 and 2017

(E) None of these

Directions for Questions 20–22: Answer the questions on the basis of the information given below.



The bar chart represents the volume of cars sold in a particular year and the sales per unit volume of a particular year.

20. By what percentage is the total volume of sales in the year 2015 greater/smaller than that in 2011?

(A) 45.6%

(B) 50.3%

(C) 54.2%

(D) 61.4%

(E) 66.67%

21. What is the difference between the average of the volume of cars sold and that of the sales per unit volume for the whole period?

(A) 40.00

(B) 41.57

(C) 43.21

(D) 45.12

(E) 50.73

22. In how many of the years, the trend is such that when there is an increase in volume sold over the previous year, then there is a decrease in the sales per unit volume over the previous year and vice versa?

(A) 1

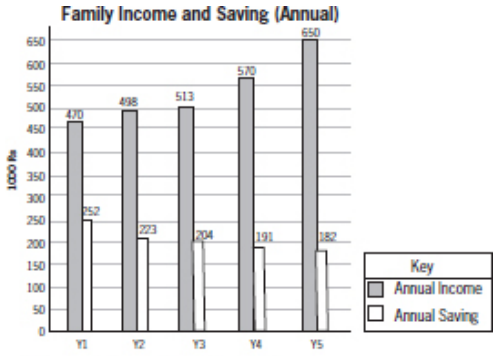
(B) 2

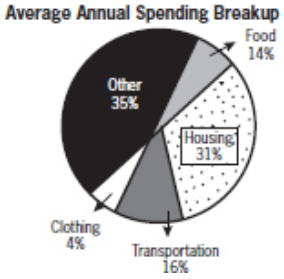
(C) 3

(D) 4

(E) 5

Directions for Questions 23 to 26: Go through the given graphs and solve the questions based on them. ***(Real NMAT Question)***





23. The annual family spending in the year preceding Y1 was Rs. 150,000. Which year recorded the lowest percentage increase in the annual family spending over the preceding year?

(A) Y1

(B) Y2

(C) Y3

(D) Y4

(E) Y5

24. What was the total increase in the amount of money the family spent annually on buying food and clothing in Y2 over Y1?

(A) Rs. 10,260

(B) Rs. 20,520

(C) Rs. 28,980

(D) Rs. 39,240

(E) Rs. 49,500

25. In which year did the family spend a total of exactly Rs. 60,640 on transportation?

(A) Y1

(B) Y2

(C) Y3

(D) Y4

(E) Y5

26. On which item did the family spend between Rs. 1 lakh and Rs. 1.2 lakh annually in Y4?

(A) Food

(B) Housing

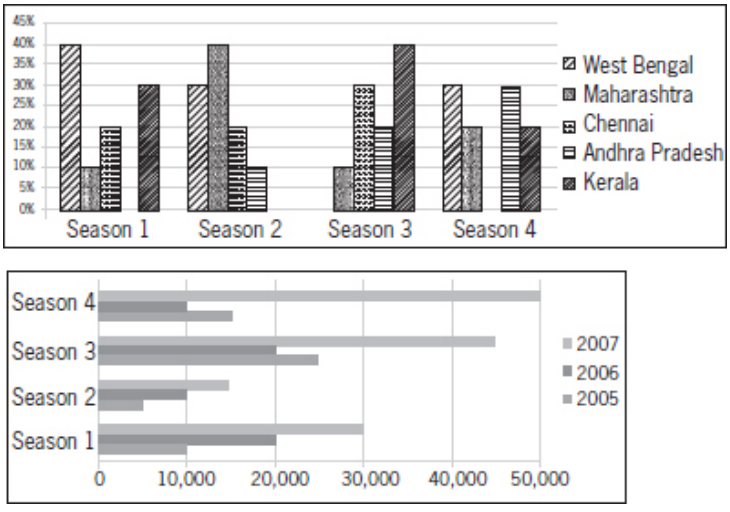
(C) Transportation

(D) Clothing

(E) Other

Directions for Questions 27–30: Go through the following graphs and answer the questions based on them.

The given bar graphs represent the runs scored by the Karnataka Ranji team in domestic cricket. Bar chart 1 gives the details of the runs scored by Karnataka against each of the 5 states as a percentage of the total runs scored by Karnataka. Chart 2 gives the details of the runs scored in each of the four seasons of three different years. ***(Real NMAT Question)***



Assume that the percentage break up of the runs scored against each state in each season was the same for all three years.

27. Against which state did the Karnataka team score the maximum runs in the year 2005?

(A) Kerala

(B) Chennai

(C) Maharashtra

(D) West Bengal

(E) Andhra Pradesh

28. What was the percentage change in the runs scored against Chennai from 2005 to 2006?

(A) 14.3%

(B) 17.2%

(C) 18.2%

(D) 20.2%

(E) 33.2%

29. In which year and season did the runs scored against Maharashtra show the maximum change over the previous season in the year?

