**Time Allowed: 90 minutes Maximum Marks: 40**

General Instructions:
1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

1. The number $\frac{7}{75}$ will have -
   (a) non-terminating repeating decimal expansion.
   (b) terminating decimal expansion.
   (c) non-terminating non repeating decimal expansion.
   (d) terminating non repeating decimal expansion
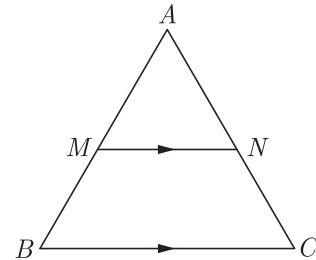
2. The pair of equations $y = 0$ and $y = -7$ has
   (a) one solution
   (b) two solutions
   (c) infinitely many solutions
   (d) no solution

3. The areas of two similar triangles are $81\,\text{cm}^2$ and $49\,\text{cm}^2$ respectively, then the ratio of their corresponding medians is
   (a) 7 : 9
   (b) 9 : 81
   (c) 9 : 7
   (d) 81 : 7

4. In an equilateral triangle ABC, AD is drawn perpendicular to BC meeting BC in D. The term AD^2 is equal to
   (a) $3BD^2$
   (b) $2BD^2$
   (c) BD^2
   (d) $\frac{1}{2}BD^2$

5. A single letter is selected at random from the word PROBABILITY. The probability that the selected letter is a vowel is
   (a) $\frac{2}{11}$
   (b) $\frac{3}{11}$
   (c) $\frac{4}{11}$
   (d) 0

6. In figure, $MN \parallel BC$ and $AM : MB = 1:2,$ then $\dfrac{ar(\Delta AMN)}{ar(\Delta ABC)} = \dots\dots\dots\dots\dots$

   (a) $\frac{1}{3}$
   (b) $\frac{1}{9}$
   (c) $\frac{8}{9}$
   (d) $\frac{5}{9}$

7. If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$ is
   (a) 1
   (b) $\dfrac{3}{4}$
   (c) $\dfrac{1}{2}$
   (d) $\dfrac{1}{4}$

8. If $\text{HCF}(336, 54) = 6$, $\text{LCM}(336, 54)$ will be
   (a) 2024
   (b) 3024
   (c) 1012
   (d) 1512

9. Two lines are given to be parallel. The equation of one of the lines is $4x + 3y = 14$, then the equation of the second line will be
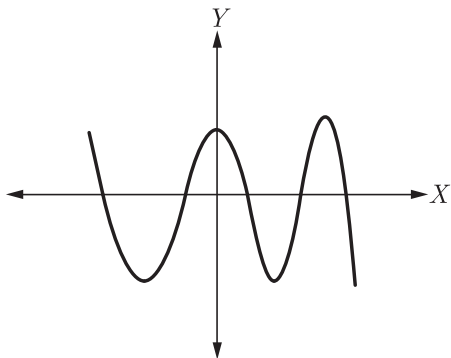   (a) $12x + 9x = 42$
   (b) $12x + 9y = 5$
   (c) $12x + 8y = 15$
   (d) $12x + 8y = 42$

10. The distance of the point $P(-6, 8)$ from the origin is
    (a) 8
   (b) $2\sqrt{7}$
    (c) 10
    (d) 6

11. The graph of $y = p(x)$, where $p(x)$ is a polynomial in variable x, is as follows.

The number of zeroes of $p(x)$ is ....

(a) 2

(b) 3

(c) 4

(d) 5

12. The decimal representation of $\frac{6}{1250}$ will terminate after how many places of decimal?

(a) 1

(b) 2

(c) 3

(d) 4

13. If $\cos A = \frac{2}{5}$, the value of $4 + 4\tan^2 A$ will be

(a) 1

(b) 2

(c) 4

(d) 25

14. If $\tan 5\phi = 1$ then ϕ is equal to

(a) 9°

(b) 90°

(c) 45°

(d) 30°

15. If the perimeter of a semi-circular protractor is 36 cm, then its diameter is

(a) 10 cm

(b) 14 cm

(c) 12 cm

(d) 16 cm

16. In the figure, PQ is parallel to MN. If $\frac{KP}{PM} = \frac{4}{13}$ and $KN = 20.4$ cm then KQ will be
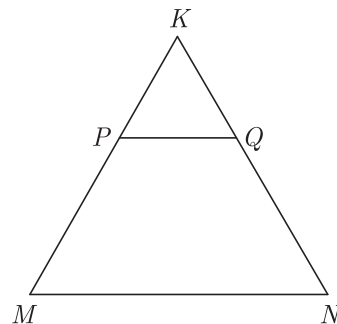

(a) 4.1 cm

(b) 5.2 cm

(c) 4.8 cm

(d) 5.4 cm

17. A ladder 25 m long just reaches the top of a building 24 m high from the ground. What is the distance of the foot of ladder from the base of the building?

