

MT

2018 ____ ____ 1100

Seat No.

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MT - MATHEMATICS (71) Algebra - SEMI PRELIM - I - PAPER - II

Time : 2 Hours

(Pages 6)

Max. Marks : 40

Q.1. (A) Solve the following : (Any 4)

4

- Write the following ratio in the reduced form
Radius to the diameter of a circle.
- In the following table, the information is given about the number of families and the siblings in the families less than 14 years of age. Find the mode of the data.

No. of siblings	1	2	3	4
Families	15	25	5	5

- Observe the table given below. Check and decide, whether the individuals have to pay income tax

Sr. No.	Individuals	Age	Taxable income (₹)	Will have to pay income tax or not
1.	Miss. Nikita	27	₹ 2,34,000	
2.	Mr. Desilva	81	₹ 4,50,000	

- For the following numbers write the ratio of first number to second number in the reduced form: 36, 90
- Mukund's yield for 7 years was 10, 7, 5, 3, 9, 6, 9. Find the mean of yield per acre:
- If 90% of income is used for daily expense 3% is deposited in bank. How much percent of income is held in hand?

Q.1. (B) Solve the following : (Any 2)

4

- Compare the following pair of ratios: $\frac{9.2}{5.1}$, $\frac{3.4}{7.1}$

2. In a basket there are 10 tomatoes. The weight of each of these tomatoes in grams is as follows 60, 70, 90, 95, 50, 65, 70, 80, 85, 95. Find the median of the weights of tomatoes.
3. Alka spends 90% of the money that she receives every month, and saves ₹ 120. How much money does she get monthly?

Q.2. (A) Solve the following :

4

1. The sequence $-10, -6, -2, 2, \dots$
 - (A) is an A.P., Reason $d = -16$
 - (B) is an A.P., Reason $d = 4$
 - (C) is an A.P., Reason $d = -4$
 - (D) is not an A.P.
2. If the Face Value of a share is ₹ 100 and Market value is ₹ 75, then which of the following statements is correct ?
 - (A) The share is at premium of ₹ 175
 - (B) The share is at discount of ₹ 25
 - (C) The share is at premium of ₹ 25
 - (D) The share is at discount of ₹ 75

3.

Distance covered per litre (km)	12-14	14-16	16-18	18-20
No. of cars	11	12	20	7

The median of the distances covered per litre shown in the above data is in the group

- (A) 12-14
 - (B) 14-16
 - (C) 16-18
 - (D) 18-20
4. What is the sum of first 30 natural numbers?
 - (A) 464
 - (B) 465
 - (C) 462
 - (D) 461

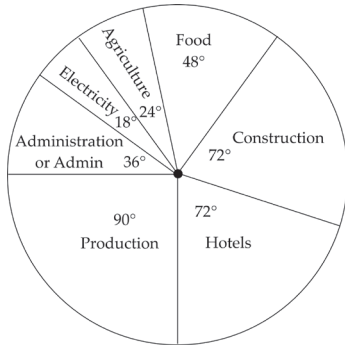
Q.2. (B) Solve the following : (Any 2)

4

1. Find the 27th term of the following A.P.
9, 4, -1, -6, -11, ...

... 3 ...

2. A trader from Surat, Gujarat sold cotton clothes to a trader in Rajkot, Gujarat. The taxable value of cotton clothes is ₹ 2.5 lacs. What is the amount of GST at 5% paid by the trader in Rajkot?
3. The pie diagram shows the proportions of different workers in a town. Answer the following questions with its help.



- (i) If the total workers is 10,000; how many of them are in the field of construction?
- (ii) How many workers are working in the administration?

Q.3. (A) Solve the following activity : (Any 2)

4

1. In the following table, the toll paid by drivers and the number of vehicles is shown. Find the mean of the toll by 'assumed mean' method.

