

VIVEK TUTORIALS

Preliminary Examination

Std: SSC (E.M) Date : 04/Feb/2020

Subject: Mathematics I

Time: 2 Hours Max Marks: 40

- (i) All questions are compulsory.
- (ii) Use of calculator is not allowed.
- (iii) Total marks are shown on the right side of the question.

Q.1(A) Choose the correct alternative:

- (1) Find discriminate of following quadratic equation $6x^2 + x 2 = 0$ (a) -47 (b) 47 (c) 49 (d) -48
- (2) The probability of a 2 digit number less than 60 and divisible by 5 is
 (a) 10/49
 (b) 1/5
 (c) 1/6
 (d) 9/50
- (3) To find the cost of one share at the time of buying the amount of Brokerage and GST is to be . . . the MV of share .
 - (A) added to
 - (B) subtracted from
 - (C) Multiplied with
 - (D) divided by
- (4)

In the formula for calculating mode, $Mo = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_0}\right) \times h$

(a) f_0 , f_1 and f_2 are the frequencies of any three consecutive class intervals

- (b) f_0 is the frequency of class preceding the modal class
- (c) f_1 is the frequency of class succeeding modal class
- (d) f_2 is the frequency of modal class

(B) Solve the following:

- (1) How many possibilities are there in each of the following: One number from 10 to 20 is written on each card. Select one card randomly.
- (2) Complete the following table by writing suitable numbers and words.

Sr. no.	FV	Share is at	MV
(1)	Rs. 100	Par	
(2)		Premium Rs. 500	Rs. 575
(3)	Rs. 10	<u>6/16/26/26/</u> %	Rs . 5

(3). Find the frequency for the class interval 11.5-13.5.



(4) On certain article if rate of CGST is 9% then what is the rate of SGST? and what is the rate of GST?

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Q.2(A) Complete the following activities:(Any TWO)

(1) Which of the following sequences are A.P? If it is an A.P, find next two terms: 1, 1, 2, 2, 3, 3, ...

In the sequence 1, 1, 2, 2, 3, 3, ...,

$$t_1 = 1, t_2 = 1, t_3 = \Box t_4 = 2, t_5 = 3, t_6 = 3...$$

 $t_2 - t_1 = 1 - 1 = 0, t_3 - t_2 = 2 - 1 = \Box$
 $t_4 - t_3 = 2 - 2 = 0, t_3 - t_2 \Box t_2 - t_1$

In this sequence difference between two consecutive terms is not constant.

- .: This sequence an A.P.
- (2) Two numbers differ by 3. The sum of twice the smaller number and thrice the greater number is 19. Find the numbers.

Assume that the greater number be 'x' and smaller number be 'y'

From condition (I): Two numbers differ by 3

 $x - y = 3 \dots (I)$ From condition (II): The sum of twice the smaller number and thrice the greater number is 19

$$2y + 3x = 19$$

 $3x + 2y = 19 \dots$ (II) Solving (I) and (II) using Cramer's rule as



Therefore, the numbers are 5 and 2.

(3) Two coins are tossed simultaneously. Write the sample space (S) and number of sample points n(S).

Also write the following events in the set form and write the number of sample points in each event.

(i) Condition for event A : to get at least one tail.

- (ii) Condition for event B : to get only one head.
- (iii) Condition for event C: to get at most one tail.
- (iv) Condition for event D : to get no head.

If two coins are tossed simultaneously,

$$S = \{HH, HT, TH, TT\}$$
 $n(S) =$

(i) Condition for event A : at least one head.

 $A = \{HH, HT, TH\}$ n(A) =

(ii) Condition for event B : only one head.

 $B = \{HT, TH\}$ n(B) = 2

(iii) Condition for event C : at most one tail.

 $C = \{HH, TH\}$ n(C) =

(iv) Condition for event D : No head.

