COMPETENCY BASED QUESTIONS
SUBJECT: APPLIED MATHEMATICS
CLASS: XI

1. These are 20 students in an accountancy class and 30 students in an applied maths class. Find the number of students which are either in accountancy class or applied maths class in the following cases.
   (i) Two classes meet at the same period.
   (ii)The two classes met at different periods and ten students are enrolled in both the courses.
2. Out of 280 students in class XII of a school, 135 play Hockey, 110 play football, 80 play volleyball, 35 of these play hockey and football, 30 play volleyball and hockey, 20 play football and volleyball. Also, each student play at least one of the three games. How many students play all the three games?
3. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.
4. There are 210 members in a club. 100 of them drink tea and 65 drink tea but not coffee, each member drinks tea or coffee. Find how many drink coffee how many drink coffee, but not tea.
5. In a survey of 25 students, it was found that 15 had taken applied mathematics, 12 had taken economics and 11 had taken business studies, 5 had taken applied mathematics and business studies, 9 had taken applied mathematics and economics, 4 had taken economics and business studies and 3 had taken all three subjects. Find the no. of students that had taken
   (i) only business studies
   (ii)only applied mathematics
   (iii) only economics
   (iv) economics and business studies but applied mathematics
   (v)applied mathematics and economics but not business studies
   (vi) only one of the subjects
   (vii) at least one of three subject
   (viii)None of three subjects.
6. In the year 2001 census, the population of India was found to be 8.7×10^7. If the population increases at the rate of 2.5 % every year, what would be the population in 2021?
7. The population of a town in the year 2014 was 150,500. If the annual increase in population during the three successive years be at the rate of 7%, 8% and 6% respectively, find the population at the end of 2017?
8. The bacteria in a culture grow by 7% in the first hour, decreases by 6% in the second hour and again increases by 5% in the third hour. If at the end of third hour, the count of bacteria is 11,270,000, find the original count of bacteria in the sample.
9. A new car costs Rs. 360, 000. Its price depreciates at the rate of 15% in a year. What will be the price of the car after 5 years?
10. A new car costs Rs. 360,000. Its price depreciates at the rate of 10 % a year during the first two years and at the rate of 20% a year thereafter. What will be the price of the car after 10 years?
11. The value of a Xerox machine depreciates by 11% annually. If its present value is Rs. 38,440, find its value three years ago.
12. A and B together can dig a pond in 20 days. They worked together for 8 days and then B leaves the work. How long will A take to finish the work if A alone can dig the pond in 30 days?
13. A and B together can build a wall in 30 days. If A is twice as good a workman as B, in how many days will A alone finish the work?

14. A man covers a distance at 4 km/h in 3 hour 30 minutes. How much time will he take to cover the same distance at 21 km/h?
15. A man shall be 45 minutes late to reach his office, if he walks from his house at 4 km/hr. He shall be 30 minutes early if he walks at 6 km/hr. Find the distance between his house and office.
16. Seven boys A, B, C, D, E, F and G are standing in a straight line facing towards North. If F is to the immediate left of D. G is between A and E. F and A have one boy between them. E and C have two boys between them. C and B have three boys between them.
    (i) Write the standing arrangement.
    (ii) Who is third to right of E?
    (iii) Who are the neighbours of C?
    (iv) How many boys are standing between B and F?
    (v) Which boy is standing exactly in the middle?
17. Seven friends A, B, C, D, E, F and G are playing cards sitting around a circular table facing towards centre. F is second to the right of G. B is neighbour of F but not of C. E is neighbour of C and sitting fourth at the right of G. D is sitting between E and A.
    (i) Write the seating arrangement.
    (ii) Who is fourth to the left of G?
    (iii) Who is sitting left of G?
    (iv) Who are the neighbours of F?
    (v) Who are the neighbours of B?
18. At the end of each year the value of a certain machine has depreciated by 20 % of its value at the beginning of that year. If its initial value was Rs 1250, find the value at the end of 5 years.
19. Three friends whose ages form a GP divide a certain sum of money in proportion to their ages. If they do that three years later, when the youngest is half the age of the oldest, then he will receive 105 rupees more than he gets now, and the middle friend will get 15 rupees more than he gets now. Find the ages of the friends.
20. In a family, there are 6 persons A, B, C, D, E and F. They are entrepreneur, lawyer, teacher, manager, doctor and engineer. The doctor is the grandfather of F, who is an entrepreneur. The engineer D is married to A. C the manager is married to lawyer.
    (i) What is the profession of B?
    (ii) What is the profession of E?
    (iii) How is A related to E?
    (iv) How is D related to F?
    (v) How many female members are there in the family?
21. A family of Ravi, Rekha, Gaurav, Saurabh, Payal, Mohit, Monika, Swasti and Shaurya consists of 3 generations. Ravi is husband of Rekha and has 2 sons and one daughter Payal. Mohit is Rekha's son-in-law. Saurabh is Payal's brother and Monika's brother-in-law. Gaurav has two children. Answer the following:
    (i) How is Gaurav related to Mohit?
    (ii) How is Saurabh related to Ravi?
    (iii) How is Ravi related to Shaurya?
    (iv) How is Mohit related to Payal?
    (v) How is Mohit related to Swasti?

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