2025

(NEP—2020)

(2nd Semester)

MATHEMATICS

(Multi-disciplinary Course)

(Quantitative Aptitude)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. What number should come in the next in the series 2, 1, ½, ¼, ...?

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

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

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

(d) $\frac{1}{10}$ ( )

2. The product of $2\sqrt{2}$ and $3\sqrt{2}$ is

(a) 6 ( )

(b) 8 ( )

(c) 10 ( )

(d) 12 ( )

3. The percentage of water in the mixture of 2 litre of alcohol and 3 litre of water is

(a) 60% ( )

(b) 50% ( )

(c) 55% ( )

(d) 65% ( )

4. The distance covered by speed 5 m/s during one minute is

(a) 0·1 km ( )

(b) 0·2 km ( )

(c) 0·3 km ( )

(d) 0·4 km ( )

5. 40 workers complete repairing 100 meter road in 50 days. How many workers may finish the same work in 40 days?

(a) 50 ( )

(b) 60 ( )

(c) 70 ( )

(d) 80 ( )

6. A pipe connected with tank or cistern, that fills it, is known as

(a) inlet ( )

(b) outlet ( )

(c) both inlet and outlet ( )

(d) neither inlet nor outlet ( )

7. Choose the odd one from the following primary data collection method :

(a) Questionnaire ( )

(b) Magazine ( )

(c) Interview ( )

(d) Survey ( )

8. A bar graph is used to show

(a) comparison between different groups of data without changes over time ( )

(b) comparison between different groups of data with changes over time ( )

(c) numerical data distribution across the range of values ( )

(d) categorical data showing the portion of a whole divided into a portion ( )

9. Pie chart is used for

(a) comparison between different groups of data without changes over time ( )

(b) comparison between different groups of data with changes over time ( )

(c) numerical data distribution across the range of values ( )

(d) categorical data showing the portion of a whole divided into a portion ( )

10. Histogram is used for

(a) comparison between different groups of data without changes over time ( )

(b) comparison between different groups of data with changes over time ( )

(c) numerical data distribution across the range of values ( )

(d) categorical data showing the portion of a whole divided into a portion ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

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

UNIT—I

1. Rationalize $\frac{1}{\sqrt{235}}$.

2. Alfred buys an old scooter for ₹ 4,700 and spends ₹ 800 on its repair. If he sells the scooter for ₹ 5,800, find his gain percent.

3. A firm consists of three partners *A*, *B* and *C*. Their capital contributions are in the ratio 3 : 2 : 1. The total profit for the year is ₹ 1,80,000. Calculate the share of each partner in the profit.

UNIT—II

4. A man travelled 12 km at speed of 4 km/hr and further 10 km at speed of 5 km/hr. Find his average speed.

5. A man can do a work in 20 days and a woman in 15 days. If they work on it together for 5 days, find the fraction of the remaining work.

6. A boat can travel with a speed of 13 km/hr in still water. If the speed of stream is 4 km/hr, find the time taken by the boat to go 68 km downstream.

UNIT—III

7. Explain data representation and different types of graphical data representation.

8. What is meant by a variable? Explain two of its kinds.

9. Make a frequency distribution table, taking the class intervals as 160–165, 165–170, etc. for the given data :

161, 150, 154, 165, 168, 161, 154, 162, 150, 151, 162, 164, 171, 165, 158, 154, 156, 172, 160, 170, 153, 159, 161, 170, 162, 165, 166, 168, 165, 164, 154, 152, 153, 156, 158, 162, 160, 161, 173, 166, 161, 159, 162, 167, 168, 159, 158, 153, 154, 159

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

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

UNIT—I

1. Write the simple and compound interest formulae, and find—

(a) the sum of money, if simple interest on a certain sum of money is ₹ 4,016·25 at 9% per annum in 5 years;

(b) the compound interest on ₹ 12,600 for 2 years at 10% per annum compounded annually. 5+5=10

2. *(a)* *A* and *B* together have ₹ 1,210. If $\frac{4}{15}$ of *A*'s amount is equal to $\frac{2}{5}$ of *B*'s amount, how much amount does *B* have? 5

(b) Two numbers are respectively 20% and 50% more than a third number. Find the ratio of the two numbers. 5

3. In how many years will a sum of ₹ 800 at 10% per annum compounded annually become ₹ 926·1? 10

UNIT—II

4. Write a note on primary data collection method. 10

5. Write a note on secondary data collection method. 10

6. Write a note on classification of data. 10

UNIT—III

7. Tabulate the following raw data :

Out of a total number of 10000 candidates who applied for jobs in a government department, 6854 were males, 3146 were graduates and others are under-graduates. The number of candidates with some experience was 2623 of whom 1860 were males. The number of male graduates was 2012. The number of graduates with experience was 1093 that includes 323 females. 10

8. Given below are the marks obtained in Mathematics by a batch of 48 students of a school at the Board Examination, 1996 :

43	34	43	32	87	35	71	65	12	52	19	48
17	24	52	65	40	54	62	45	2	13	18	49
57	21	64	71	45	81	52	40	35	78	43	45
44	55	79	37	19	14	8	66	15	24	56	22

(a) Construct a frequency distribution with class intervals of 10 marks. 5

(b) Draw the cumulative frequency distribution of both less than and greater than types. 5

9. *(a)* The following data presents proposed expenditure by a State Government for the year 1997–98 :

Items	*Agriculture & Rural Development*	*Industries & Urban Development*	*Health & Education*	*Miscellaneous*
Proposed Expenditure (in million ₹)	4,200	1,500	1,000	500

Draw a pie chart for this information. 5

(b) Following is the frequency distribution of total marks obtained by the students of different sections of BA :

Marks	100–150	150–200	200–300	300–500	500–800
Number of Students	60	100	100	80	180

Draw a histogram for the distribution above. 5

★ ★ ★