CKSC CODE: 133

CENTRAL KERALA SAHODAYA

TERM 1 MODEL EXAMINATION-2021

Subject-Mathematics (Standard) 041

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 Given $HCF(306,657) = 9, find\ LCM(306,657)$.
(a) 45647 (b) 65474 (c) 22338 (d) 33822

2 For what value of k, the pair of equations $4x - 3y = 9, 2x + ky = 11$ has no solution?
(a) $\frac{-3}{2}$ (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) $\frac{7}{2}$

3 If $\Delta ABC \sim \Delta PQR$, perimeter of $\Delta ABC = 32\ cm$, perimeter of $\Delta PQR = 48\ CM\ and\ PR = 6\ cm$ then find the length of AC.
(a) 5 cm (b) 4 cm (c) 3 cm (d) 2 cm

4 Two different dice are tossed together. Find the probability that the product of the two numbers on the top of the dice is 6.
(a) $\frac{1}{3}$ (b) $\frac{1}{5}$ (c) $\frac{1}{7}$ (d) $\frac{1}{9}$

5 If $tan\alpha = \sqrt{3}\ and \tan\beta = \frac{1}{\sqrt{3}}, 0 < \alpha, \beta < 90°$, find the value of $\sin(\alpha + \beta)$.
(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) $\frac{1}{\sqrt{2}}$

6 Find the ratio in which y-axis divides the line segment joining the points A(5, -6) and B(-1, -4)
(a) 2:1 (b) 2;3 (c) 2:5 (d) 5:1

7 If one zero of $7x^2 + 6x + k$ is the reciprocal of the other, find the value of k.
(a) 5 (b) 7 (c) 9 (d) 11

8 The value of $2\ sin^2 30° - 3cos^2 45° + tan^2 60° + 3sin^2 90°$ is
(a) 1 (b) 5 (c) 0 (d) none of these

9. The largest number which exactly divides 280 and 1245 leaving remainders 4 and 3 respectively is ……..
(a) 36 (b) 54 (c) 138 (d) 710.

10. The sum and the product of the zeroes of polynomial $6x^2 - 5$ respectively are
$(a)\ 0, \frac{-6}{5}$ (b) $0, \frac{6}{5}$ $(c) 0, \frac{5}{6}$ (d) $0, \frac{-5}{6}$

11. If α, β are the zeroes of the polynomial $3x^2 - 5x + 1$, find the value of $\alpha^4\beta^3 + \alpha^3\beta^4$.
(a) $\frac{1}{27}$ (b) $\frac{5}{3}$ (c) $\frac{5}{81}$ (d) $\frac{1}{3}$

12. If $\cot A + \tan A = 2$, then find the value of $cot^2A + tan^2A$.

(a) 2 (b) $\sqrt{2}$ (c) 3 (d) $\sqrt{3}$

13. Find the area of the circle that can be inscribed in a square of side 6 cm.

(a) $9\pi cm^2$ (b) $4\pi cm^2$ (c) $36\ \pi cm^2$ (d) $16\ \pi cm^2$

14. Find the coordinates of the mid-point of the line segment joining the points $P(6,0)\ and\ Q(0,12)$.

(a) (6,12) (b) (2, 4) (c) (6, 6) (d) (3, 6)

15. Write the number of solutions of the following pair of linear equations:

$x + 2y - 8 = 0, 2x + 4y = 16$

(a) Exactly one solution (b) Infinitely many solutions (c) no solution (d) Two solutions

16. If $cosec\ \theta + \cot\theta = x$, find the value of $cosec\ \theta - \cot\theta$

(a) $x + 1$ (b) $x - 1$ (c) $\frac{1}{x}$ (d) $2x$

17. The decimal expansion of the rational number $\frac{47}{2^5 \times 5^2}$ will terminate after how many places of decimal?

(a) 2 (b) 5 (c) 7 (d) 3

18. Find the value(s) of k for which the pair of linear equations $kx + y = k^2\ and\ x + ky = 1$ have infinitely many solutions.

