Sample Paper 14

Class - 10th Exam - 2026 - 27

Mathematics - Basic

Time : 3 Hours **Max. Marks : 80**

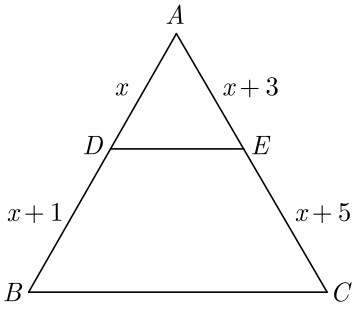
General Instructions :

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. In $\Delta ABC, DE || BC$, find the value of x.



(a) 3 (b) 2

(c) 4 (d) 1

2. If the radius of a circle is diminished by 10%, then its area is diminished by

(a) 10% (b) 19%

(c) 36% (d) 20%

3. If the mean of the observation $x, x+3, x+5, x+7$ and $x+10$ is 9, the mean of the last three observation is

(a) $10\frac{1}{3}$ (b) $10\frac{2}{3}$

(c) $11\frac{1}{3}$ (d) $11\frac{2}{3}$

4. If the lines given by $3x+2ky=2$ and $2x+5y+1=0$ are parallel, then the value of k is

(a) $-\frac{5}{4}$ (b) $\frac{2}{5}$

(c) $\frac{15}{4}$ (d) $\frac{3}{2}$

5. The following data gives the distribution of total household expenditure (in $<$) of manual workers in a city.

Expenditure (in $<$)	**Frequency**
1000-1500	24
1500-2000	40
2000-2500	33
2500-3000	28
3000-3500	30
3500-4000	22
4000-4500	16
4500-5000	07

Then, find the average expenditure which is done by the maximum number of manual workers.

(a) 1747.26 (b) 1847.26

(c) 1947.26 (d) 2047.26

6. The quadratic equation $2x^2-3\sqrt{2}\,x+\frac{9}{4}=0$ has

(a) two distinct real roots (b) two equal real roots

(c) no real roots (d) more than 2 real roots

7. The quadratic equation $3x^2+4\sqrt{3}\,x+4$ has

(a) two distinct real roots (b) two equal real roots

(c) no real roots (d) more than 2 real roots

8. AB and CD are two common tangents to circles which touch each other at a point C. If D lies on AB such that $CD=4$ cm then AB is

(a) 12 cm (b) 8 cm

(c) 4 cm (d) 6 cm

9. If two solid hemispheres of same base radius r are joined together along their bases, then curved surface area of this new solid is

(a) $4\pi r^2$ (b) $6\pi r^2$

(c) $3\pi r^2$ (d) $8\pi r^2$

10. A letter is chosen at random from the letters of the word ASSASSINATION, then the probability that the letter chosen is a vowel is in the form of $\frac{6}{2x+1}$, then x is equal to

(a) 5 (b) 6

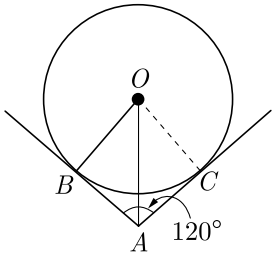
(c) 7 (d) 8

11. Two dice are thrown together. The probability that sum of the two numbers will be a multiple of 4, is:

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{8}$ (d) $\frac{1}{4}$

12. In the given figure, two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^\circ$, then OA is equal to that



(a) $2AB$ (b) $3AB$

(c) $4AB$ (d) $5AB$

13. Given that $\sin\alpha = \frac{\sqrt{3}}{2}$ and $\cos\beta = 0$, then the value of $\beta - \alpha$ is

(a) 0° (b) 90°

(c) 60° (d) 30°

14. If $\sec 5A = \text{cosec}(A + 30^\circ)$, where $5A$ is an acute angle, then the value of A is

(a) 15° (b) 5°

(c) 20° (d) 10°

15. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1$ is -3, then the value of k is

(a) $\frac{4}{3}$ (b) $\frac{-4}{3}$

(c) $\frac{2}{3}$ (d) $-\frac{2}{3}$

16. Two poles of height 6 m and 11 m stand vertically upright on a plane ground. If the distance between their foot is 12 m, then distance between their tops is

(a) 12 m (b) 14 m

(c) 13 m (d) 11 m

17. A 6 m high tree cast a 4 m long shadow. At the same time, a flag pole cast a shadow 50 m long. How long is the flag pole?

