Question Paper

Class-XI (Session : 2020-21)

Subject-Mathematics

Time Allowed : 3 hrs **Maximum Marks : 85**

Special Instructions:-

Same as that of Previous Years Annual question paper March 2020.

(i) All questions are compulsory. Marks allotted to each question are indicated aganist it.

(ii) 30% more internal choices have been provided from 70% of the syllabus, as 30% syllabus has been deleted for the session 2020-21 only. You have to attempt only one of them.

(iii) Star (*) marked questions are based on PISA format.

(iv) Try to solve the questions in serial order as far as possible.

1. If $x=\{1,3,5\}$, $Y=\{1,2,3\}$ then XUY is 1

   (a) $\{1,2,4,5\}$ (b) $\{1,2,3,5\}$ (c) $\{1,3,5\}$ (d) none of these

2. $(A')'$ is equal to 1

   (a) A (b) U (c) ϕ (d) A'

3. A function f is defined by $f(x)=2x-5$ the the value of $f(-3)$ is 1

   (a) -5 (b) -11 (c) 11 (d) 1

4. $\text{Sin}\left(\frac{3\pi}{2}+\theta\right)$ is equal to 1

   (a) $\text{Sin}\,\theta$ (b) $-\text{Sin}\,\theta$ (c) $\text{Cos}\,\theta$ (d) $-\text{Cos}\,\theta$

5. 25° is equal to how many radians? 1

   (a) $\frac{36\pi}{5}$ (b) $\frac{5\pi}{36}$ (c) $\frac{7\pi}{36}$ (d) none of these

6. $(i)^{-35}$ in equal to 1

   (a) i (b) $-i$ (c) 1 (d) -1

schools.aglasem.com
aglasem.com

7. If $\frac{1}{\lfloor 8} + \frac{1}{\lfloor 9} = \frac{x}{\lfloor 10}$ then x is equal to (1)

(a) 10 (b) 20 (c) 9 (d) 100

8. The co-ordinates of foci of an ellipse $9x^2+4y^2=36$ (1)

(a) $(0,\pm\sqrt{5})$ (b) $(\pm 5,0)$ (c) (0,0) (d) none of these

9. $\lim_{x \to '0} \frac{\text{Sin } 3x}{\text{Sin } 5x}$ equal to (1)

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

10. Derivative of cosec x is (1)

(a) Casec x Cot x (b) –Cosec x Cot x

(c) tan x Cot x (d) none of these

11. If $\left(\frac{x}{3}+1, y-\frac{2}{3}\right)=\left(\frac{5}{3},\frac{1}{3}\right)$, find the value of x and y. (2)

12. A wheel makes 360 revolutions in one minute through radians how many radions does it turn in one second. (2)

Or

Find the value of Cos (–1710°)

13. Find the multiplicative inverse of a complex number $z = \sqrt{5} + 3i$ (2)

Or

For any positive integer n, prove that

$i^n + i^{n+1} + i^{n+2} + i^{n+3} + i^{n+4} + i^{n+5} + i^{n+6} + i^{n+7} = 0$

14. Write the converse of the statement (2)

(i) If a number n is even. then n^2 in even.

(ii) If two integers a and b are such that a>b then a–b is always a positive integer.

schools.aglasem.com

aglasem.com

15. In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. How many like tennis only and not cricket? How many like tennis? 3½

16. Solve the inequality. $x + y < 5$ graphically. 3½

Or

Solve the following system of inequalities graphically.
$x + y \leq 6,\ x + y \geq 4$

17. In how many of the distinct permutations of the letters in MISSISSIPPI do the four I's not come together. 3½

Or

Determine the number of a 5 cards combination out of a deck of 52 cards if each selection of 5-cards has exactly one king.

18. Find the sum of series upto n terms. 3½
$5 + 55 + 555 + ...$

Or

Find sum of all natural numbers lying between 100 and 1000 which are multiple of 5.

19. The vertices of a triangle PQR are P (2,1), Q (–2,3) R (4,5). Find equation of median through the vertex R. 3½

Or

Find the equation of line perpendicular to the line $x–2y + 3 = 0$ and passing through the point (1, –2)

20. Find the equation of hyperbola having vertices $(0,\pm3)$ foci $(0,\pm5)$. 3½

Or

Find the centre and radius of the circle.
$x^2 + y^2 – 4x – 8y – 45 = 0$

21. Using principle of mathematical induction prove that 3½

$$\frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + ... + \frac{1}{(3n-1)(3n-2)} = \frac{n}{6n+4}$$

schools.aglasem.com
aglasem.com

22. Find the ratio in which the line segment joining the point (4,8,10) and (6,10,–8) is divided by the YZ-Plane. 3½

23. Find the derivative of the function. 3°

$$f(n) = \frac{x + \text{Cos } x}{\tan x}$$

Or

Find the derivative of x sin x from first Principle.

24. Find the range and domain of the function. 3½

$$f(x) = \sqrt{9 - x2}$$

Or

If $f(x) = x^2$ find $\frac{f(1.1) - f(1)}{(1.1 - 1)}$

25. Prove that $\frac{\text{Sin } 5x - 2 \sin 3x + \sin x}{\text{Cos } 5x - \text{Cos } x} = \tan x$ 3½

Or

Find the general solution of the equation $\text{Sin } 2x + \text{Cos } x = 0$

26. Let $z_1 = 2 - i$, $z_2 = -2 + i$ Find $\text{Re}\left(\frac{z_1 \overline{z_2}}{z_1}\right)$ 3½

27. The coefficients of three consecutive terms in the expansion of $(1 + x)^n$ are in the ratio 1:7:42 find 'n'. 5

Or

Evaluate $\left(\sqrt{3} + \sqrt{2}\right)^6 - \left(\sqrt{3} - \sqrt{2}\right)^6$

schools.aglasem.com
aglasem.com

28. If $\tan x = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$ find the value of $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$. 5

Or

Prove that $\text{Cos}x\ 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \text{Cos}^2 x - 1$

29. Find the sum of n-terms of the series 5

$5 + 11 + 19 + 29 + 41 + ...$

Or

If the p^{th}, q^{th} and r^{th} terms of a G.P. are a, b and c respectively prove that $a^{q-r}\ b^{r-p}\ c^{p-q} = 1$

30. Calculate mean, variance and standard deviation of the data. 5

Classes	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequencies	3	7	12	15	8	3	2

31. If E and F are events such that $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$ Find. 5

(i) P (E or F) (ii) P (not E and not F)

Or

A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn from the box. Find the probability.

(i) all will be blue (ii) atleast one will be green

schools.aglasem.com
Sem Earn while Learn Program. Send your papers and get p
Contact: support@aglasem.com aglasem.com