TUTY

Reg.No. | | | | | | |

COMMON FIRST REVISION TEST - 2020

STANDARD - XI

Time : 3.00 hrs | **Mathematics** | **Marks: 90**

Part - I | **20 x 1 = 20**

Answer all the questions

1. n(A) = 2 and n(B ∩ C) = 3, then n[(AxB) ∪ C)]

   a) 2^3 b) 3^2 c) 6 d) 5

2. Find the range of the function $\frac{1}{1-2\sin x}$

   a) $(-\infty, -1) \cup (1/3, \infty)$ b) (-1, 1/3) c) [-1, 1/3] d) $(-\infty, -1] \cup [1/3, \infty]$

3. The number of roots of $(x+3)^4 + (x+5)^4 = 16$ is

   a) 4 b) 2 c) 3 d) 0

4. The maximum value of $4\sin^2 x + 3\cos^2 x + \sin x/2 + \cos x/2$ is

   a) $4+\sqrt{2}$ b) $3+\sqrt{2}$ c) 9 d) 4

5. Number of sides of a polygon having 44 diagonal is

   a) 4 b) 4! c) 11 d) 22

6. 1 + 3 + 5 + 7 + ... + 17 is equal to

   a) 101 b) 81 c) 71 d) 61

7. The remainder when 38^{15} is divisible by 13

   a) 12 b) 1 c) 11 d) 5

8. The slope of the line which makes an angle 45º with the line 3x -y = -5 are

   a) 1, -1 b) 1/2, -2 c) 1, 1/2 d) 2, -1/2

9. If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is 3x + 4y = 0, then c equals to

   a) -3 b) -1 c) 3 d) 1

10. If $A = \begin{bmatrix} \lambda & 1 \\ -1 & -\lambda \end{bmatrix}$, then for what values of λ, $A^2 = 0$.

    a) 0 b) ± 1 c) -1 d) 1

11. A root of the equation $\begin{vmatrix} 3-x & -6 & 3 \\ -6 & 3-x & 3 \\ 3 & 3 & -6-x \end{vmatrix} = 0$ is

    a) 6 b) 3 c) 0 d) -6

12. If $\vec{BA} = 3\hat{i} + 2\hat{j} + \hat{k}$ and the positions vector of B is $\hat{i} + 3\hat{j} - \hat{k}$, the position vector of A is

    a) $4\hat{i} + 2\hat{j} + \hat{k}$ b) $4\hat{i} + 5\hat{j}$ c) $4\hat{i}$ d) $-4\hat{i}$

Common Exam

13 If $\vec{a} = \hat{i} + \hat{j} - \hat{k}$, $\vec{b} = 2\hat{i} + x\hat{j} + \hat{k}$, $\vec{c} = \hat{i} - \hat{j} + 4\hat{k}$ and $\vec{a} \cdot (\vec{b} \times \vec{c}) = 70$ then x is equal to

a) 5 b) 7 c) 26 d) 10

14 $\lim_{x \to 0} \frac{a^x - b^x}{x} = 1$

a) logab b) log a/b c) log (b/a) d) a/b

15 The function f(x) = $\begin{cases} \frac{x^2 - 1}{x^3 + 1}, & x = -1 \\ P, & x \neq -1 \end{cases}$ is not defined for x = -1. The value of f(-1) so that the function extended by this value is continuous is

a) 2/3 b) -2/3 c) 1 d) 0

16 If y = mx + c and f(0) = f' (0) = 1, then f(2) is

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

17 The derivative of f(x) = x |x| at x = -3 is

a) 6 b) -6 c) doesnot exist d) 0

18 $\int \frac{\sqrt{\tan x}}{\sin 2x} dx =$

a) $\sqrt{\tan x} + c$ b) $2\sqrt{\tan x} + c$ c) $\frac{1}{2}\sqrt{\tan x} + c$ d) $\frac{1}{4}\sqrt{\tan x} + c$

