Class-10

B2E Learning

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Mock Test -1

Secondary Examination, 2023

Mathematics

Section A

1. Find the greatest number of three digits which when divided by 34 leaves remainder as 2.

   (a) 992 (b) 988 (c) 994

   (d) 954 (e) None of these

2. Find the value of p so that the quadratic equation $px(x - 3) + 9 = 0$ has two equal roots.

   (a) 2 (b) 3 (c) 4 (d) none of these

3. α and β are zeroes of the quadratic polynomial $x^2 - 6x + y$. Find the value of 'y' if $3\alpha + 2\beta = 20$.

   (a) 12 (b) -23 (c) -16 (d) none of these

4. How many solutions does the pair of equations y = 0 and y = -5 have?

   (a) 0 (b) 1 (c) Many Solution (d) None of these

5. Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5).

   (a) X-Y =2 (b) X+Y=2 (b) Both A and B (d) None of These

6. If $\Delta ABC \sim \Delta PQR$, perimeter of ΔABC = 32 cm, perimeter of ΔPQR = 48 cm and PR = 6 cm, then find the length of AC.

   (a) 2 (b) 3 (c) 4 (d) None of These

7. Evaluate $2\tan^2 45° + \cos^2 30° - \sin^2 60°$.

   (a) 3 (b) 5 (c) 4 (d) None Of these

8. If $\tan\theta + \cot\theta = 5$, find the value of $\tan^2\theta + \cot^2\theta$

   (a) 22 (b) 23 (c) 24 (d) 25

9. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower

(a) 40 (b) 42 (c) 44 (d) 48

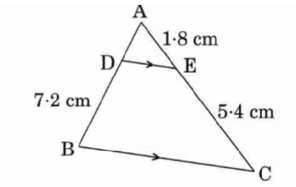
10. In the figure, DE || BC. Find the length of side AD, given that AE = 1.8 cm, BD = 7.2 cm and CE = 5.4 cm.

(a) 2.8

(b) 2.4

(c) 2.6

(d) 2.2



11. From A Point Q The Length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. Find the radius of the circle

(a) 5 (b) 7 (c) 12 (d) 17

12. The circumference of a circle is 22 cm. Calculate the area of its quadrant (in cm^2)

(a) 77/8 (b) 77/4 (c) 77/2 (d) 77

13. A cone has a height of 12 cm and a base radius of 3.5 cm, how much ice cream can be put into the cone?

(a) 77 (b) 154 (c) 77/2 (d) 145

14. If the difference of Mode and Median of a data is 24, then the difference of median and mean is

(a) 8 (b) 12 (c) 24 (d) 36

15. For the following distribution,

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

the sum of the lower limits of the median and modal class is

(a) 15 (b) 25 (c) 30 (d) 35

16. Two dice are rolled simultaneously. What is the probability that 6 will come up at least once?

(a)1/6 (b) 7/36 (c) 11/36 (d) 13/36

17. If sec θ + tan θ = 7, then evaluate sec θ – tan θ=?

(a) 1/3 (b) 1/5 (c) 1/7 (d)1/9

18. If the area of a circle is equal to sum of the areas of two circles of diameters 10 cm and 24 cm, calculate the diameter of the larger circle (in cm)

(a) 13 (b) 26 (c) 39 (d) 52

19. Statement A (Assertion): If product of two numbers is 5780 and their HCF is 17, then their LCM is 340
Statement R (Reason) : HCF is always a factor of LCM

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

20. Statement A (Assertion): If the co-ordinates of the mid-points of the sides AB and AC of ΔABC are D(3,5) and E(-3,-3) respectively, then BC = 20 units

Statement R (Reason): The line joining the mid points of two sides of a triangle is parallel to the third side and equal to half of it.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason(R) is false.

(d) Assertion (A) is false but reason(R) is true.