(a) 3 (b) 7 (c) 1 (d) 10

19. If the perimeter of a circle is half of the area numerically, then find the radius of the circle.

(a) 5 units (b) 4 units (c) 3 units (d) 2 units

20. Two friends were born in the year 2000. What is the probability that they have the same birthday?

(a) $\frac{1}{365}$ (b) $\frac{364}{365}$ (c) $\frac{1}{366}$ (d) $\frac{365}{366}$

SECTION B

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

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

(a) $a = 1,\ b = -3$ (b) $a = -3,\ b = 1$ (c) $a = -1,\ b = -3$ (d) $a = 1,\ b = 3$

22. Two tankers contain 620 litres and 840 litres of diesel respectively. Find the maximum capacity of a container which can measure the diesel of both the tankers in exact number of times.

(a) 10 litres (b) 20 litres (c) 30 litres (d) 40 litres

23. If $\alpha\ and\ \beta$ are the zeroes of the polynomial $f(x) = x^2 - 5x + k\ such\ that\ \alpha - \beta = 1$, find the value of k.

(a) 10 (b) 12 (c) 5 (d) 6

24. Find the value of m, if the distance between the points $X(-2, -12)\ and\ Y(m, -4)\ is\ 8\ units$.

(a) 2 (b) 3 (c) -2 (d) -3

25. If $\sin\theta = \frac{3}{5}$, $then\ find\ \sin\theta - \cot\theta$

(a) $\frac{5}{3}$ (b) $\frac{-2}{7}$ (c) $\frac{7}{11}$ (d) $\frac{-11}{15}$

26. Find a quadratic polynomial whose zeroes are $5 - 3\sqrt{2}\ and\ 5 + 3\sqrt{2}$.

(a) $x^2 - 8x + 7$ (b) $x^2 - 10x + 7$ (c) $x^2 - 8x + 5$ (d) $x^2 - 10x + 5$

27. 3 bells ring at an interval of 4, 7 and 14 minutes. All three bell rang at 6 am, when the three bells will ring together next?

(a) 6.10 am (b) 6.18 am (c) 6. 24 am (d) 6.28 am

28. $\frac{1}{\sec A - \tan A} - \frac{1}{\cos A} = \cdots$

(a) tan A (b) sin A (c) cos A (d) cot A

29. Find the probability of getting a sum of more than 8 when two dice are rolled.

(a) $\frac{3}{18}$ (b) $\frac{5}{18}$ (c) $\frac{7}{36}$ (d) $\frac{11}{36}$

30. If one zero of the quadratic polynomial $p(x) = 3x^2 - 8x - 2k - 1$ is seven times the other, then find the value of k.

(a) $\frac{3}{5}$ (b) $\frac{-2}{7}$ (c) $\frac{-5}{3}$ (d) $\frac{-7}{11}$

31. Two numbers are in the ratio 21:17. If their HCF is 5, find the numbers.

(a) 105, 85 (b) 120, 75 (c) 115, 65 (d) 125, 95

32. Find the probability of getting 53 Fridays in a leap year.

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{5}{7}$

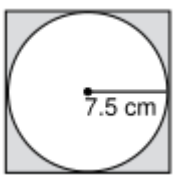
33. Obtain the condition for the following system of linear equations to have a unique solution:

$ax + by = c\ \ and\ lx + my = n.$

(a) $ab \neq lm$ (b) $al = bm$ (c) $am \neq bl$ (d) $ab = lm$

34. In the figure, a circle of radius 7.5 cm is inscribed in a square. Find the area of the shaded region.

$(Use\ \pi = 3.14)$



(a) 45.54 cm^2 (b) 46.345 cm^2 (c) 47.23 cm^2 (d) 48.375cm^2

35. Given $\sqrt{3}\tan 5\theta = 1$, find the value of θ.

(a) 6° (b) 9° (c) 20° (d) 12°

36. The length of an arc of a circle of radius 12 cm is $4\pi\ cm$. Find the central angle of this arc.
(a)30° (b) 45° (c) 60° (d) 90°

37. If $x = p, y = q$ is a solution of the equations $x + 2y + 1 = 0\ and\ 2x - 3y - 12 = 0$, then find the values of $p\ and\ q$.

(a) $p = 3, q = -2$ (b) $p = 5, q = -2$ (c) $p = 2, q = -5$ (d) $p = 7, q = -3$

38. Find the prime factorization of the denominator of rational number expressed as $6.\overline{12}$ in simplest form
(a) 3×5 (b) $3 \times 5 \times 7$ (c) 3×11 (d) 5×7

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

(a) 15 (b) 23 (c) 33 (d) 40

40. Two numbers are in the ratio 5:6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Form linear equations to represent the above situation.