(a) 9 m

(b) 10.5 m

(c) 14 m

(d) 7 m

18. The trigonometric ratio of $\tan A$ is equal to

(a) $\frac{\sin A}{\sqrt{1 - \cos^2 A}}$

(b) $\frac{\sin A}{\sqrt{1 - \sin^2 A}}$

(c) $\frac{\cos A}{\sqrt{1 - \sec^2 A}}$

(d) $\frac{1}{\sqrt{1 - \cot^2 A}}$

19. Select the value of k for which the pair of Linear equations $kx + y = d^2$ and $x + ky = 1$ have infinitely many solutions.

(a) 1

(b) 2

(c) 3

(d) 4

20. 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

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21. In the given factor tree what is the composite number x?
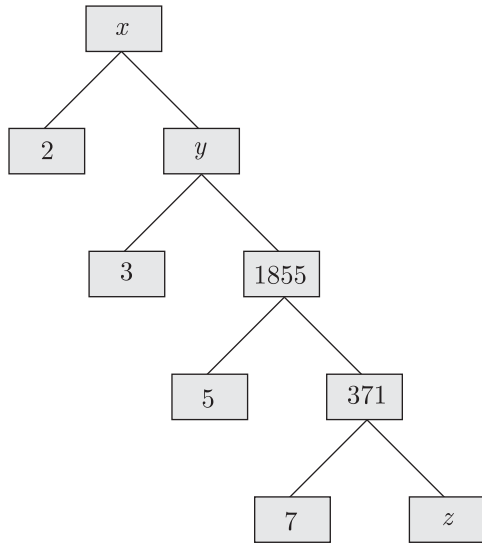
(a) 53   (b) 11130

(c) 5565   (d) 19438

22. If the centre of a circle is (3, 5) and end points of a diameter are (4, 7) and (2, y), then the value of y is

(a) 3   (b) -3

(c) 7   (d) 4

23. $\dfrac{\cos A}{1 + \tan A} - \dfrac{\sin A}{1 + \cot A} = ?$

(a) $\sin A - \cos A$ (b) $\sin A + \cos A$

(c) $\cos A - \sin A$ (d) $-\sin A - \cos A$

24. If $2x + y = 23$ and $4x - y = 19$, the value of $(5y - 2x)$ and $\left(\frac{y}{x} - 2\right)$ will be

(a) $-\frac{5}{7}$ and 31   (b) 31 and $-\frac{5}{7}$

(c) 37 and $\frac{2}{7}$ (d) $\frac{2}{7}$ and 37

25. Given that α and β are the zeroes of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$. Select the quadratic polynomial having α and β as its zeroes.

(a) $x^2 - 128x + 24$ (b) $x^2 - 24x + 128$

(c) $x^2 + 24x - 128$ (d) $x^2 + 128x + 24$

26. Two different dice are tossed together. What is the probability that the number on each die is even ?

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) $\frac{1}{6}$

27. A game consists of tossing a one-rupee coin 3 times and noting the outcome each time. Ramesh will win the game if all the tosses show the same result, (i.e either all three heads or all three tails) and loses the game otherwise. What is the probability that Ramesh will lose the game?

(a) $\frac{3}{8}$ (b) $\frac{3}{4}$

(c) $\frac{5}{8}$ (d) $\frac{1}{2}$

28. If $x \sin^3\theta + y \cos^3\theta = \sin\theta \cos\theta$ and $x \sin\theta = y \cos\theta$, then $x^2 + y^2$ is equal to

(a) 1   (b) 2

(c) 3   (d) 4

29. If $A(5,2)$, $B(2, -2)$ and $C(-2, t)$ are the vertices of a right angled triangle with $\angle B = 90°$, then the value of t will be

(a) 1   (b) 2

(c) 3   (d) 4

30. In the right triangle, B is a point on AC such that $AB + AD = BC + CD$. If $AB = x, BC = h$ and $CD = d$, then x will be

(a) $\frac{2hd}{2h+d}$ (b) $\frac{2hd}{h+d}$

(c) $\frac{hd}{h+2d}$ (d) $\frac{hd}{2h+d}$

31. If $P(9a - 2, -b)$ divides the line segment joining $A(3a + 1, -3)$ and $B(8a, 5)$ in the ratio 3:1, the values of a and b are