Section-B

21. The larger of two supplementary angles exceeds thrice the smaller by 20 degrees. Find them.

22. A foot of a 10 m long ladder leaning against a vertical wall is 6 m away from the base of the wall. Find the height of the point on the wall where the top of the ladder reaches

23. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

24. If the difference between the circumference and the radius of a circle is 37 cm, then using $\pi = 227$, calculate the circumference (in cm) of the circle

25. Find an acute angle θ when $\cos\theta - \sin\theta / \cos\theta + \sin\theta = 1 - \sqrt{3}/1 + \sqrt{3}$

Section C

26. If the HCF of 408 and 1032 is expressible in the form $1032p - 408 \times 5$ find p

27. If the zeroes of the polynomial $f(x) = x^3 - 12x^2 + 39x + a$ are in AP, find the value of a.

28. A diver rowing at the rate of 5 km/h in still water takes double the time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream.

OR

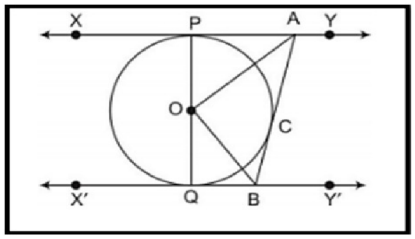
A boat covers 14 kms in upstream and 20 kms downstream in 7 hours. Also it covers 22 kms upstream and 34 kms downstream in 10 hours. Find the speed of the boat in still water and of that the stream.

29. If $\sec\theta + \tan\theta = p$, prove that $\sin\theta = p2-1/p2+1$

30. Prove that a parallelogram circumscribing a circle is a rhombus

OR

In the figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C interesting XY at A and X'Y' at B, what is the measure of $\angle AOB$.



31. Three unbiased coins are tossed together. Find the probability of getting:

(i) all heads. (ii) exactly two heads.

(iii) exactly one head. (iv) at least two heads.

(v) at least two tails

Section D

32. A man travels 300 km partly by train and partly by car. He takes 4 hours if the travels 60 km by train and the rest by car. If he travels 100 km by train and the remaining by car, he takes 10 minutes longer. Find the speeds of the train and the car separately

OR

$7x - 5y - 4 = 0$ is given. Write another linear equation, so that the lines represented by the pair are:

(i) intersecting

(ii) coincident

(iii) parallel

33. Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.

OR

Using the above theorem prove that a line through the point of intersection of the diagonals and parallel to the base of the trapezium divides the non parallel sides in the same ratio.

34. A room's has length, breadth, and height are 5m, 4m, and 3m respectively. Find the cost of whitewashing the walls of the room and the ceiling at the rate of 7.50 per m^2.

OR

A metallic circular cylinder is 15 cm in height and the diameter of the base is 14 cm. It is melted and recast into another cylinder with a radius of 14 cm. Find the height and curved surface area of the new cylinder formed after the recasting.

35. The mean of the following frequency distribution is 62.8 and the sum of frequencies is 50. Find the missing frequencies f_1 and f_2: (2013)

Classes	*Frequencies*
0–20	5
20-40	f_1
40-60	10
60-80	f_2
80-100	7
100–120	8

OR

Draw: (a) more than ogive and (2017OD)

(b) less than ogive for the following data. Also find its median.

Class	*Frequency*
0–10	8
10–20	7
20–30	5
30–40	10
40–50	5

Section-E

Case study based questions are compulsory.

36. As the demand for the products grew, a manufacturing company decided to hire more employees. For which they want to know the mean time required to complete the work for a worker. The following table shows the frequency distribution of the time required for each worker to complete a work.

Time (in hours)	15-19	20-24	25-29	30-34	35-39
Number of workers	10	15	12	8	5

Based on the above information, answer the following questions.