(a) 75 m (b) 100 m

(c) 150 m (d) 50 m

18. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$ then the angle of elevation of the sun is

(a) 90° (b) 45°

(c) 30° (d) 75°

19. **Assertion :** The two tangents are drawn to a circle from an external point, then they subtend equal angles at the centre.
Reason : A parallelogram circumscribing a circle is a rhombus.

(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 but 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. **Assertion :** If n^{th} term of an AP is $7 - 4n$, then its common differences is -4.
Reason : Common difference of an AP is given by $d = a_{n+1} - a_n$.

(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 but 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

Section B consists of 5 questions of 2 marks each.

21. The mid-point of the line-segment AB is $P(0, 4)$, if the coordinates of B are $(-2, 3)$ then find the co-ordinates of A.

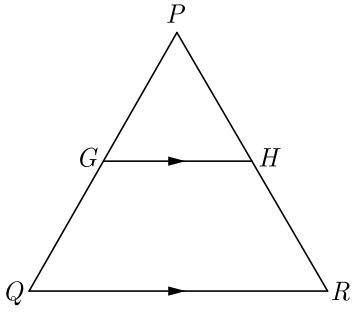
22. Two different dice are tossed together. Find the probability :

(i) that the number on each die is even.

(ii) that the sum of numbers appearing on the two dice is 5.

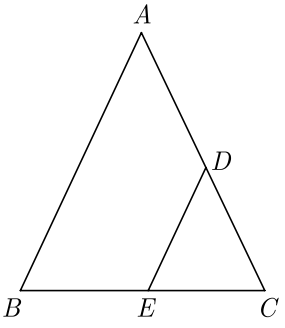
23. Given that HCF (306, 1314) = 18. Find LCM (306, 1314)

24. In the given figure, G is the mid-point of the side PQ of ΔPQR and $GH \,||\, QR$. Prove that H is the mid-point of the side PR or the triangle PQR.



OR

In the figure of ΔABC, the points D and E are on the sides CA, CB respectively such that $DE \| AB$, $AD = 2x, DC = x+3, BE = 2x-1$ and $CE = x$. Then, find x.



25. If α and β are the zeroes of a polynomial $x^2 - 4\sqrt{3}\,x + 3$, then find the value of $\alpha + \beta - \alpha\beta$.

OR

If one of the zeroes of the quadratic polynomial $f(x) = 14x^2 - 42k^2x - 9$ is negative of the other, find the value of 'k'.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. Evaluate :

$$\frac{3\tan^2 30^\circ + \tan^2 60^\circ + \operatorname{cosec} 30^\circ - \tan 45^\circ}{\cot^2 45^\circ}$$

Ans : [Board Term-1 2016]

$$\frac{3\tan^2 30^\circ + \tan^2 60^\circ + \operatorname{cosec} 30^\circ - \tan 45^\circ}{\cot^2 45^\circ}$$

$$= \frac{3\times\left(\frac{1}{\sqrt{3}}\right)^2 + \left(\sqrt{3}\right)^2 + 2 - 1}{(1)^2}$$

$$= \frac{3\times\frac{1}{3} + 3 + 2 - 1}{1}$$

$$= 1 + 3 + 2 - 1 = 5$$

27. Prove that the rectangle circumscribing a circle is a square.

28. A solid is in the shape of a cone surmounted on a hemisphere. The radius of each of them being 3.5 cm and the total height of the solid is 9.5 cm. Find the volume of the solid.

OR

A heap of rice is in the form of a cone of base diameter 24 m and height 3.5 m. Find the volume of the rice. How much canvas cloth is required to just cover the heap?

29. Write the smallest number which is divisible by both 306 and 657.

30. The mean of the following distribution is 48 and sum of all the frequency is 50. Find the missing frequencies x and y.

