

2025

( NEP—2020 )

( 3rd Semester )

**MATHEMATICS**

( Multi-disciplinary Course )

( **Quantitative Aptitude** )

(Regular & Repeater)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

( **SECTION : A—OBJECTIVE** )

( Marks : 10 )

Put a Tick (✓) mark against the correct answer in the brackets provided :

1×10=10

1. What is the percentage of ratio 5 : 4?

(a) 85% ( )

(b) 100% ( )

(c) 115% ( )

(d) 125% ( )

2. The exponential form of  $\sqrt{2}$  is

(a)  $2^2$  ( )

(b) 2 ( )

(c)  $2^{1/2}$  ( )

(d)  $\sqrt{2}$  ( )

3. Choose the correct answer :

(i) Profit = Selling price - Cost price

(ii) Discount = Selling price - Market price

(a) Both (i) and (ii) are correct ( )

(b) Only (i) is correct ( )

(c) Only (ii) is correct ( )

(d) Neither (i) nor (ii) is correct ( )

4. A person crosses a 600 meters long path in 5 minutes. What is his speed?

(a) 7.2 km/hr ( )

(b) 7.2 km/minute ( )

(c) 7.2 m/sec ( )

(d) 7.2 m/minute ( )

5. The simple interest on ₹ 8000 for 15 months at ₹ 6 per month is

(a) ₹ 7000 ( )

(b) ₹ 7200 ( )

(c) ₹ 7400 ( )

(d) ₹ 7600 ( )

6. A pipe connected with a tank or cistern for filling and emptying it is known as

(a) inward and outward tap ( )

(b) intake and outtake ( )

(c) inlet and outlet ( )

(d) None of the above ( )

7. In water, the direction along and against the stream is called

(a) downward and upward ( )

(b) inward and outward ( )

(c) instream and outstream ( )

(d) downstream and upstream ( )

8. A categorical data with no inherent order or ranking is called

(a) quantitative data ( )

(b) ordinal data ( )

(c) nominal data ( )

(d) None of the above ( )

9. In pie chart, the size of each slice is directly proportional to

(a) the quality it represents ( )

(b) the quantity it represents ( )

(c) Both (a) and (b) ( )

(d) Neither (a) nor (b) ( )

10. The width of histogram and gaps between bars indicate

(a) the spread of the data ( )

(b) the quality of the data ( )

(c) the quantity of the data ( )

(d) None of the above ( )

( SECTION : B—SHORT ANSWERS )

( Marks : 25 )

Answer five questions, selecting at least one from each Unit :

5×5=25

UNIT—I

1. A fruit seller had some apples. He sells 40% apples and still has 420 apples. What is the total number of apples he had originally?
2. A shopkeeper takes 10% profit on his goods. He lost 20% of his goods to the thief. What is his loss percentage?
3. Mr. A and Mr. B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and Mr. A's share is ₹ 855, what is their total profit?

UNIT—II

4. A Boeing covers certain distance at a speed of 240 km/hr in 5 hours. To cover the same distance in  $\frac{5}{3}$  hours, what will be the speed of the Boeing?
5. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?
6. A motor boat, whose speed is 15 km/hr in still water, goes 30 km downstream and comes back in a total of 4 hours 30 minutes. What is the speed of the stream?

UNIT—III

7. Write short notes on qualitative and quantitative data collection methods.
8. Compare questionnaire and scheduled methods of data collection.

9. Make a frequency distribution table, taking the class intervals as 150–155, 155–160, etc., for the given data :

161, 150, 154, 165, 168, 161, 154, 162, 150, 151, 162, 164, 171,  
165, 158, 154, 156, 172 and 160

( SECTION : C—DESCRIPTIVE )

( Marks : 40 )

Answer *four* questions, selecting at least *one* from each Unit :

10×4=40

UNIT—I

1. Compare simple and compound interests. Find the simple interest rate for ₹ 25,000 to become ₹ 31,000 in 48 months. Also, find the compound interest rate per annum for ₹ 1200 to become ₹ 1348.32 during 2 years. 10
2. (a) A tank is filled in 5 hours by three pipes. The last pipe is twice as fast as second, and second is also twice as fast as first pipe. How much time will first pipe alone take to fill the tank? 5
- (b) Pipes A and B can fill a tank in 5 hours and 6 hours respectively. Pipe C can empty it in 12 hours. If all pipes are opened together, how much time will be taken to fill the tank? 5
3. (a) Mr. A, Mr. B and Mr. C subscribe ₹ 50,000 for business. Mr. A subscribes ₹ 4000 more than Mr. B, and Mr. B subscribes ₹ 5000 more than Mr. C. Out of the total profit ₹ 35,000, how much Mr. A will receive? 5
- (b) Mr. X and Mr. Y started a business in partnership investing ₹ 20,000 and ₹ 15,000 respectively. After 6 months, Mr. Z joined them with ₹ 20,000. What will be Mr. Y's share in total profit ₹ 25,000 earned at the end of 2 years from starting of the business? 5

[ Contd.

## UNIT—II

4. (a) A man completes a journey in 10 hours. He travels first-half of the journey at the rate of 21 km/hr and second-half at the rate of 24 km/hr. How far does he travel in the whole journey? 5
- (b) Mr. A alone can do a piece of work in 6 days and Mr. B alone can do it in 8 days. They undertook to do it for ₹ 3,200. With the help of Mr. C, they complete the work in 3 days. How much is needed to pay to C? 5
5. Write notes on data condensation and summarization. 10
6. Write a note on the classification of data. 10

## UNIT—III

7. Given below are the ages of 48 villagers who are infected by Covid-19 on July 2021 :

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 table for ages, using class intervals of 10 years. 5
- (b) Plot the cumulative frequency showing 'less than' and 'greater than' distributions. 5
8. (a) The monthly income of a family is ₹ 10,800. The monthly budget is given below :

Items	Rent	Food	Education	Clothing	Savings
Expenses (in ₹)	2,700	2,400	1,800	1,500	2,400

Draw the pie chart of the above data. 5

- (b) Draw a histogram for the following data distribution : 5

Class interval	50-60	60-70	70-80	80-90	90-100	100-110
Frequency	30	25	45	15	20	40

9. (a) In a batch of 400 students, the height of students is given in the following table. Represent it through a frequency polygon :

<i>Height (in cm)</i>	<i>Number of students</i>
140-150	74
150-160	163
160-170	135
170-180	28
<i>Total</i>	400

- (b) Draw a bar graph for the following table that shows the favourite colour of 200 students in a class :

5

<i>Favourite colour</i>	<i>Red</i>	<i>Green</i>	<i>Blue</i>	<i>Yellow</i>	<i>Orange</i>
<i>Number of students</i>	45	17	50	48	40

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