2024

(NEP—2020)

(1st Semester Repeater)

MATHEMATICS

(Multi-disciplinary Course)

(Quantitative Aptitude)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

Use of Simple Calculator is allowed

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick ☑ the correct answer in the boxes provided : 1×10=10

1. The missing number in the series 780, ___?___, 736, 681, 604, 505, is

(a) 769 ☐ *(b)* 791 ☐

(c) 757 ☐ *(d)* 790 ☐

2. What percent of 6·5 litres is 130 ml?

(a) 20 ☐ *(b)* 2 ☐

(c) 200 ☐ *(d)* 0·2 ☐

3. If $(2x \quad 3y) : (3x \quad 5y) \quad 18 : 29$, then the value of $x : y$ is

(a) 4 : 3 ☐

(b) 2 : 5 ☐

(c) 3 : 4 ☐

(d) 3 : 5 ☐

4. A bus covers a distance of 2924 km in 43 hours. Then the speed of the bus is

(a) 60 km/hr ☐

(b) 68 km/hr ☐

(c) 78 km/hr ☐

(d) 80 km/hr ☐

5. Speeds of a boat along the current and against the current are 14 km/hr and 7 km/hr respectively. What is the speed (in km/hr) of the current?

(a) 3·5 ☐

(b) 1·5 ☐

(c) 2·5 ☐

(d) 3 ☐

6. The data that can be calculated and has an infinite number of probable values that can be selected within a given specific range is called

(a) nominal data ☐

(b) ordinal data ☐

(c) discrete data ☐

(d) continuous data ☐

7. Two pipes N and Q can fill a water tank in 90 hours and 10 hours respectively. If they are opened together, then in how many hours will the tank be filled?

(a) 18 ☐ *(b)* 9 ☐

(c) 6 ☐ *(d)* 20 ☐

8. The size of each class in a grouped frequency distribution table is called

(a) width ☐

(b) range ☐

(c) class interval ☐

(d) mean ☐

9. The difference between the maximum and minimum value of the observation in a data set is called

(a) frequency ☐

(b) mean ☐

(c) range ☐

(d) class interval ☐

10. The formula for finding the central angle of a component in a pie chart is

(a) $\frac{\text{sum of values of component}}{\text{value of the component}}$ 360 ☐

(b) $\frac{\text{value of the component}}{\text{sum of values of component}}$ 360 ☐

(c) $\frac{\text{value of the component}}{360}$ sum of values of component ☐

(d) None of the above ☐

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

Answer *five* questions, taking at least *one* from each Unit : 5×5=25

UNIT—I

1. If 9^{86} 8^{39} 72^{44} 9^{39} 8^{86} 72^{x}, then find the value of x.

2. Sixty-five percent of a number is 21 less than four-fifth of that number. What is that number?

3. If the cost price is 96% of the selling price, then what is the profit percent?

UNIT—II

4. *A* is twice as good as workman as *B* and together they finish a piece of work in 18 days. In how many days will *A* alone finish the work?

5. A cyclist cover a distance of 750 m in 2 min 30 sec. What is the speed in km/hr of the cyclist?

6. A cistern has two taps which fill it in 12 minutes and 15 minutes respectively. There is also a waste pipe in the cistern. When all the three are opened, the empty cistern is full in 20 minutes. How long will the waste pipe take to empty the full cistern?

UNIT—III

7. What are the different types of frequency distribution?

8. The scores (out of 100) obtained by 35 students in a mathematics test are as follows :

69, 48, 84, 58, 28, 73, 23, 48, 18, 58, 84, 66, 64, 71, 94, 69, 36, 83, 66, 69, 31, 81, 71, 73, 69, 66, 16, 64, 58, 64, 39, 69, 8, 90, 34

Construct a grouped frequency distribution table with width 10 of each class starting from 0–9.

9. Draw a bar graph for the given data set :

Favourite Color	*No. of Students*
Red	25
Blue	23
Pink	14
Green	28
Brown	10

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

Answer *four* questions, taking at least *one* from each Unit : 10×4=40

UNIT—I

1. *(a)* A man's wage was reduced by 50%. Again the reduced wage increased by 50%. Find his loss in terms of percentage. 5

(b) A retailer buys 40 pens at the marked price of 36 pens from a whole-seller. If he sells these pens giving a discount of 1%, then what is the profit percent? 5

2. *(a)* When 20% of a number is added to another number, the number increased by 50%. What is the respective ratio between the first and second number? 5

(b) *A*, *B*, *C* enter into a partnership. *A* invests 3 times as much as *B* invests and *B* invests two-third of what *C* invests. At the end of the year, the profit earned is ₹ 6,600. What is the share of *B*? 5

3. *(a)* A certain sum of money amount to ₹ 1,008 in 2 years and to ₹ 1,164 in $3\frac{1}{2}$ years. Find the sum and the rate of interest. 5

(b) Find the compound interest on ₹ 10,000 in 2 years at 4% per annum, the interest being compounded half-yearly. 5

UNIT—II

4. *(a)* A person reaches his destination 40 minutes late if his speed is 3 km/hr and reaches 30 minutes before time if his speed is 4 km/hr. Find the distance of his destination from his starting point. 5

(b) If two pipes function simultaneously, the reservoir will be filled in 12 hours. The second pipe fills the reservoir 10 hours faster than the first. How many hours does it take for the second pipe to fill the reservoir? 5

5. *(a)* Describe the different types of data and the different methods of collection of data. 5

(b) 45 men can complete a work in 16 days. Six days after they started working, 30 more men joined them. How many days will they now take to complete the remaining work? 5

6. *(a)* The speed of a boat downstream is 150% more than its speed upstream. If the time taken by the boat for going 80 km downstream and 50 km upstream in 8·2 hours, then what is the speed (in km/hr) of the boat downstream? 5

(b) One-third of a certain journey was covered at the speed of 20 km/hr, one-fourth at 30 km/hr and the rest at the speed of 50 km/hr. Find the average speed per hour for the whole journey. 5

UNIT—III

7. Various modes of transport used by students in a given school are given below :

School Bus	*Private Bus*	*Bicycle*	*Rickshaw*	*On Foot*
350	245	210	175	280

Represent the above data by a pie chart and answer the following questions : 10

(a) What is the central angle corresponding to the total number of students for Private Bus?

(b) What percent (approx) of students use Rickshaw?

(c) What is the ratio of students using School Bus to students using Bicycle?

8. Given below is the information which represents the number of hours per week that Rahul plays outdoor games :

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
No. of hours	3	2	2	1	2	6	4

Construct a cumulative and relative frequency distribution table. 10

9. *(a)* Make a multiple bar diagram of the following data : 5

Academic Streams	*Number of Students*		
	2021–22	*2022–23*	*2023–24*
Arts	600	550	500
Science	400	500	600
Commerce	200	250	300

(b) The following table gives the number of hours people spend using their smart phones daily :

Interval (hours)	0–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8
Frequency	1	1	15	12	6	2	8	5

Draw a frequency polygon for the given data. 5

★ ★ ★