

# MT

2018 \_\_\_\_ \_\_\_\_ 1100

Seat No.

--	--	--	--	--	--	--	--

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

Time : 2 Hours

(Pages 6)

Max. Marks : 40

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

4

1. Find the reduced form of the ratio of the first quantity to second quantity. 14 ₹, 12 ₹ and 40 paise.
2. For class interval 20-25 write the lower class limit and the upper class limit:
3. For an individual (age 45 years) having annual taxable income of ₹ 3,50,000 how much percent of income tax is applicable?
4. Convert the following ratio into percentage.  
47 : 50
5. Find the class-mark of the class 35-40.
6. 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.	Mrs. Kulkarni	36	₹ 3,27,000	
2.	Miss. Mehta	44	₹ 5,82,000	

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

4

1. Compare the following pairs of ratios:  
 $\frac{5}{8}$  and  $\frac{17}{121}$
2. Find the median of the observations, 59, 75, 68, 70, 74, 75, 80.
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. For a given A.P.,  $a = 3.5$ ,  $d = 0$ ,  $n = 101$  then  $t_n = \dots$  .  
 (A) 0 (B) 3.5  
 (C) 103.5 (D) 104.5
2. GST system was introduced in our country from .....  
 (A) 31st March 2017  
 (B) 1st April 2017  
 (C) 1st January 2017  
 (D) 1st July 2017
3. The formula to find mean from a grouped frequency table is  $\bar{x} = A + g \frac{\sum f_i u_i}{\sum f_i}$  h In the formula  $u_i = \dots$  .  
 (A)  $\frac{x_i + A}{g}$  (B)  $(x_i - A)$   
 (C)  $\frac{x_i - A}{g}$  (D)  $\frac{A - x_i}{g}$
4. Different expenditures incurred on the construction of a building were shown by a pie diagram. The expenditure Rs. 45,000 on cement was shown by a sector of central angle of  $75^\circ$ . What was the total expenditure of the construction ?  
 (A) 2,16,000 (B) 3,60,000  
 (C) 4,50,000 (D) 7,50,000

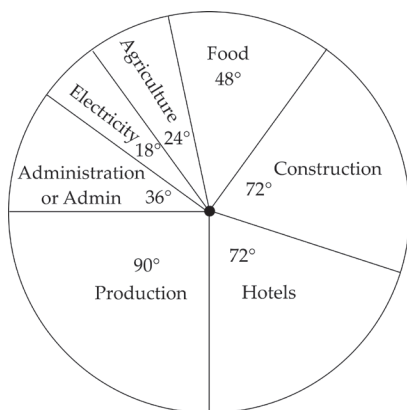
**Q.2. (B) Solve the following : (Any 2)**

**4**

1. Decide whether following sequence is an A.P., if so find 20th term of the progression.  
 $-12, -5, 2, 9, 16, 23, 30, \dots$
2. The taxable value of Wrist watch belt is ₹ 586. Rate of GST is 18%, then what is price of the belt for the customer?

... 3 ...

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. The following table shows the number of students and the time they utilized daily for their studies. Find the mean time spent by students for their studies by direct method.

Time (hrs.)	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10
No. of students	7	18	12	10	3

Solution:

Time (in hrs.)	Class Mark ( $x_i$ )	No. of students ( $f_i$ )	$f_i x_i$
0 - 2	1	7	7
2 - 4	<input type="text"/>	18	<input type="text"/>
4 - 6	5	12	60
6 - 8	<input type="text"/>	10	<input type="text"/>
8 - 10	9	3	27
<b>Total</b>		$N = \sum f_i = 50$	$\sum f_i x_i = \text{$

$$\text{Mean } (\bar{x}) = \frac{\sum f_i x_i}{\sum f_i}$$

... 4 ...

$$= \frac{\square}{50}$$
$$= \square$$

∴ **Mean of the time spent by students for studies is  $\square$  hrs.**

2. Complete the following table by writing suitable numbers and words.

Sr. No.	Face Value	Share is at	Market Value
(i)	₹ 100	par	
(ii)		Premium ₹ 500	₹ 575
(iii)	₹ 10		₹ 5

3. First term and common difference of an A.P. are 6 and 3 respectively:

Find  $S_{27}$

**Solution:**

$$a = 6, d = 3, S_{27} = ?$$

$$S_n = \frac{n}{2} [ \square + (n-1)d ]$$

$$\therefore S_{27} = \frac{27}{2} [ 12 + (27-1)\square ]$$

$$= \frac{27}{2} \times \square$$

$$= 27 \times 45$$

$$\therefore S_{27} = \square$$

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

**4**

- Find the 27th term of the following A.P.  
9, 4, -1, -6, -11, ...
- Market value of a share is ₹ 200. If the brokerage rate is 0.3% then find the purchase value of the share.
- Draw a histogram of the following data.

<b>Height of student (cm)</b>	135 - 140	140 - 145	145 - 150	150 - 155
<b>No. of students</b>	4	12	16	8

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

9

1. Electricity used by some families is shown in the following table. Find the mode for use of electricity.

<b>Use of electricity (Unit)</b>	0-20	20-40	40-60	60-80	80-100	100-120
<b>No. of families</b>	13	50	70	100	80	17

2. Find how many three digit natural numbers are divisible by 5.
3. A dealer supplied Walky-Talky set of ₹ 84,000 (with GST) to police control room. Rate of GST is 12%. Find the amount of state and central GST charged by the dealer. Also find the taxable value of the set.
4. A frequency distribution table for the production of oranges of some farm owners is given below. Find the mean production of oranges by 'assumed mean' method.

<b>Production (Thousand ₹)</b>	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
<b>No. of farm owners</b>	20	25	15	10	10

**Q.5 Solve the following : (Any 1)**

4

1. Sachin invested in a National Saving Certificate scheme. In the 1st year, he invested ₹ 5000, in 2nd year ₹ 7000, in 3rd year ₹ 9000 and so on. Find the total amount that he invested in 12 years.
2. The following table shows the classification of percentages of marks of students and the number of students. Draw a frequency polygon from the table.

<b>Result (Percentage)</b>	30-40	40-50	50-60	60-70	70-80	80-90	90-100
<b>No. of students</b>	7	33	45	65	47	18	5

**Q.6 Solve the following : (Any 1)**

**3**

1. The following table shows classification of number of workers and the number of hours they work in a software company. Find the median of the number of hours they work.

<b>Daily No. of hours</b>	8 - 10	10 - 12	12 - 14	14 - 16
<b>No. of workers</b>	150	500	300	50

2. In an A.P. 10<sup>th</sup> term is 46, sum of 5<sup>th</sup> and 7<sup>th</sup> term is 52. Find the A.P.

*Best of Luck* 🍀