 $D = \{TT\}$ n(D) = 1

(B) Solve the following: (Any FOUR)

- (1) Solve the following quadratic equation by factorisation: $25m^2 = 9$
- (2) Joseph kept 26 cards in a cap, bearing one English alphabet on each card. One card is drawn at random. What is the probability that the card drawn is a vowel card ?
- (3) The taxable value of a wrist watch belt is Rs.586. Rate of GST is 18%. Then what is price of the belt for the customer ?
- (4) Find the mode for the following data.

Distance (in $ m km$)	Number of people	
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2-10	3
10 - 18	8
18-26	5
26-34	4
34-42	5

(5) Write the following equation in the form $ax^2 + bx + c = 0$, then write the values of a, b, c for each equation:

 $\mathbf{x^2} + 5\mathbf{x} = -(3 - \mathbf{x})$

Q.3(A) Complete the following activity:(Any ONE)

(1) Solve the following simultaneous equation using Cramer's rule. 4x + 3y - 4 = 0; 6x = 8 - 5y







(2) In a bicycle shop, number of bicycles purchased and choice of their colours was as follows. Find the measures of sectors of a circle to show the information by a pie diagram.

In all 36 bicycles were

purchased. Out of them 10 bicycles were white coloured.

... the measure of sector showing white coloured bicycles

$$= \frac{\text{Number of white bicycles}}{\text{Total number of bicycles}} \times 360$$

$$=\frac{10}{36} \times 360 =$$

The measures of angles of sector relating to bicycles of other colours can be calculated similarly which are shown in the adjacent table.

(B) Solve the following: (Any TWO)

- Colour Number of Central angle of bicycles the sector White 10 × 360 = 36 Black 9 × 360 36 Blue 6 60° Grey 7 40° Red 4 Total
- (1) Prepare Business to Business (B2B) Tax Invoice as per the details given below. name of the supplier, address, Date etc. as per your choice.

Supplier - Name, Address, State, GSTIN, Invoice No., Date

Recipient - Name, Address, State, GSTIN,

Items : (1) Pencil boxes 100, HSN - 3924, Rate - Rs.20, GST 12%

(2) Jigsaw Puzzles 50, HSN 9503, Rate - Rs.100 GST 12%.

(2) The roots of each of the following quadratic equations are real and equal, find k.

 $(1) \ 3y^2 + ky + 12 = 0$

- (2) kx (x 2) + 6 = 0
- (3) In an A.P. 19th term is 52 and 38th term is 128, find sum of first 56 terms.
- (4) Answer the following questions based on the frequency polygon given in the below figure.

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- (1) Write frequency of the class 50-60. (2) State the class whose frequency is 14.
- (3) State the class whose class mark is 55.
- (4) Write the class in which the frequency is maximum.
- (5) Write the classes whose frequencies are zero.

0.4 Solve the following: (Any TWO)

- (1) Form the quadratic equation whose roots are the squares of the sum of roots and square of the difference of roots of the equation $2x^2 + 2(m+n)x + m^2 + n^2 = 0$
- (2) Two water taps together can fill a tank in 9 3/8 Hours. The larger tap takes 10 hours les than the smaller one to fill the tank separately. Find the time in which each tap can be separately fill the tank.
- (3) A bag contains 5 white balls, 7 red balls, 4 black balls and 2 blue balls. One ball is drawn at random from the bag. What is the probability that the ball drawn is:
 - (i) white or blue
 - (ii) red or black
 - (iii) not white
 - (iv) neither white nor black?

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

- (1) The forewheel of a carriage makes 6 revolutions more than the rear wheel in going 120 m. If the diameter of the forewheel be increased by 1/4 its present diameter and the diameter of the rear wheel be increased by one-fifth of its present diameter, then the fore wheel makes 4 revolutions more than the rear wheel in going the same distance(120m). Find the circumference of each wheel of the carriage.
- (2) Babubhai borrow Rs 4000 and agrees to repay with a total interest of Rs 500 in 10 instalments, each instalment being less than the preceding instalment by Rs. 10. What should be the first and the last instalment?

----- All the Best ------

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