19. $\int \frac{dx}{e^x - 1} =$

a) log $|e^x|$ - log $|e^x - 1|$ + c b) log $|e^x|$ + log $|e^x - 1|$ + c

c) log $|e^x - 1|$ - log $|e^x|$ + c d) log $|e^x + 1|$ - log $|e^x|$ + c

20 If a events A, B are independent such that P(A) = 0.35, P(AUB) = 0.6 then P(B) is

a) 5/13 b) 1/13 c) 4/13 d) 7/13

Part - B

II. Answer any 7 questions. Question No. 30 is compulsory. **7 x 2 = 14**

21 Find the domain of f(x) = $\frac{1}{1 - 2\cos x}$

22 Solve $2|x+1| - 6 \leq 7$ and graph the solution set in a number line.

23 If $nC_{12} = nC_9$, find $21C_n$

24 Find the coefficient of x^6 in $(3+2x)^{10}$

25 Determine a if A = $\begin{bmatrix} 7 & 3 \\ -2 & a \end{bmatrix}$ is a singular matrix.

26. For unit vector $\vec{a}, \vec{b}, \vec{c}$, $\vec{a}.\vec{b} = \vec{a}.\vec{c} = 0$ and angle between $\vec{b}$ and $\vec{c}$ is $\pi/3$ then prove that $\vec{a} = \pm \frac{2}{\sqrt{3}}(\vec{b} \times \vec{c})$

27. Find $\lim_{x \to x} \frac{1-x^3}{3x+2}$

28. Evaluate $\int \sqrt{(15-2x)}\, dx$

29. The odds that the event A occurs is 5 to 7, find P(A).

30. Find the length of an arc of the circle of radius 5cm subtending a central angle measuring 15°.

Part - C

III. Answer any seven questions. Question No.40 is compulsory **7 x 3 = 21**

31. If $f: R \to R$ is defined by $f(x) = 3x - 5$, prove that f is a bijection and find its inverse.

32. Find a quadratic polynomial f(x) such that $f(0) = 1$, $f(-2) = 0$ and $f(1) = 0$.

33. If $A + B = 45°$ then prove that $(1+\tan A)(1+\tan B) = 2$.

34. If a, b, c in G.P. and $a^{1/x} = b^{1/y} = c^{1/z}$ then prove that x, y, z are in A.P.

35. Find the distance from a point (2, 4) to a straight line $4x + 3y + 4 = 0$

36. Express $\begin{pmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{pmatrix}$ as a sum of symmetric and skew-segmetric matrices.

37. If $y = 1/x$ find y'''.

38. If $f'(x) = 3x^2 - 4x + 5$, $f(1) = 3$ find f(x).

39. If 2 coins are tossed simultaneously, then find the probability of getting.
    i) one head and one tail ii) atmost 2 tails

40. If $(n+2)C_7 : (n-1)P_4 = 13:24$ find n.

Part - D

IV. Answer all the questions: **7 x 5 = 35**

41. a) If f, g $R \to R$ are defined by $f(x) = |x| + x$ and $g(x) = |x| - x$ find fog and gof. **(OR)**
    b) Write the steps to obtain the graph of the function $y = 3(x-1)^2 + 5$ from the graph $y = x^2$

42. a) Find the partial fraction of $\frac{x^2+x+1}{x^2-5x+6}$ **(OR)**

    b) Prove that $\log 2 + 16\log\frac{16}{15} + 12\log\frac{25}{24} + 7\log\frac{81}{80} = 1$.

43. a) If $\sec\theta + \tan\theta = P$, find $\sec\theta$, $\tan\theta$, $\sin\theta$. **(OR)**

b) Prove $1^2 + 2^2+3^2 + ...+n^2 = \frac{n(n+1)(2n+1)}{6}$ by mathematical induction method.

44. a) If the binomial coefficients of 3 consecutive terms in the expansion of $(a+x)^n$ are in the ratio 1:7:42, then find n. **(OR)**

b) Find the equation of the line through the intersection of the lines $3x + 2y + 5 = 0$ and $3x - 4y + 6 = 0$ and the point (1, 1)

45. a) Prove that $\begin{vmatrix} 1 & x^2 & x^3 \\ 1 & y^2 & y^3 \\ 1 & z^2 & z^3 \end{vmatrix} = (x - y)(y - z)(z - x)(xy + yz + 2x$ **(OR)**

b) Find the value of $\frac{\sqrt{x-1}-2}{x-5}$

46. a) Show that $4\hat{i}+5\hat{j}+\hat{k}, -\hat{j}-\hat{k}, 3\hat{i}+9\hat{j}+4\hat{k}, -4\hat{i}+4\hat{j}+4\hat{k}$ are coplanar. **(OR)**

b) If $y = e^{\tan^{-1}x}$ then prove that $(1+x^2)y'' + (2x-1)y' = 0$

47. a) Find $\int \frac{1}{x^2-2x+5} dx$ **(OR)**

b) In a factory machine I produces 40% of items and machine II produces 60% of terms 4% of items by machine I and 5% of items by machine II are defective. Find the probability that the defective items produced by machine II.

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