

MT

2018 ____ 1100

Seat No.

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

Time : 2 Hours

(Pages 6)

Max. Marks : 40

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

4

1. Check whether the following numbers are in continued proportion.
2, 4, 8.
2. Find the mode of the following data.

Marks	35	36	37	38	39	40
No. of students	09	07	09	04	04	02

3. 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	

4. For an individual (age 55 years), if annual income is ₹ 5,50,000 and deduction under section 80C is ₹ 1,80,000. Then amount of taxable income will be ?
5. For class interval 20-25 write the lower class limit and the upper class limit:
6. Which individuals are considered as super senior citizens?

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

4

1. Compare the following pairs of ratios: $\frac{\sqrt{5}}{3}$, $\frac{3}{\sqrt{7}}$
2. Find the median of the observations, 59, 75, 68, 70, 74, 75, 80.

... 2 ...

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. What is the sum of first 30 natural numbers?
(A) 464 (B) 465
(C) 462 (D) 461
2. The rate of GST on stainless steel utensils is 18%, then the rate of State GST is
(A) 18% (B) 9%
(C) 36% (D) 0.9%
3. 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° . What was the total expenditure of the construction ?
(A) 2,16,000 (B) 3,60,000
(C) 4,50,000 (D) 7,50,000
4. Rate of GST on essential commodities is
(A) 5% (B) 12%
(C) 0% (D) 18%

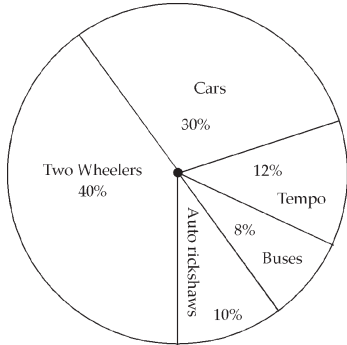
Q.2. (B) Solve the following : (Any 2)

4

1. Find the 19th term of the following A.P.
7, 13, 19, 25, ...
2. Find the amount received when 300 shares of FV ₹ 100, were sold at a discount of ₹ 30

... 3 ...

3. Observe the below pie diagram. It shows the percentages of number of vehicles passing a signal in a town between 8 am and 10 am



- (i) Find the central angle for each type of vehicle.
 (ii) If the number of two-wheelers is 1200, find the number of all vehicles.

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

4

1. The following table shows the income of farmers in a grape season. Find the mean of their income.

Income (Thousand ₹)	20-30	30-40	40-50	50-60	60-70	70-80
Farmers	10	11	15	16	18	14

Solution:

Production (in thousand rupees)	Class Mark (x_i)	No. of families (f_i)	$f_i x_i$
20 - 30	25	10	250
30 - 40	<input type="text"/>	11	385
40 - 50	45	15	<input type="text"/>
50 - 60	<input type="text"/>	16	880
60 - 70	65	18	<input type="text"/>
70 - 80	<input type="text"/>	14	1050
Total		$N = \sum f_i = 84$	$\sum f_i x_i =$ <input type="text"/>

$$\begin{aligned} \text{Mean } (\bar{x}) &= \frac{\sum f_i x_i}{\sum f_i} \\ &= \frac{\quad}{84} \\ &= 52.5 \end{aligned}$$

... 4 ...

$$\begin{aligned}\text{Mean of production} &= 52.5 \times 1000 \\ &= 52,500\end{aligned}$$

∴ **Mean of production in rupees is ₹ 52,500.**

2. Fill in the blanks given in the contract note of sale-purchase of shares.
(B - buy S - sell)

No. of shares	MV of shares	Total value	Brokerage 0.2%	9% CGST on brokerage	9% SGST on brokerage	Total Value of shares
100 B	₹ 45					
75 S	₹ 200					

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 sum of first 123 even natural numbers.
- A share is sold for the market value of ₹ 1000. Brokerage is paid at the rate of 0.1%. What is the amount received after the sale ?
- Time allotted for the preparation of an examination by some students is shown in the table. Draw a histogram to show the information.

Time (minutes)	60 - 80	80 - 100	100 - 120	120 - 140	140 - 160
No. of students	14	20	24	22	16

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

9

1. Grouped frequency distribution of supply of milk to hotels and the number of hotels is given in the following table. Find the mode of the supply of milk.

Milk (litre)	1-3	3-5	5-7	7-9	9-11	11-13
No. of hotels	7	5	15	20	35	18

2. Two A.P.'s are given 9, 7, 5... and 24, 21, 18, ...If n^{th} term of both the progressions are equal then find the value of n and n^{th} term
3. A ready-made garment shopkeeper gives 5% discount on the dress of ₹ 1000 and charges 5% GST on the remaining amount, then what is the purchase price of the dress for the customer?
4. The 11th term and the 21st term of an A.P. are 16 and 29 respectively, then find the 41st term of that A.P.

Q.5 Solve the following : (Any 1)

4

1. A wholesaler purchased electric goods for the taxable amount of ₹ 1,50,000. He sold it to the retailer for the taxable amount of ₹ 1,80,000. Retailer sold it to the customer for the taxable amount of ₹ 2,20,000. Rate of GST is 18%. Show the computation of GST in tax invoices of sales. Also find the payable CGST and payable SGST for wholesaler and retailer.
2. Draw a frequency polygon for the following grouped frequency distribution table.

Age of the donor (Yrs.)	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49
No. of blood donors	38	46	35	24	15	12

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.

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

2. Mr. Amol purchased 50 shares of Face Value ₹ 100 when the Market value of the share was ₹ 80. Company had given 20% dividend. Find the rate of return on investment.

Best of Luck 🍀