(A) Season 3, year 2005

(B) Season 4, year 2005

(C) Season 2, year 2006

(D) Season 2, year 2007

(E) Season 4, year 2007

30. Which of the following is the maximum difference between the runs scored against any two states in any season?

(A) 12,000

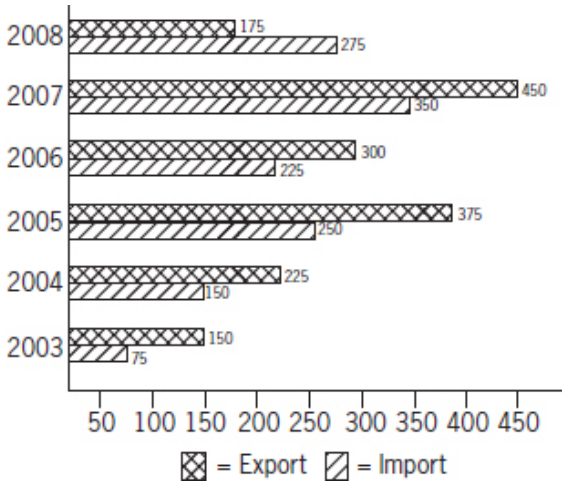
(B) 13,000

(C) 14,500

(D) 15,500

(E) 18,000

Directions for Questions 31–34: Use the following chart, which represents the value of exports and imports (in Rs. hundred crore) of a country for a certain period, to answer the given questions. ***(Real NMAT Question)***



31. During which year is the percentage increase/decrease in imports from the previous year the lowest?

(A) 2003

(B) 2004

(C) 2005

(D) 2006

(E) 2007

32. What is the ratio of total imports to total exports for all the given years together?

(A) 35 : 36

(B) 36 : 83

(C) 38 : 37

(D) 53 : 67

(E) 53 : 87

33. During which period is the total value of import equal to the total value of export (in Rs. hundred crore)?

(A) 2003–04

(B) 2004–07

(C) 2005–07

(D) 2006–08

(E) 2007–08

34. What percentage is the total export in the years 2003, 2006 and 2008 taken together of the total import for the same period?

(A) 109%

(B) 110%

(C) 111%

(D) 112%

(E) 113%

6 Data Sufficiency

Directions for Questions 1 to 31: A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

(A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.

(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.

(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

(D) EACH statement ALONE is sufficient.

(E) Statements (1) and (2) TOGETHER are NOT sufficient.

1. Three-fourths of the boys in a class are intelligent and there are 18 intelligent boys in the class. What is the number of girls in the class? ***(Real NMAT Question)***

(1) Boys comprise two-thirds of the total number of students in the class; the rest are girls.

(2) The number of girls is less than the number of boys.

2. In a group of 150 students, find the number of girls. ***(Real NMAT Question)***

(1) Each girl was given 50 paisa, while each boy was given 25 paisa to purchase goods totaling Rs. 49.

(2) Girls and boys were given 30 paisa each to buy goods totaling Rs. 45.

3. What percentage of a group of people are men with MBA degrees?

(1) Of all the men in the group, 25% have MBA degrees.

(2) Of all the women in the group, 30% have MBA degrees.

4. In a classroom, one student is to be selected at random to solve a question. What is the probability that a girl will be selected?

(1) Two-fifths of the students in the classroom are boys.

(2) 15 of the students in the classroom are boys.

5. Is x^2 + y3 odd? ***(Real NMAT Question)***

(1) $x^2y = 48$

(2) $xy^2 = 36$

6. If a is an integer, is a + 1 even?

(1) a + 2 is an even integer.

(2) a – 1 is an odd integer.

7. If Udit saved Rs. 1200 of his earnings last month, how much did Udit earn last month?

(1) Uditspent $\frac{1}{2}$ of his earnings last month on household expenses and saved $\frac{1}{4}$ of the remainder.

(2) Of his earnings last month, Udit paid twice as much in rent as he saved.

8. Water is pumped into a partially filled swimming pool at a constant rate through an inlet pipe. At the same time, water is pumped out of the pool at a constant rate through an outlet pipe. At what rate, in litres per minute, is the amount of water in the pool increasing?

(1) The amount of water initially in the pool is 500 litres.

(2) Water is pumped into the pool at a rate of 50 litres per minute and out of the pool at a rate of 20 litres every 4 minutes.

9. What is the price of tea?

(1) The price of coffee is Rs. 5 more than that of tea.

(2) The price of coffee was Rs. 5 less than the price of a cold drink, which cost three times the price of tea.

10. What is the cube root of y?

(1) The 7th root of y is 12.

(2) The 22nd root of y is 2.

11. In triangle ABC, if AB = x units, BC = x + 4 units, and AC = y units, which of the three vertex angles of triangle ABC has the greatest degree measure?

(1) $y = x + 8$

(2) $x = 4$

12. What percentage of Debating club members enrolled at a certain school are from India?

(1) Of the Indian students enrolled at the school, 20% are members of the Debating club.

(2) Of the non-Indian students enrolled at the school, 45% are members of the Debating club.

13. If the sequence S has 150 terms, what is the 121st term of S ?

(1) The first term of S is 32.