Toll (₹)	300-400	400-500	500-600	600-700	700-800
No. of Vehicles	80	110	120	70	40

Solution:

Assumed Mean (A) = 550

Toll collected (in rupees)	Class Mark (x_i)	$d_i = x_i - A = x_i - \square$	No. of vehicles (f_i)	$f_i d_i$
300 - 400	350	<input type="text"/>	80	-16000
400 - 500	450	-100	110	<input type="text"/>
500 - 600	<input type="text"/> ← A	0	120	0
600 - 700	650	<input type="text"/>	70	<input type="text"/>
700 - 800	<input type="text"/>	200	40	8000
Total			$N = \sum f_i = 420$	$\sum f_i d_i = \square$

... 4 ...

$$\begin{aligned}\bar{d} &= \frac{\sum f_i d_i}{\sum f_i} \\ &= \frac{\boxed{}}{420} \\ &= \boxed{}\end{aligned}$$

$$\begin{aligned}\text{Mean } (\bar{x}) &= A + \bar{d} \\ &= 550 + \boxed{} \\ &= 521.43\end{aligned}$$

∴ **Mean of the money collected is ₹ 521.43.**

2. Smita has invested ₹ 12,000 and purchased shares of FV ₹ 10 at a premium at ₹ 2. Find the number of shares she purchased. Complete the given activity to get the answer.

Solution:

Face value = ₹ 10, Premium = ₹ 2

$$\begin{aligned}\therefore \text{Market value} &= \text{Face value} + \boxed{} = \boxed{} + \boxed{} \\ &= \boxed{}\end{aligned}$$

$$\therefore \text{No. of Shares} = \frac{\text{Total Investment}}{\text{Market value}}$$

$$= \frac{-12000}{\boxed{}}$$

$$= \boxed{}$$

∴ Smita has purchased $\boxed{}$ shares.

3. Write the correct number in the given boxes from the following A.P.

1, 8, 15, 22,

Solution:

Here, $a = \boxed{}$, $t_1 = \boxed{}$, $t_2 = \boxed{}$, $t_3 = \boxed{}$, ...

$$t_2 - t_1 = \boxed{} - \boxed{} = \boxed{}$$

$$t_3 - t_2 = \boxed{} - \boxed{} = \boxed{}$$

$$\therefore d = \boxed{}$$

Q.3. (B) Solve the following : (Any 2)

4

1. In an A.P. 17th term is 7 more than 10th term. Find the common difference?
2. Find the purchase price of a share of FV ₹ 100 if it is at premium of ₹ 30. The brokerage rate is 0.3%.
3. In the following table, the investment made by 210 families is shown. Present it in the form of a histogram.

Investment (Thousand ₹)	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
No. of families	30	50	60	55	15

Q.4. Solve the following : (Any 3)

9

1. The following table shows the information regarding the milk collected from farmers on a milk collection centre and the content of fat in the milk, measured by a lactometer. Find the mode of fat content.

Content of fat (%)	2 - 3	3 -4	4 -5	5 -6	6 -7
Milk collected (Litre)	30	70	80	60	20

2. In the natural numbers from 10 to 250, how many are divisible by 4?
3. Prashant bought 50 shares of FV ₹ 100, having MV ₹. 180. Company gave 40% dividend on the shares. Find the rate of return on investment.
4. Smt. Malhotra purchased solar panels for the taxable value of ₹ 85,000. She sold them for ₹ 90,000. The rate of GST is 5%. Find the ITC of Smt. Malhotra. What is the amount of GST payable by her ?

Q.5 Solve the following : (Any 1)

4

1. Shri. Aditya Sanghavi invested ₹ 50,118 in shares of FV ₹ 100, when the market value is ₹ 50. Rate of brokerage is 0.2% and Rate of GST on brokerage is 18%, then How many shares were purchased for ₹ 50,118?

... 6 ...

2. The following table shows the average rainfall in 150 towns. Show the information by a frequency polygon.

Average rainfall (cm)	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
No. of towns	14	12	36	48	40

Q.6 Solve the following : (Any 1)

3

1. The production of electric bulbs in different factories is shown in the following table. Find the median of the productions.

No. of bulbs produced (Thousands)	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of factories	12	35	20	15	8	7	8

2. Prepare Business to Consumer (B2C) tax invoice using given information. Write the name of the supplier, address, state, Date, invoice number, GSTIN etc. as per your choice. Supplier : M/s Address State Date
- Invoice No. GSTIN
- Particulars - Rate of Mobile Battery - ₹ 200 Rate of GST 12% HSN 8507,
1 pc.
Rate of Headphone - ₹ 750 Rate of GST 18% HSN 8518,
1 pc.

Best of Luck 🍀