Bengaluru City University

FOURTH Semester (NEP) Open Elective

Quantitative Mathematics

Model Paper- 1

Time: $2\frac{1}{2}$ Hours

Max Marks: 60

$5 \times 3 = 15$

I Answer any five questions.
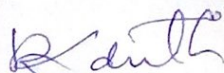
1. Find the L.C.M of 34 and 46

2. Rationalize $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$

3. Find the cube of 21952 by prime factorization method.

4. Find the value of $6^0 + 64^{\frac{1}{2}} + 8^{\frac{1}{3}}$

5. The sum of 6 times a number and 5 times a number is 66, find the number?

6. Find roots for the equation $m^2 - 2m + 2 = 0$

7. A car travels a distance of 500 km in 10 hours. What is its speed in km/hr?

$3 \times 5 = 15$

II Answer any three questions

8. Find the LCM of 219, 1321, 2320 and 8526.

9. Simplify $\frac{4^5 \times 64^3 \times 2^4}{8^6 \times 128^2}$

10. If $\frac{5+3\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$ find $3b - 2a$

11. If $x = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ and $y = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ find the value of $x + xy + y$

12. If $a = b^c, b = c^a, c = a^b$ Show that $abc = 1$

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III Answer any three questions $3 \times 5 = 15$

13. Solve the equation $\frac{x}{5} + \frac{5}{x} = \frac{x}{6} + \frac{6}{x}$

14. Solve the equation $3(4x + 1) - (4x - 1) = 2(x + 5)$

15. For what value of 'm' will the equations $3x^2 + 12x + m = 3$ have equal roots? and find the roots.

16. Find the value of 'K' satisfying the pair of equations

    $4x - 3y = 9$ & $2x + Ky = 11$

17. The age of the father is 4 times that of his son. Five years ago father was 7 times as old as his son. Find their present ages.

IV. Answer any three questions $3 \times 5 = 15$

18. If 'x' is 5% of 'y' and 'y' is 24% 'z'. If 'x'= 480 find the value of 'y' and 'z'.

19. A car reached a certain place 'Q' from 'P' in 35 minutes with an average speed of 69 km/hr. If the average speed is increased by 36 km/hr, then how long will it take to cover the same distance?

20. Sita can finish a 100 page document in 9 hours, Sneha in 6 hours and Rita in 12 hours. How long they take to type a 100 page document if they work together.

21. 12 Men and 6 women can do a piece of work in 14 days, while 8 men and 9 women can do the same work in 16 days. If a man gets Rs 54 per day, what should be the wage of a woman per day?

22. Two trains are running in opposite directions with the same speed. If the length of each train is 135 meters and they cross each other in 18 seconds. what is the speed of each train?

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Model Paper- 2

Time: $2\frac{1}{2}$ Hours
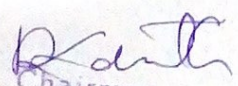
Max Marks: 60

I. Answer any five questions.

$5 \times 3 = 15$

1. If $\frac{4}{7}$ of a number is 84 then find the number

2. Multiply $3\sqrt{2} - 5\sqrt{3}$ and $6\sqrt{3} + \sqrt{7}$

3. Solve for 'x' if $2x + 3 \le -5 - 2x$ where $x \in I$

4. Solve $4x - 4y = 24$ and $x - 4y = 3$

5. Solve $9x^2 - 3x - 2 = 0$ by using formula method.

6. Travelling at a speed of 50 km/ hr. How long is it going to take to travel 60 km

7. If 'A' can do a piece of work in 10 days and 'B' can do a same work in 15 days.

   then how many days will they take to do the same work if they work together.

II. Answer any three questions

$3 \times 5 = 15$

8. If the HCF and LCM of two numbers are 3 and 60 respectively and one number

   is 12, then find the other number.