(a) $5x - 6y = 0, 8x - 3y = 5$ (b) $3x - 4y = 9, 5x - 2y = 7$

(c) $7x - 3y = 0, 5x - 4y = 5$ (d) $6x - 5y = 0, 5x - 4y = 8$

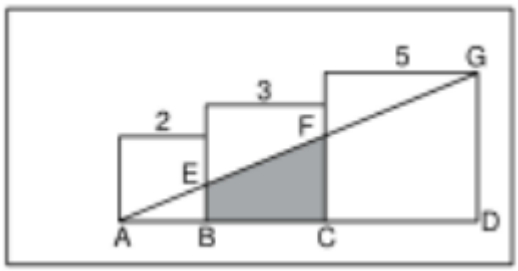
SECTION C

Case study based questions:

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

Q41-Q45 are based on Case Study-1

Case Study-1



Three squares have dimensions as indicated in the diagram above. Answer the following questions.

41. A pair of similar triangles from the figure is:

(a) $\Delta ABE \sim \Delta AFC$ (b) $\Delta AEB \sim \Delta ACF$ (c) $\Delta ABE \sim \Delta ACF$ (c) $\Delta ABE \sim \Delta AGD$

42. What is the length of CF?

(a) $\frac{5}{2}\ units$ (b) 5 units (c) 4 units (d) $\frac{5}{4}\ units$

43. Area of ΔACF is:

(a) $\frac{25}{4}\ sq.units$ (b) $25\ sq.units$ (c) $5\ sq.units$ (d) $4\ sq.units$

44. Area of the shaded region is :

(a) 20 sq. units (b) $21\ sq.units$ (c) $\frac{21}{4}\ sq.units$ (d) $10\ sq.units$

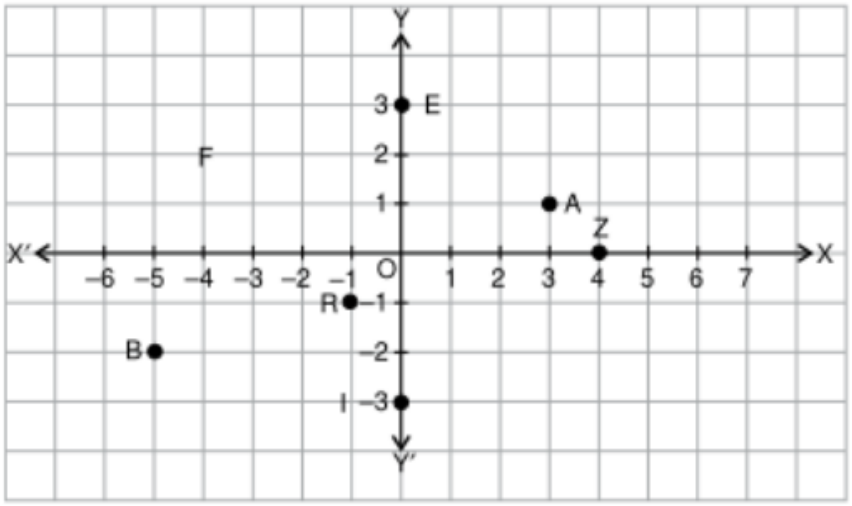
45. Ratio of the areas of $\Delta ABE\ and\ \Delta ADG$ is:

(a) 2:25 (b) 25:1 (c) 3:25 (d) 1:25

Q46-Q50 are based on Case Study-2

Case Study-2

For a sports event, certain points were marked on a rectangular ground denoting positions of different drills.



46. The distance between the points A and E is:

(a) $\sqrt{10}\ units$ (b) $\sqrt{13}\ units$ (c) $\sqrt{15}\ units$ (d) $\sqrt{17}\ units$

47. What type of triangle is formed by joining the points A, Z and R?

(a) Scalene (b) Isosceles (c) Equilateral (d) Right angled

48. The equation of the line EI is:

(a) $x = -5$ (b) $x = 6$ (c) $x = 0$ (d) $y = 0$

49. The ratio in which the x −axis divides the join of A and R is:

(a) 1: 3 (b) 2: 3 (c) 1: 1 (d) 2: 1

50. The distance of the point B from F is:

(a) 5 units (b) $\sqrt{5}units$ (c) $2\sqrt{5}units$ (d) $5\sqrt{2}units$