(a) 1, –3   (b) 1, 2

(c) 2, 3   (d) 3, 4

32. If $x = r \sin A \cos C$, $y = r \sin A \sin C$ and $z = r \cos A$, then $x^2 + y^2 + z^2$ is equal to

(a) $2r^3$ (b) $2r^2$

(c) r^3 (d) r^2

33. What are the HCF and LCM of 90 and 144 by the method of prime factorization.

(a) 36 and 360   (b) 720 and 18

(c) 18 and 720   (d) 360 and 36

34. In the given figure, BL and CM are medians of $\triangle ABC$, right angled at A. The term $4(BL^2 + CM^2)$ is equal to
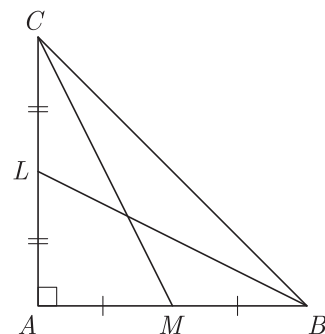
(a) $5BC^2$ (b) $4BC^2$

(c) $3BC^2$ (d) $2BC^2$

35. If two adjacent vertices of a parallelogram are $(3,2)$ and $(-1,0)$ and the diagonals intersect at $(2,-5)$ then find the co-ordinates of the other two vertices.

(a) $(-14,4)$ and $D(-10,\ 5)$

(b) $(4,-14)$ and $D(5,-10)$

(c) $(1,-12)$ and $D(5,-10)$

(d) $(-12,1)$ and $D(-10,\ 5)$

36. If the perimeter of a protractor is 72 cm, what is its area? Use $\pi = \frac{22}{7}$

(a) 616 cm^2 (b) 308 cm^2

(c) 412 cm^2 (d) 824 cm^2

37. In the given figure, AB is the diameter of the largest semi-circle. $AB = 21$ cm, $AM = MN = NB$. Semi-circle are drawn with AM, MN and NB as shown. What is the area of the shaded region? Use $\pi = \frac{22}{7}$
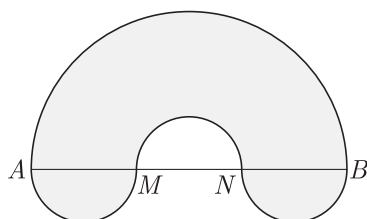

(a) 105 cm^2 (b) 210.5 cm^2

(c) 192.5 cm^2 (d) 225 cm^2

38. If the sum and product of the zeroes of the polynomial $ax^2 - 5x + c$ are equal to 10 each, the values of a and c are

(a) 6 and $\frac{3}{2}$ (b) $\frac{3}{2}$ and 6

(c) $\frac{1}{2}$ and 5   (d) 5 and $\frac{1}{2}$

39. An elastic belt is placed around the rim of a pulley of radius 5 cm. From one point C on the belt elastic belt is pulled directly away from the centre O of the pulley until it is at P, 10 cm from the point O. What is the length of the belt that is still in contact with the pulley.(Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)
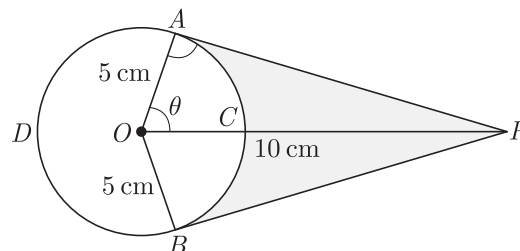
(a) 21 cm^2 (b) 34 cm^2

(c) 28 cm^2 (d) 32 cm^2

40. In an election contested between A and B, A obtained votes equal to twice the no. of persons on the electoral roll who did not cast their votes and this later number was equal to twice his majority over B. If there were 1,8000 persons on the electoral roll. How many votes for B.

(a) 2000   (b) 8000

(c) 6000   (d) 1000

SECTION C

Case study based questions:

Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Based Questions: (41-45)

The Republic Day parade, first held in 1950, has been a yearly ritual since. The parade marches from the Rashtrapati Bhawan along the Rajpath in New Delhi. Several regiments of the army, navy, and air force, along with their bands, march to India Gate. The parade is presided over by the President of India, who is the Commander-in-Chief of the Indian Armed Forces. As he unfurls the tricolour, the national anthem is played. The regiments of the Armed Forces then start their march past. Prestigious awards like Kirti Chakra, Ashok Chakra, Paramvir Chakra and Vir Chakra are given out by the President. Nine to twelve different regiments of the Indian Army, in addition to the Navy and Air Force march toward India Gate along with their bands. Contingents of paramilitary forces and other civil forces also participate in the parade.

On 71th republic day parade, captain RS Meel is planing for parade of following two group:

(a) First group of Army troops of 624 members behind an army band of 32 members.

(b) Second group of CRPF troops with 468 soldiers behind the 228 members of bikers.

These two groups are to march in the same number of columns. This sequence of soldiers is followed by different states Jhanki which are showing the culture of the respective states.

41. What is the maximum number of columns in which the army troop can march?

(a) 8   (b) 16

(c) 4   (d) 32

42. What is the maximum number of columns in which the CRPF troop can march?

(a) 4   (b) 8

(c) 12   (d) 16

43. What is the maximum number of columns in which total army troop and CRPF troop together can march past?

(a) 2   (b) 4

(c) 6   (d) 8

44. What should be subtracted with the numbers of CRPF soldiers and the number of bikers so that their maximum number of column is equal to the maximum number of column of army troop?