(i) The class mark of the class 25-29 is

(a) 17 (b) 22 (c) 27 (d) 33

(ii) If x_i's denotes the class marks and f_i's denotes the corresponding frequencies for the given data, then the value of $\sum x_i f_i$ equals to

(a) 1200 (b) 1205 (c) 1260 (d) 1265

(iii) The mean time required to complete the work for a worker is

(a) 22 hrs (b) 23 hrs (c) 24 hrs (d) none of these

(iv) If a worker works for 8 hrs in a day, then approximate time required to complete the work for a worker is

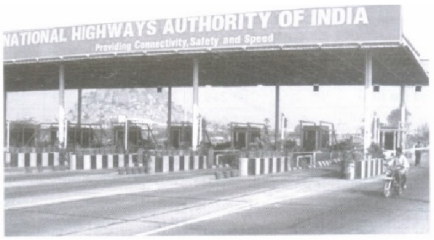
(a) 3 days (b) 4 days (c) 5 days (d) 6 days

(v) The measure of central tendency is

(a) Mean (b) Median (c) Mode (d) All of these

OR

On a particular day, National Highway Authority of India (NHAI) checked the toll tax collection of a particular toll plaza in Rajasthan.



The following table shows the toll tax paid by drivers and the number of vehicles on that particular day.

Toll tax (in Rs)	30-40	40-50	50-60	60-70	70-80
Number of vehicles	80	110	120	70	40

Based on the above information, answer the following questions.

(i) If A is taken as assumed mean, then the possible value of A is

(a) 32 (b) 42 (c) 85 (d) 55

(ii) If x_i's denotes the class marks and f_i's denotes the deviation of assumed mean (A) from x_i's, then the minimum value of $|d_i|$ is

(a) -200 (b) -100 (c) 0 (d) 100

(iii) The mean of toll tax received. by NHAI by assumed mean method is

(a) Rs 52 (b) Rs 52.14 (c) Rs 52.50 (d) Rs 53.50

(iv) The mean of toll tax received by NHAI by direct method is

(a) equal to the mean of toll tax received by NHAI by assumed mean method

(b) greater than the mean of toll tax received by NHAI by assumed mean method

(c) less than the mean of toll tax received by NHAI by assumed mean method

(d) none of these

(v) The average toll tax received by NHAI in a day, from that particular toll plaza, is

(a) Rs 21000 (b) Rs 21900 (c) Rs 30000 (d) none of these

37. Transport department of a city wants to buy some Electric buses for the city. For which they wants to analyse the distance travelled by existing public transport buses in a day.

The following data shows the distance travelled by 60 existing public transport buses in a day.

Daily distance travelled (in km)	200-209	210-219	220-229	230-239	240-249
Number of buses	4	14	26	10	6

Based on the above information, answer the following questions.

(i) The upper limit of a class and lower limit of its succeeding class is differ by

(a) 9 (b) 1 (c) 10 (d) none of these

(ii) The median class is

(a) 229.5-239.5 (b) 230-239 (c) 220-229 (d) 219.5-229.5

(iii) The cumulative frequency of the class preceding the median class is

(a) 14 (b) 18 (c) 26 (d) 10

(iv) The median of the distance travelled is

(a) 222 km (b) 225 km (c) 223 km (d) none of these

(v) If the mode of the distance travelled is 223.78 km, then mean of the distance travelled by the bus is

(a) 225 km (b) 220 km (c) 230.29 km (d) 224.29 km

OR

A group of 71 people visited to a museum on a certain day. The following table shows their ages.

Age (in years)	Number of persons
Less than 10	3
Less than 20	10
Less than 30	22
Less than 40	40
Less than 50	54
Less than 60	71

Based on the above information, answer the following questions.

(i) If true class limits have been decided by making the classes of interval 10, then first class must be

(a) 5-15 (b) 0-10 (c) 10-20 (d) none of these

(ii) The median class for the given data will be

(a) 20-30 (b) 10-20 (c) 30-40 (d) 40-50

(iii) The cumulative frequency of class preceding the median class is

(a) 22 (b) 13 (c) 25 (d) 35

(iv) The median age of the persons visited the museum is

(a) 30 years (b) 32.5 years (c) 34 years (d) 37.5 years

(v) If the price of a ticket for the age group 30-40 is Rs 30, then the total amount spent by this age group is

(a) Rs 360 (b) Rs 420 (c) Rs 540 (d) Rs 340