Class	20-30	30-40	40-50	50-60	60-70
Frequency	8	6	x	11	y

OR

The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure on food.

Daily expenditure (in ₹)	100-150	150-200	200-250	250-300	300-350
Number of households	4	5	12	2	2

31. ΔABC and ΔBDE are two equilateral triangle such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is ..... .

SECTION - D

Section D consists of 4 questions of 5 marks each.

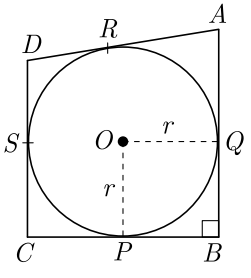
32. Prove that the point $(3,0)$, $(6,4)$ and $(-1,3)$ are the vertices of a right angled isosceles triangle.

33. Find the values of k for which the equation $(3k+1)x^2+2(k+1)x+1$ has equal roots. Also find the roots.

OR

A person on tour has ₹ 4200 for his expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by ₹ 70. Find the original duration of the tour.

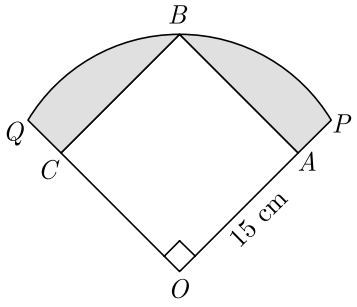
34. In figure, a circle with centre O is inscribed in a quadrilateral $ABCD$ such that, it touches the sides BC , AB, AD and CD at points P, Q, R and S respectively. If $AB = 29$ cm, $AD = 23$ cm, $\angle B = 90^\circ$ and $DS = 5$ cm, then find the radius of the circle (in cm).



OR

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

35. In Figure, a square $OABC$ is inscribed in a quadrant $OPBQ$. If $OA = 15\,\text{cm}$, find the area of the shaded region. (Use $\pi = 3.14$).

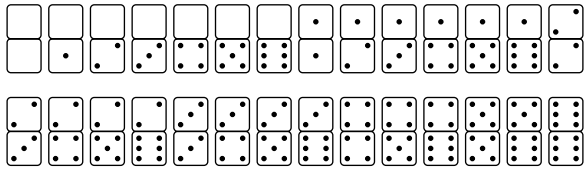


SECTION - E

Section E consists of 3 case study based questions of 4 marks each.

36. Double-six Dominos : It is a game played with the 28 numbered tiles shown in the diagram.





The 28 dominos are placed in a bag, shuffled, and then one domino is randomly drawn. Give the following answer.

(i) What is the probability the total number of dots on the domino is three or less ?

(ii) What is the probability the total number of dots on the domino is greater than three ?

(iii) What is the probability the total number of dots on the domino does not have a blank half ?

(iv) What is the probability the total number of dots on the domino is not a "double" (both sides the same) ?

37. Eiffel Tower : The Eiffel Tower is a landmark and an early example of wrought-iron construction on a gigantic scale. The lower section consists of four immense arched legs set on masonry piers. The legs curve inward until they unite in a single tapered tower. Platforms, each with an observation deck, are at three levels; on the first is also a restaurant.
The tower, constructed of about 7000 tons of iron, has stairs and elevators. A meteorological station, a radio communications station, and a television transmission antenna, as well as a suite of rooms that were used by Eiffel are located near the top of the tower.



(i) For a person standing 324 m from the center of the base of the Eiffel Tower, the angle of elevation to the top of the tower is 45°. How tall is the Eiffel Tower?

(ii) A car is moving at uniform speed towards the Eiffel tower. It takes 15 minutes for the angle of depression from the top of tower to the car to change from 30° to 60°. After how much time after this, the car will reach the base of the tower?

38. Bequests to Charity : At the time our mother left this Earth, she gave Rs 90000 to her children of birth. This we kept and each year added Rs 30000 more, as a lasting memorial from the children she bore. When Rs 4,20,000 is thusly attained, all goes to charity that her memory be maintained.

(i) What was the balance in the sixth year?

(ii) In what year was the goal of Rs 420,000 met?



****