

TIME : 3 Hr.

GENERAL INSTRUCTIONS:

- This Question Paper contains 38 questions .All Questions are compulsory.
- The Question Paper has 5 Sections A, B, C, D and E.
- In Section- A question number 1 to 18 are multiple choice Questions and question number 19 and 20 are Assertion-Reason based questions of 1 mark each .
- Section B has 5 Short Answer – I type questions carrying 2 marks each.
- Section C has 6 Short Answer – II type questions carrying 3 marks each.
- Section D has 4 Long Answer type questions carrying 5 marks each.
- Section E has 3 Case Based Integrated units of assessment (4 marks each) with sub-parts .
- There are no overall choice . However, an Internal choice has been provided in 2 Questions in Section B, 2 Questions in Section C , 2 Questions in Section D and 3 questions in Section E .
- Draw neat figures whenever required.

SECTION – A

- Q1. The value of the following pair of equation $x+3y=1$ and $3x-y=3$ is
 a) $x=5,y=1$ b) $x=2,y=3$ c) $x=1,y=2$ d) $x=1, y=0$
- Q2. A bag contain three green marbles, four blue marbles and two orange marbles. If a marbles is picked at random, then the probability that it is not an orange marbles is
 a) $\frac{7}{9}$ b) $\frac{2}{9}$ c) $\frac{4}{9}$ d) $\frac{5}{9}$
- Q3. If $\tan\theta=1$, then the value of $\frac{1}{\cos\theta} + \frac{1}{\sin\theta}$ is
 a) $3\sqrt{2}$ b) $4\sqrt{2}$ c) $2\sqrt{2}$ d) $5\sqrt{2}$
- Q4. The value of $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is equal to
 a) $\tan 90^\circ$ b) $\sin 45^\circ$ c) 0 d) 1
- Q5. Cards numbered 7 to 40 were put in the box. Meenu select a card at random. Probability of getting Meenu's card which is multiple of 7 is
 a) $\frac{7}{34}$ b) $\frac{6}{35}$ c) $\frac{5}{34}$ d) $\frac{6}{34}$

Q6. A pole 6m high casts a shadow $2\sqrt{3}$ m long on the ground, then sun's elevation is
a) 60° b) 45° c) 30° d) 90°

Q7. When a die is thrown, the probability of getting an even number less than 4 is

- a) $\frac{1}{4}$ b) 0 c) $\frac{1}{2}$ d) $\frac{1}{6}$

Q8. A ladder 18m long makes an angle of 60° with a wall. The height of the point where the ladder reaches the wall is

- a) $9\sqrt{3}$ m b) $18\sqrt{3}$ m c) 18m d) 9m

Q9. If the area of the circle is 154cm^2 , then its circumference is

- a) 11cm b) 22cm c) 44cm d) 35cm

Q10. Consider the following frequency distribution

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	3	9	15	30	18	5

The modal class is

- a) 0-10 b) 30-40 c) 50-60 d) 40-50

Q11. A card is selected from a deck of 52 cards. The probability of being a red face card is

- a) $\frac{3}{26}$ b) $\frac{3}{13}$ c) $\frac{2}{13}$ d) $\frac{1}{2}$

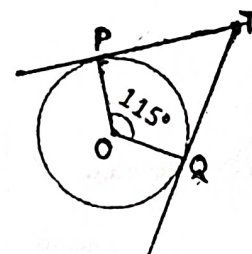
Q12. Two Cubes each of volume 64cm^3 are joined end to end, The surface area of the resulting cuboid is

- a) 149cm^2 b) 160cm^2 c) 135cm^2 d) 120cm^2

Q13. The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6 is

- a) x^2+5x+6 b) x^2-5x+6 c) x^2-5x-6 d) $-x^2+5x+6$

Q14. TP and TQ are tangents drawn to the circle with Centre O, If $\angle POQ=115^\circ$, then $\angle PTQ$ is



- a) 115° b) 57.5° c) 55° d) 65°

Q15. The value of a if $\text{HCF}(a,8)=4$ and $\text{LCM}(a,8)=24$ is

- a) 16 b) 8 c) 10 d) 14

- Q16. From a point Q, the length of tangent to a circle is 24cm and the distance of Q from the Centre is 25cm. The radius of the circle is
a) 7cm b) 15cm c) 12cm d) 24.5cm
- Q17. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle of 30° with the ground. The distance between the foot of the tree to the point where the top touches the ground is 8 m. The height of the tree is
a) $3\sqrt{8m}$ b) $4\sqrt{8m}$ c) $8\sqrt{3m}$ d) $4\sqrt{3m}$
- Q18. The mean and the median of a distribution is 8.32 and 8.05 respectively. The mode is
a) 8.25 b) 7.51 c) 7.35 d) 8.02

In the question number 19 and 20, a statement of assertion (A) is followed by a statement of reason (R).

