**Sample Question Paper -** AG-TMC-TS-T
**Class – X Session -2021-22**
**TERM 1**
**Subject- Mathematics (Standard) 041**

**Time Allowed: 1 hour and 30 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. Attempt any 16 questions.
3. Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

**Section A**

**Attempt any 16 questions**

1. The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is **[1]**

   a) 875 b) 65

   c) 13 d) 1750

2. If the system of equations **[1]**
   3x + y = 1 and
   (2k - 1) x + (k - 1) y = 2k + 1
   is inconsistent, then k =

   a) -1 b) 1

   c) 2 d) 0

3. In △ABC, it is given that AB = 9 cm, BC = 6 cm and CA = 7.5 cm. Also, △DEF is given such that EF = 8 cm and △DEF ~ △ABC. Then, perimeter of △DEF is **[1]**

   a) 30 cm b) 22.5 cm

   c) 27 cm d) 25 cm

4. If 29x + 37y = 103 and 37x + 29y = 95 then **[1]**

   a) x = 3, y = 2 b) x = 2, y = 1

   c) x = 2, y = 3 d) x = 1, y = 2

5. If 8 tan x = 15, then sin x - cos x is equal to **[1]**

   a) $\frac{17}{7}$ b) $\frac{8}{17}$

   c) $\frac{7}{17}$ d) $\frac{1}{17}$

6. The least positive integer divisible by 20 and 24 is **[1]**

   a) 480 b) 240

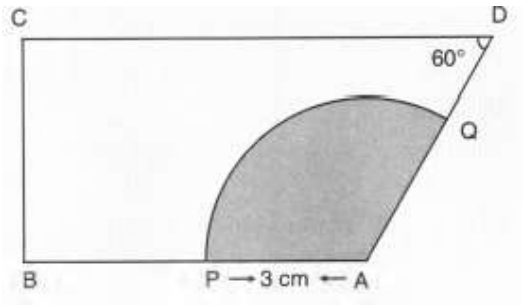
c) 360 d) 120

7. If -2 and 3 are the zeros of the quadratic polynomial $x^2 + (a + 1)x + b$ then **[1]**

a) a = 2, b = 6 b) a = 2, b = -6

c) a = -2, b = -6 d) a = -2, b = 6

8. In Fig, the area of the shaded region is **[1]**




a) $9\pi$ $cm^2$ b) $6\pi$ $cm^2$

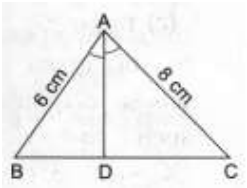
c) $7\pi$ $cm^2$ d) $3\pi$ $cm^2$

9. A quadratic polynomial whose product and sum of zeroes are $\frac{1}{3}$ and $\sqrt{2}$ respectively is **[1]**

a) $3x^2 - x + 3\sqrt{2}x$ b) $3x^2 - 3\sqrt{2}x + 1$

c) $3x^2 + x - 3\sqrt{2}x$ d) $3x^2 + 3\sqrt{2}x + 1$

10. In a $\triangle$ ABC it is given that AB = 6 cm, AC = 8 cm and AD is the bisector of $\angle$A. Then, BD : DC = ? **[1]**




a) 3 : 4 b) 9 :16

c) $\sqrt{3} : 2$ d) 4 : 3

11. A card is selected at random from a well shuffled deck of 52 playing cards. The probability of its being a face card is **[1]**

a) $\frac{3}{26}$ b) $\frac{3}{13}$

c) $\frac{1}{26}$ d) $\frac{4}{13}$

12. $7 \times 11 \times 13 + 13$ is a/an: **[1]**

a) odd number but not composite b) square number

c) prime number d) composite number

13. The circumference of a circle is 100 cm. The side of a square inscribed in the circle is **[1]**

a) $\frac{50}{\pi}$ b) $50\sqrt{2}$

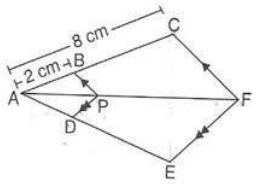
c) $\frac{100}{\pi\sqrt{2}}$ d) $\frac{50\sqrt{2}}{\pi}$