(a) 4 Soldiers and 4 Bikers

(b) 4 Soldiers and 2 Bikers

(c) 2 Soldiers and 4 Bikers

(d) 2 Soldiers and 2 Bikers

45. What should be added with the numbers of CRPF soldiers and the number of bikers so that their maximum number of column is equal to the maximum number of column of army troop?
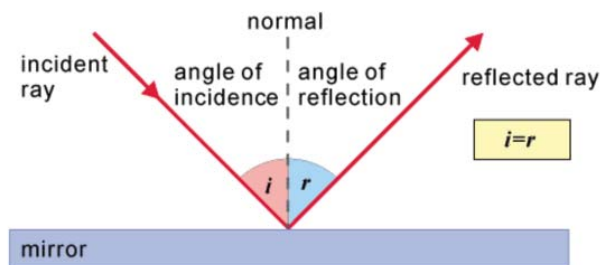
(a) 4 Soldiers and 4 Bikers

(b) 12 Soldiers and 12 Bikers

(c) 6 Soldiers and 6 Bikers

(d) 12 Soldiers and 6 Bikers

Case Based Questions: (46-50)

The law of reflection states that when a ray of light reflects off a surface, the angle of incidence is equal to the angle of reflection.

Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.5 m above the ground. The distance of Ramesh and the pole from the mirror are 1.8 m and 6 m respectively.
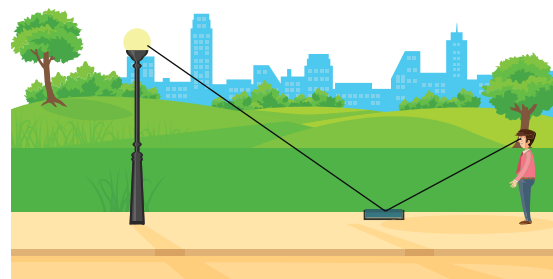
46. Which criterion of similarity is applicable to similar triangles?

(a) SSA   (b) ASA

(c) SSS   (d) AA

47. What is the height of the pole?

(a) 6 metres   (b) 8 metres

(c) 5 metres   (d) 4 metres

48. If angle of incidence is i, find $\tan i$.

(a) $\tan i = \frac{5}{6}$ (b) $\tan i = \frac{6}{5}$

(c) $\tan i = \frac{3}{5}$ (d) $\tan i = \frac{5}{3}$

49. Now Ramesh move behind such that distance between pole and Ramesh is 13 meters. He place mirror between him and pole to see the reflection of light in right position. What is the distance between mirror and Ramesh ?

(a) 7 metres   (b) 3 metres

(c) 5 metres   (d) 4 metres

50. What is the distance between mirror and pole?

(a) 9 metres   (b) 8 metres

(c) 12 metres   (d) 10 metres

SAMPLE PAPER - 7 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(a)	Ch-1	31
2	(d)	Ch-3	13
3	(c)	Ch-4	14
4	(a)	Ch-4	52
5	(c)	Ch-8	19
6	(b)	Ch-4	25
7	(c)	Ch-6	12
8	(b)	Ch-1	38
9	(b)	Ch-3	28
10	(c)	Ch-5	26
11	(d)	Ch-2	27
12	(b)	Ch-1	S-15
13	(d)	Ch-6	41
14	(a)	Ch-6	123
15	(b)	Ch-7	12
16	(c)	Ch-4	33
17	(d)	Ch-4	S-125
18	(b)	Ch-6	57
19	(a)	Ch-3	42
20	(b)	Ch-8	27
21	(b)	Ch-1	36
22	(a)	Ch-5	14
23	(c)	Ch-6	74
24	(b)	Ch-3	30
25	(b)	Ch-2	45

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(b)	Ch-8	57
27	(b)	Ch-8	103
28	(a)	Ch-6	84
29	(a)	Ch-5	43
30	(a)	Ch-4	80
31	(a)	Ch-5	96
32	(d)	Ch-6	109
33	(c)	Ch-1	S-17
34	(a)	Ch-4	65
35	(c)	Ch-5	58
36	(b)	Ch-7	53
37	(c)	Ch-7	65
38	(c)	Ch-2	S-35
39	(a)	Ch-7	75
40	(c)	Ch-3	54
41	(b)	Ch-1	76
42	(c)	Ch-1	77
43	(b)	Ch-1	78
44	(a)	Ch-1	79
45	(b)	Ch-1	80
46	(d)	Ch-4	100
47	(c)	Ch-4	101
48	(b)	Ch-4	102
49	(b)	Ch-4	103
50	(d)	Ch-4	104

* S- = Self Test Question