Choose the correct option.

- a) Both assertion(A) and reason (R) are true and reason (R) is correct explanation of assertion (A).
b) Both assertion(A) and reason (R) are true but reason (R) is not 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.
- Q19. Assertion: The graph of the linear equations $3x+2y=12$ and $5x-2y=4$ gives a pair of intersecting lines.
Reason: The graph of linear equations $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ gives a pair of intersecting lines if $a_1/a_2 \neq b_1/b_2$
- Q20. Assertion (A): If a circle is divided into 5 sectors of equal areas , then the central angle of each sector is 72° .
Reason (R): The complete angle at the centre of a circle is 360° .

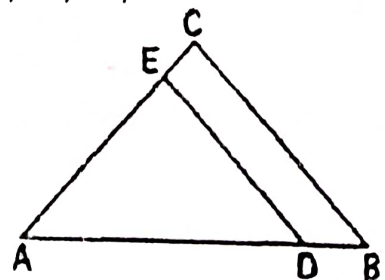
SECTION – B

- Q21. If the 17th term of an AP exceeds its 10th term by 7, Find the common difference.

OR

Check whether 301 is a term of the list of numbers 5, 11, 17, 23, ...

- Q22. In the given figure, $DE \parallel BC$, If $AD = x$, $DB = x-2$, $AE = x+2$ and $EC = x-1$. Then find AD .



- Q23. If the point A (0,2) is equidistant from the points B (3,p) and C (p,5), Find p. Also find the length of AB.

OR

Find the point on the x-axis which is equidistant from (2, -5) and (-2, 9).

- Q24. Find the area of a sector of a circle with radius 6 cm if angle of the sector is 60° .
Q25. Find the HCF of 72 and 120 by the prime factorization method. Also find their LCM.

SECTION -C

- Q26. Prove that the length of the tangent drawn from an external point to a circle are equal.
Q27. Prove that $5 - \sqrt{3}$ is irrational.
Q28. Quadratic polynomial $2x^2-3x+1$ has zeroes α and β . Now form a quadratic polynomial whose zeroes are 2α and 2β .
Q29. If $\cos A + \sin A = \sqrt{2} \cos A$. Show that $\cos A - \sin A = \sqrt{2} \sin A$

OR

Prove that
$$\frac{\sin \theta - 2\sin^3 \theta}{2\cos^3 \theta - \cos \theta} = \tan \theta$$

- Q30. Solve $2x+3y=11$ and $2x-4y=-24$ and hence find the value of 'm' for which $y=mx+3$.

OR

If $49x+51y=499$, $51x+49y=501$, then find the value of x and y.

- Q31. Prove that the parallelogram circumscribing a circle is a rhombus.

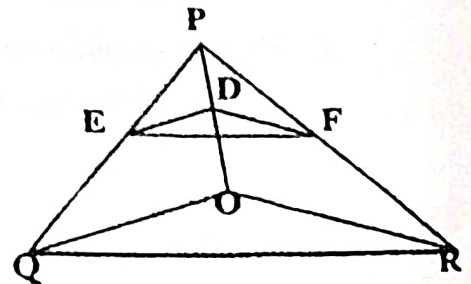
SECTION -D

- Q32. A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?

OR

Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. Find Rohan's present age.

- Q33. a) In given figure, $DE \parallel OQ$ and $DF \parallel OR$. Show that $EF \parallel QR$.



b) E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \sim \triangle CFB$.

Q34. Find the missing frequencies in the following frequency distribution table, if median is 32.