(2) The 138th term of S is 1248, and each term of S after the first is 18 more than the preceding term.

14. What is the selling price of the mixture if the ratio of the two qualities of tea mixed is 3:4? ***(Real NMAT Question)***

(1) Cost price of the first quality of tea is Rs. 180 per kg.

(2) Cost price of the second quality of tea is Rs. 225 per kg.

15. What is the number of trailing zeros when P! is converted to base 'x'? ***(Real NMAT Question)***

(1) $100 < P < 105$

(2) 'x' can be 53 or 59.

16. The absolute difference between a two digit number and the number formed by reversing the digits of that number is D. What is the number?

(1) D = 36

(2) The sum of the digits of the number is 12.

17. Who is the shortest among the five friends A, B, D, E and F?

(1) D is taller than F but shorter than A and F is not the shortest.

(2) E is shorter than B.

18. If a, b and c are digits, is (a + b + c) a multiple of 9? (A digit can be one of the integers 0, 1, 2, 3, 4, 5, 6,7, 8 or 9.)

(1) The three digit number abc is a multiple of 9.

(2) [(a × b) + c] is a multiple of 9.

19. What is the value of X, if X is an integer?

(1) $X = \sqrt{9}$

(2) $X^2 - 1 < 0$

20. Is parallelogram ABCD a rhombus?

(1) The four triangle enclosed by the diagonals and the sides have equal areas.

(2) A circle can be inscribed in ABCD touching all the four sides.

21. Is a = b = c = 1?

(1) $a^2 + b2 + c2 = ab + bc + ca$

(2) $a^2 + b2 = 2c2$

22. Pipe A can fill a tank in 'a' hours and pipe B can fill the same tank in 'b' hours. If both the pipes are opened together for 2 hours, then what is the volume (in cc) of water in the tank after 2 hours?

(1) a = 6 and b = 8

(2) Volume of the tank is 100 cc

23. Four lectures Arithmetic, Biology, Chemistry and Dermatology were scheduled, one on each day on four consecutive days, but not necessarily in that order. On which day was Chemistry scheduled?

(1) The first lecture was scheduled on Monday, 14th January 2016 and was followed by Dermatology.

(2) Arithmetic was not scheduled on 16th January 2016 and there was a gap of one day between Arithmetic and biology.

24. Are the integers A and B co-primes? ***(Real NMAT Question)***

(1) The numbers A and B are the squares of two successive even numbers.

(2) Both A and B are distinct primes.

25. Ramu and Somu were born into a family who had worked in the textile business for generations. While their ancestors believed that a zero clash of professional interests could be ensured only by family members taking up different segments of the textile business, the two brothers felt that if they both worked on the same segment, complementing each other but engaging in healthy competition, it would bring about brighter business prospects. Both of them stocked and sold the same merchandise and often bought textile goods from the same source, though not necessarily on the same terms and conditions.

The two brothers bought 4 items of antique artefacts to decorate their showroom. However, on persistent requests from customers, both sold the two pieces each had kept. Whose transaction resulted in a better profit? ***(Real NMAT Question)***

(1) Ramu sold one item at p% profit and the other at p% loss though he had bought both items at the same price.

(2) Somu made q% profit on one item and on the other q% loss though he sold both items at the same price.

26. A taxi charges 50 dollars when the distance is less than or equal to 300 metres and 'A' dollars for each additional 100 metres. Kamal hires a taxi from city P to city Q. Manik Lal hires a taxi from city Q to city R. If Mahesh hires a taxi from city P to city R via city Q, how much did Mahesh need to pay for the taxi? ***(Real NMAT Question)***

(1) Kamal pays 75 dollars.

(2) Manik Lal pays 95 dollars.

27. The sum of the ages of three persons A, B and C is 167 years. What is the age of B? ***(Real NMAT Question)***

(1) B is $\frac{17}{12}$ times as old as A.

(2) C is 44 years older than A.

28. Anshuman bought two articles from a sale and sold them to his friend Ankit. Did Anshuman make a profit or a loss? ***(Real NMAT Question)***

(1) Anshuman sold both the articles at the same price.

(2) Of the two articles sold, Anshuman made a profit of p% on one and incurred a loss of p% on the other.

29. Sunita sold article A at x% profit. Find the price at which she bought A. ***(Real NMAT Question)***

(1) If Sunita sold A at (x − 10)% profit, her profit would have been Rs. 12 less.

(2) If Sunita sold A at (x + 20)% profit, her profit would have been Rs. 24 more.

30. Find the value of $\frac{x^3}{y^2+1}$. ***(Real NMAT Question)***

(1) $\frac{x^2}{y^2}=\frac{1}{4}$

(2) $\frac{x}{y}=\frac{1}{2}$

31. If Kriti paid a total of Rs. 1,350 for two dresses and sold one at 6% loss and the other at 7.5% profit, what was the price she paid for each dress? ***(Real NMAT Question)***

(1) Kriti made neither a profit nor a loss from the transaction.

(2) Kriti sold one dress for Rs. 705.