9. If $a^x = 25, b^y = 36$ and $c^z = 49$ then show that $ax + by + cz = 36$

10. If $5 + 2\sqrt{6} = (\sqrt{a} + \sqrt{b})^2$ then find the value of 'a' and 'b'

11. Find the simplest form of the surd $\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1}$

12. Find the value of $\sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}$

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III. Answer any three questions

$3 \times 5 = 15$

13. Solve the equation $\dfrac{4t}{t^2-25} = \dfrac{1}{5-t}$

14. Solve the equation $\dfrac{1}{x-2} + \dfrac{2}{x-1} = \dfrac{6}{x}$

15. Solve $5x - 3y = 7$ & $x + 8y = 10$ by method of cross multiplication

16. The sum of ages of a son and father is 56 years after 4 years the age of the father will be 3 times that of the son. Find their ages

17. 'A' is 2 years older than 'B', who is twice as old as 'C'. If the total of the ages of A, B & C be 27, then how old is 'B'

IV. Answer any three questions

$3 \times 5 = 15$

18. The salary of a worker is Rs.2000. If it is first increased by 10% and then decreased by 10%. What is the change in his salary?

19. The average weight of P, Q, and R is 50 kg. If average weight of P and Q is 55kg and that of Q and R is 43 kg. Find the weight of Q.

20. If 3 men or 4 women can complete a certain job in 43 days, how long 7 men and 5 women will can complete the job.

21. A train passes a pole in 15 seconds and passes a platform 100 meter long in 25 seconds. Find the length of the train.

22. Find the angle between the hour hand and the minute hand of a clock when the time is 4 hours 35 minutes.

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Quantitative Mathematics

Model Paper- 3

Time: $2\frac{1}{2}$ Hours
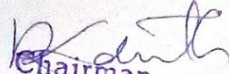
Total Marks: 60

$5 \times 3 = 15$

I.   Answer any Five Questions.

1. What fraction must be added to $\frac{5}{8}$ so that the sum is $\frac{43}{24}$

2. Find the HCF of 372, 954 and 1728

3. Find 'x' if $4^{2x} = \frac{1}{32}$

4. Simplify $(2\sqrt{2} + 7\sqrt{3})(\sqrt{2} - 3\sqrt{3})$

5. Solve for 'x' and 'y' if $4x - y = 2$ $\&$ $-3x + 2y = 1$

6. The salary of Rohith is increased from 3500 to 4025. Find the increased percentage.

7. A person covers a certain distance at a speed of 60 km/hr. and returns at a speed of 40 km/hr. find the average speed for the whole journey.

$3 \times 5 = 15$

II.   Answer any three questions

8. Find the HCF of 36.54, 48.42 and 58.41

9. If $3^x \times 3^x \times 9^{2y} = 27$ $\&$ $2^x + 4^{-y} = \frac{1}{8}$ then find the value of x and y.

10. Simplify $2 + \sqrt{2} + \frac{1}{2+\sqrt{2}} + \frac{1}{\sqrt{2}-2}$

11. Check whether 99992 is divisible by 8

12. If 1 is added to the denominator of a fraction, the fraction becomes $\frac{1}{2}$. If 1 is added to the numerator of the fraction, the fraction becomes 1. Then find the fraction.

$3 \times 5 = 15$

III. Answer any three questions

13. The weekly wages of 30 persons consisting men and women amounts to Rs 190. Each man receives Rs 7 and each woman receives Rs 5 Find the number of men and women.

14. Solve $5(x-2)^2 - 6 = -13(x-2)$

15. Solve using elimination method $4x - 3y = 8$ & $3x - 4y = -1$

16. A father is twice as old as is daughter. If 20 years ago the age of the father was 10 times the age of the daughter. What is the present age of the father?

17. The sum of the ages of a daughter and mother is 56 years. After 4 years the age of the mother will be 3 times that of the daughter. What are the ages of the daughter and the mother?

IV. Answer any three questions

$3 \times 5 = 15$

18. A cyclist travels at 10 km/hr. for 2 hours and then at 13 km/hr. for 1hour find his average speed.

19. A bus travels for 7 hours, the first half at 30 km/hr. and the second half at 40 km/hr. find the distance travelled by the bus

20. A & B can do a work in 15 days, B & C in 20 days, C & A in 12 days. In how many days can they complete it if they work together?

21. A train 110 meters in length passes a man, walking at the speed of 6 km/hr. against it in 6 seconds. What is the speed of the train in km/hr.?

22. What was the day of the week on 26ᵗʰ January 1950?

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