

Paper: MathsTotal Marks: 20Month Test: February

Obt. Marks: \_\_\_\_\_

Theme/Unit: 1, 2, 3, 5, 7, 9, 10, 11Grand Total: 100

Objective: \_\_\_\_\_

Signature: \_\_\_\_\_

Time: \_\_\_\_\_

Roll No: \_\_\_\_\_

class: 1<sup>st</sup> year

Section: \_\_\_\_\_

**Q. No. 1: Encircle the correct option:****/20**1. Resolution of  $\frac{x^2+6}{(x+2)(x+3)}$  into partial fraction is the form of:

a.  $\frac{A}{x+2} + \frac{B}{x+3}$

c.  $\frac{Ax+B}{x+2} + \frac{c}{x+3}$

b.  $\frac{A}{x+2} + \frac{Bx+c}{x+3}$

d.  $1 + \frac{A}{x+2} + \frac{B}{x+3}$

2. Range of  $\sin^{-1}x$  is:

a.  $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

c.  $-\frac{\pi}{2} < x < \frac{\pi}{2}$

b.  $0 \leq x \leq \pi$

d.  $0 < x < \pi$

3. The angle which have the same initial and terminal sides are called:

a. Acute

c. Right

b. Astute

d. Coterminal

4. A die is thrown once then probability to get an odd number is:

a.  $\frac{1}{2}$

d.  $\frac{2}{3}$

b.  $\frac{1}{6}$

c.  $\frac{5}{6}$

5. No of words that can be formed from the letter of the word PLANE using all letters at a time is equal to:

a. 5

c. 5!

b. 4!

d. 4

6. If  $\begin{vmatrix} 4 & 0 & 0 \\ 2 & x+7 & 0 \\ 1 & 6 & 12 \end{vmatrix} = 0$  then x equals to:

a. -7

c. 48

b. 7

d. 6

7. The way of drawing conclusion from limited no of observations is called:

a. Deduction

c. Disjunction

b. Conjunction

d. Induction

8.  $\forall z \in C, z + \bar{z}$  is:

a. Complex number

c. Real number

b. Rational number

d. Irrational number

9.  $\forall a, b \in R \Rightarrow ab \in R$  is called:

a. Closure law

c. Associative law

b. Commutative law

d. Distributive law

10.  $A = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$  and  $B = [5 \ 0]$  then AB is:

a.  $\begin{bmatrix} 10 & 0 \\ -5 & 0 \end{bmatrix}$

b.  $\begin{bmatrix} 10 \\ 0 \end{bmatrix}$

- c. [10 0] d.  $\begin{bmatrix} 10 \\ -5 \end{bmatrix}$
11. If  $A=\{0\}$  then  $P(A)$  is:  
 a.  $\{0\}$  c.  $\{\Phi, \{0\}\}$   
 b.  $\{0, \Phi\}$  d.  $\{\{0\}, \{\Phi\}\}$
12. The set  $\{0, 1\}$  is closed under:  
 a. Addition c. Subtraction  
 b. Multiplication d. Division
13. If  $n$  is a prime no. then  $\sqrt{n}$  is:  
 a. Prime no. c. Natural no.  
 b. Rational no. d. Irrational no.
14. In order  $A$  is  $m \times n$  and  $k$  is any scalar then order of  $KA$  is:  
 a.  $m \times n$  c.  $kn \times km$   
 b.  $km \times kn$  d.  $n \times m$
15.  $0!$  is equal to:  
 a. 3 c. 1  
 b. 2 d. 0
16. If each entry of one row or column in a square matrix  $A$  is 0 then:  
 a.  $|A| \neq 0$  c.  $|A| = 1$   
 b.  $|A| = 0$  d.  $|A| = -1$
17. If  $E$  is an event then:  
 a.  $-1 \leq P(E) \leq 1$  c.  $-1 \leq P(E) \leq 0$   
 b.  $0 \leq P(E) \leq 1$  d.  $0 < P(E) < 1$
18. If  $\sec\theta < 0$  and  $\sin\theta < 0$ , then the terminal arm of an angle lies in:  
 a. 1<sup>st</sup> quadrant c. 3<sup>rd</sup> quadrant  
 b. 2<sup>nd</sup> quadrant d. 4<sup>th</sup> quadrant
19.  $\operatorname{Cosec}(\pi + \theta)$  equals to  
 a.  $-\sec\theta$  c.  $\operatorname{Cosec}\theta$   
 b.  $\sec\theta$  d.  $-\operatorname{cosec}\theta$
20. Range of  $\sin x$  is:  
 a.  $[-3, 3]$  d.  $[-1, 1]$