14. If the sum of the areas of two circles with radii $r_1$ and $r_2$ is equal to the area of a circle of radius r, then $r_1^2 + r_2^2$ **[1]**

a) $r^2$ b) $<r^2$

c) None of these d) $>r^2$

15. In the given figure if $BP||CF$, $DP||EF$,then AD : DE is equal to **[1]**




a) 1 : 3 b) 1 : 4

c) 3 : 4 d) 2 : 3

16. If cot A + $\frac{1}{\cot A}$ = 2 then $\cot^2 A + \frac{1}{\cot^2 A}$ = **[1]**

a) 1 b) -1

c) 2 d) 0

17. The sum of the numerator and denominator of a fraction is 18. If the denominator is increased by 2, the fraction reduces to $\frac{1}{3}$. The fraction is **[1]**

a) $\frac{-7}{11}$ b) $\frac{5}{13}$

c) $\frac{-5}{13}$ d) $\frac{7}{11}$

18. A bag contains 3 red, 5 black and 7 white balls. A ball is drawn from the bag at random. The probability that the ball drawn is not black, is: **[1]**

a) $\frac{5}{10}$ b) $\frac{2}{3}$

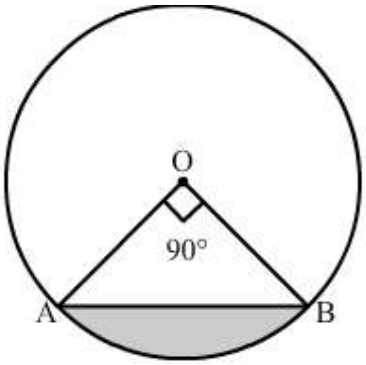
c) $\frac{1}{3}$ d) $\frac{9}{15}$

19. The HCF of two consecutive numbers is **[1]**

a) 2 b) 0

c) 3 d) 1

20. In fig, the shaded area is (radius = 10cm) **[1]**




a) 25 ($\pi$ – 2) $cm^2$ b) 5 ($\pi$–2) $cm^2$

c) 25 ($\pi$+2) $cm^2$ d) 50 ($\pi$–2) $cm^2$

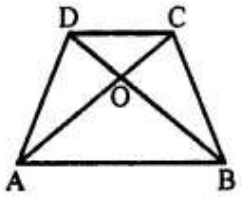
**Section B**

**Attempt any 16 questions**

21. The graphs of the equations 2x + 3y - 2 = 0 and x - 2y - 8 = 0 are two lines which are **[1]**

a) perpendicular to each other
b) parallel
c) intersecting exactly at one point
d) coincident

22. In the given figure, ABCD is a trapezium whose diagonals AC and BD intersect at O such that OA = (3x - 1) cm, OB = (2x +1) cm, OC = (5x - 3) cm and OD = (6x - 5) cm. Then, x = ? **[1]**




a) 4
b) 2
c) 3.5
d) 3

23. If $a = 2^3 \times 3, b = 2 \times 3 \times 5, c = 3^n \times 5$ and LCM (a, b, c) $= 2^3 \times 3^2 \times 5$, then n = **[1]**

a) 1
b) 4
c) 3
d) 2

24. If a cot $\theta$ + b cosec $\theta$ = p and b cot $\theta$ + a cosec $\theta$ = q, then $p^2 - q^2$ = **[1]**

a) $a^2 + b^2$
b) $a^2 - b^2$
c) $b^2 - a^2$
d) b - a

25. In a $\triangle$ABC, $\angle C = 3\angle B = 2(\angle A + \angle B)$, then $\angle B$ = ? **[1]**

a) 60°
b) 40°
c) $80^o$
d) 20°

26. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is **[1]**

a) 9 cm
b) 10 cm
c) 8 cm
d) 20 cm

27. $\triangle$ABC $\sim$ $\triangle$DEF such that ar ($\triangle$ABC) = 36 cm² and ar ($\triangle$DEF) = 49 cm². Then, the ratio of their corresponding sides is **[1]**

a) 7 : 6
b) $\sqrt{6} : \sqrt{7}$
c) 36 : 49
d) 6 : 7

28. The coordinates of the mid-point of the line segment joining the points (-2, 3) and (4, -5) are **[1]**

a) (0, 0)
b) (-1, 1)
c) (1, -1)
d) (-2, 4)

29. If sec $\theta$ + tan $\theta$ = x, then sec $\theta$ = **[1]**

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

30. Half the perimeter of a rectangular garden, whose length is 4m more than its width is 36m. The area of the garden is **[1]**

a) 320 $m^2$ b) 300 $m^2$

c) 400 $m^2$ d) 360 $m^2$

31. The number $(\sqrt{3}+\sqrt{5})^2$ is **[1]**

a) an irrational number b) an integer

c) a rational number d) not a real number

32. The decimal expansion of the rational number $\frac{37}{2^2\times5}$ will terminate after **[1]**

a) two decimal places b) one decimal place

c) four decimal places d) three decimal places

33. $\cos^2 30^\circ \cos^2 45^\circ + 4\sec^2 60^\circ + \frac{1}{2}\cos^2 90^\circ - 2\tan^2 60^\circ$ = ? **[1]**