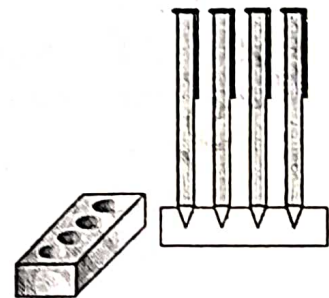
Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60	Total
No. of students	10	X	25	30	y	10	100

OR

Find Mean and Mode of the following data:

Class interval	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Frequency	4	8	10	12	10	4	2

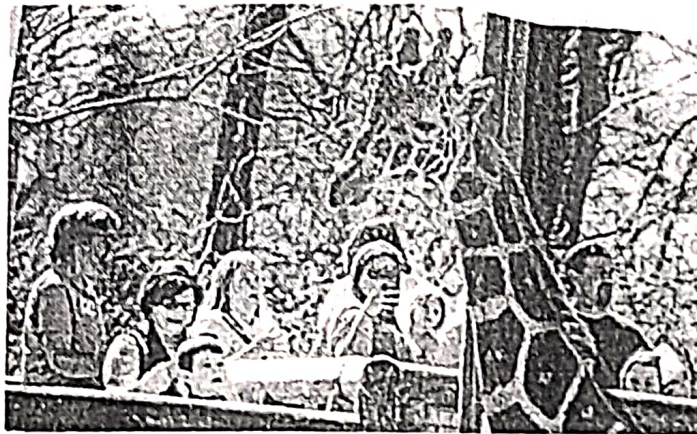
Q35. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand.



SECTION –E (Case based questions)

1+1+2

Q36. In November 2020, some new animals were added to a zoo. As a result the number of visitors to the zoo, increased daily by 10. A total of 6150 people visited zoo during the month of November which has 30 days .



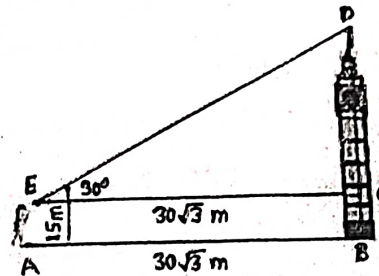
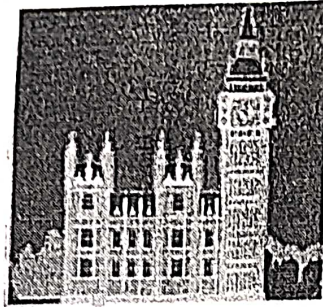
Based on the above information, answer the following.

- i) How many visitors visited the zoo on 1st November?
- ii) On which day of the month did 250 visitors visit the zoo?
- iii) How many persons visited the zoo in the last 5 days of the month of the November?

OR

- iii) How many collection (in rupees) from sale of tickets was done in the zoo on 15th November if each entry ticket cost Rs. 50?

Q.37 Clock towers are a specific type of building which house a turret clock and have one or more clock faces on the upper exterior walls. Many clock towers are freestanding structures but they can also adjoin or be located on the top of another building. Some other building also have clock faces on their exterior but these structures serve other main functions.



A 1.5m tall person is standing at a distance of $30\sqrt{3}$ m from the clock tower, observes the angle of elevation of the top of the clock tower to be 30°

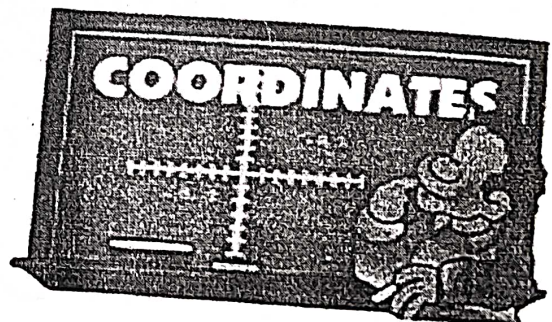
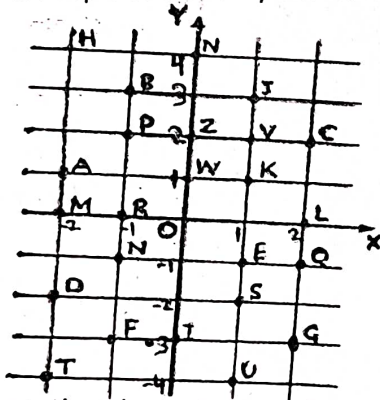
Based on the above information, answer the following:

- i) What is the distance between the viewer's eye and the top of the clock tower?
- ii) What is the height of clock tower?
- iii) The viewer walked to a position from where the elevation of the top becomes 60° . How much distance did he walk towards or away from the tower?

OR

How much should the height of the tower be increased so that the elevation of the top observed by the viewer is 60° at the same point.

Q38.



Based on the above information, answer the following:

- i) What is the distance between P and Q?
- ii) Find the coordinates of the mid-point of the segment DJ.
- iii) What type of a triangle is ZML?

OR

- iii) Find the ratio in which the x-axis divides the line segment joining the points K and F.