Paper: MathsTotal Marks: 80Month Test: February

Obt. Marks: \_\_\_\_\_

Theme/Unit: Firsh halfGrand Total: 100

Subjective: \_\_\_\_\_

Signature: \_\_\_\_\_

Time: \_\_\_\_\_

Roll No: \_\_\_\_\_

class: 11th

Section: \_\_\_\_\_

b.  $[-2, 2]$ c.  $[-1, 0]$ **Part – I****Q. No. 1: Write Short answers:****/18**1) Does the set  $\{1, -1\}$  possess closure property w.r.t Multiplication?

- 2) Factorize  $3x^2 + 3y^2$
- 3) Write power set of  $A = \{9, 11\}$
- 4) Write converse and contrapositive of  $q \rightarrow p$
- 5) Define function
- 6) In group  $(z, +)$  write inverse of 2 and -3.
- 7) If  $A = \begin{bmatrix} i & 0 \\ 1 & -i \end{bmatrix}$ , show that  $A^4 = I_2$
- 8) Show that  $\begin{vmatrix} 2 & 3 & -1 \\ 1 & 1 & 0 \\ 2 & -3 & 5 \end{vmatrix} = 0$
- 9) Show  $\begin{bmatrix} 0 & -4 & 1 \\ 4 & 0 & -3 \\ -1 & 3 & 0 \end{bmatrix}$  is skew matrix.

**Q. No. 2: Short answers:****/16**

- 1) Resolve the fraction  $\frac{1}{x^2-1}$  into partial fraction.
- 2) Define proper rational fraction.
- 3) Convert into proper fraction  $\frac{3x^2-1}{x-2}$
- 4) Evaluate:  $\frac{9!}{2!(9-2)!}$
- 5) Convert in factorial form  $n(n-1)(n-2) \dots (n-r+1)$
- 6) Find the value of  $n$ ,  ${}^n P_4 : {}^{n-1} P_3 = 9: 1$
- 7) In how many ways can 4 keys be arranged on a circular key ring?
- 8) Prove that  ${}^n C_r = {}^n C_{n-r}$

**Q. No. 3: Write Short Answers:****/16**

- 1) Convert  $54^\circ 45'$  into radian.
- 2) Verify  $2\sin 45^\circ + \frac{1}{2} \operatorname{cosec} 45^\circ = \frac{3}{\sqrt{2}}$
- 3) Find 'x' if  $\tan^2 45^\circ - \cos^2 60^\circ = x \sin 45^\circ \cos 45^\circ \tan 60^\circ$
- 4) Find the value of  $\tan(1110^\circ)$
- 5) Prove that  $\tan(45^\circ + A)\tan(45^\circ - A) = 1$
- 6) Express product as sums or difference  $\cos(2x+30^\circ)\cos(2x-30^\circ)$
- 7) Find the period of  $\cos \frac{x}{6}$
- 8) Find the period of  $\tan 4x$

### Part – II

**Q. 4: (a).** If, A, B, C are any Non-empty three sets then show that:

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

**(b).** Find the rank of matrix:  $\begin{bmatrix} 1 & -4 & -7 \\ 2 & -5 & 1 \\ 1 & -2 & 3 \\ 3 & -7 & 4 \end{bmatrix}$

**Q. 5: (a).** Resolve the given into partial fraction:  $\frac{2x+1}{(x-1)(x+2)(x+3)}$

**(b).** Prove that  ${}^n C_r + {}^n C_{r-1} = {}^{n+1} C_r$

**Q. 6: (a).** Prove that  $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$

**(b).** if  $\alpha + \beta + \gamma = 180$  show that:

$$\cot \alpha \cot \beta + \cot \beta \cot \gamma + \cot \gamma \cot \alpha = 1$$