a) $\frac{75}{8}$ b) $\frac{73}{8}$

c) $\frac{83}{8}$ d) $\frac{81}{8}$

34. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is **[1]**

a) 22 : 7 b) 14 : 11

c) 11 : 14 d) 7 : 22

35. Two dice are thrown simultaneously. The probability of getting a doublet is **[1]**

a) $\frac{1}{6}$ b) $\frac{1}{3}$

c) $\frac{2}{3}$ d) $\frac{1}{4}$

36. The sum of the digits of a two digit number is 9. Nine times this number is twice the number obtained by reversing the digits, then the number is **[1]**

a) 72 b) 27

c) 18 d) 81

37. If a = ($2^2 \times 3^3 \times 5^4$) and b = ($2^3 \times 3^2 \times 5$) then HCF (a, b) = ? **[1]**

a) 360 b) 90

c) 180 d) 540

38. If $2\cos 3\theta = 1$ then $\theta$= ? **[1]**

a) 30° b) 10°

c) 15° d) 20°

39. A letter is chosen at random from the word ASSASSINATION. The probability that it is a vowel is **[1]**

a) $\frac{6}{13}$ b) $\frac{7}{13}$

c) $\frac{6}{31}$ d) $\frac{3}{13}$

40. Point $P\left(\frac{a}{8}, 4\right)$ is the mid-point of the line segment joining the points A(- 5, 2) and B(4, 6). The **[1]**

value of **a** is:

a) -4 b) 4

c) -8 d) -2

**Section C**

**Attempt any 8 questions**

**Question No. 41 to 45 are based on the given text. Read the text carefully and answer the questions:**

Ankit's father gave him some money to buy avocado from the market at the rate of $p(x) = x^2 - 24x + 128$.

Let $\alpha, \beta$ are the zeroes of p(x).



41. Find the value of $\alpha$ and $\beta$, where $\alpha < \beta$. **[1]**

a) 8, 16 b) 4, 9

c) 8, 15 d) -8, -16

42. Find the value of $\alpha + \beta + \alpha\beta$. **[1]**

a) 158 b) 152

c) 151 d) 155

43. The value of p(2) is **[1]**

a) 81 b) 83

c) 80 d) 84

44. If $\alpha$ and $\beta$ are zeroes of $x^2 + x - 2$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ = **[1]**

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

c) $\frac{1}{5}$ d) $\frac{1}{4}$

45. If sum of zeroes of $q(x) = kx^2 + 2x + 3k$ is equal to their product, then k = **[1]**

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

c) $\frac{-1}{3}$ d) $\frac{2}{3}$

**Question No. 46 to 50 are based on the given text. Read the text carefully and answer the questions:**

Students of residential society undertake to work for the campaign **Say no to Plastics**. Group A took the region under the coordinates (3, 3), (6, y), (x, 7) and (5, 6) and group B took the region under the

coordinates (1, 3), (2, 6), (5, 7) and (4, 4).



46. If region covered by group A forms a parallelogram, where the coordinates are taken in the given order, then **[1]**

a) x = 8, y = 4 b) x = 2, y = 4

c) x = 4, y = 8 d) x - 4, y = 2

47. Perimeter of the region covered by group A is **[1]**

a) $(\sqrt{10}+\sqrt{13})$ units b) none of these

c) $\sqrt{13}$ units d) $\sqrt{10}$ units

48. If the coordinates of region covered by group B, taken in the same order forms a quadrilateral, then the length of each of its diagonals is **[1]**

a) $3\sqrt{2}$ units, $2\sqrt{2}$ units b) $4\sqrt{2}$ units, $2\sqrt{2}$ units

c) $3\sqrt{2}$ units, $2\sqrt{2}$ units d) none of these

49. If region covered by group B forms a rhombus, where the coordinates are taken in given order, then the perimeter of this region is **[1]**

a) $2\sqrt{10}$ units b) $\sqrt{10}$ units

c) $4\sqrt{10}$ units d) $3\sqrt{10}$

50. The coordinates of the point which divides the join of points P($x_1$, $y_1$) and Q($x_2$, $y_2$) internally in the ratio m : n is **[1]**

a) $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$ b) $\left(\frac{mx_2+ny_2}{m+n}, \frac{mx_1+ny_1}{m+n}\right)$

c) none of these d) $\left(\frac{mx_1+ny_1}{m+n}, \frac{mx_2+ny_2}{m+n}\right)$

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