

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION,

MULTAN

OBJECTIVE KEY FOR INTER (PART I) Annual Examination, 2016.

Name of Subject Mathematics

Session 2016

Group: 1st

Group: 2nd

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	6191	6193	6195	6197
1.	E	B	D	B
2.	C	D	C	A
3.	A	A	C	D
4.	C	B	C	A
5.	A	C	C	B
6.	D	B	B	B
7.	C	A	D	C
8.	C	D	A	A
9.	C	A	B	C
10.	C	B	C	A
11.	B	B	B	D
12.	D	C	A	C
13.	A	A	D	C
14.	B	C	A	C
15.	C	A	B	C
16.	B	D	B	B
17.	A	C	C	D
18.	D	C	A	A
19.	A	C	C	B
20.	B	C	A	C

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	6192	6194	6196	6198
1.	D	D	A	B
2.	B	C	B	D
3.	C	A	D	A
4.	A/D	B	A	C
5.	C	D	C	B
6.	B	D	D	A
7.	D	B	C	B
8.	A	C	A	D
9.	C	A/D	B	A
10.	B	C	D	C
11.	A	B	D	D
12.	B	D	B	C
13.	D	A	C	A
14.	A	C	A/D	B
15.	C	B	C	D
16.	D	A	B	D
17.	C	B	D	B
18.	A	D	A	C
19.	B	A	C	A/D
20.	D	C	B	C

سرٹیفیکیٹ بابت تصحیح سوالیہ پرچہ/مارکنگ Key

ہم نے مشورہ ریاضی پرچہ گریڈ I/II نیم New ایڈیشن 2016 کے مطابق تصحیح اسروٹس (Subjective & Objective) کو نظر ثانی چیک کر لیا ہے یہ پرچہ سلیبس کے تین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ کی قسم کی کوئی تبدیلی نہیں ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کر لیا ہے یہ Version آپس میں مطابقت رکھتے ہیں اور آئین (Syllabus) کے مطابق بھی ہیں۔ نیز اس پرچہ کی Key کی بابت بھی تصدیق کی جاتی ہے کہ یہ بھی درست معلوم ہوئی ہے۔ اس میں بھی کسی قسم کی کوئی تبدیلی نہیں ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق دفتر کی جانب سے تیار کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کر لیا ہے اور ان کی بروقتی میں Key بنائی ہے۔

PREPARED & CHECKED BY

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Q: No 2

(i) Simplify $\frac{2}{\sqrt{5}+\sqrt{8}} = \frac{2}{\sqrt{5}+\sqrt{8}} \times \frac{\sqrt{5}-\sqrt{8}}{\sqrt{5}-\sqrt{8}} \quad (1M)$

$$= \frac{2(\sqrt{5}-\sqrt{8})}{5+8} =$$

$$= \frac{2\sqrt{5}}{13} + \left(-\frac{2\sqrt{8}}{13}\right)i \quad (1M)$$

(ii) write $\{x | x \in \mathbb{N} \wedge 4 < x < 12\}$

Descriptive = set of natural nos bet. 4 and 12 (1M)

Tabular = $\{5, 6, 7, \dots, 11\}$ (1M)

(iii) Factorize $a^2 + 4b^2 = (a)^2 - (2b)^2 \cdot 2 \quad (1M)$

$$= (a)^2 - (2bi)^2 \quad (1M)$$

$$= (a - 2bi)(a + 2bi) \quad (1M)$$

(iv) Define Group.

Ans: If G is non-empty set, holds the properties

- (i) G is closed under $(*)$
 - (ii) the Operation is Associative $(*)$
 - (iii) G has an Identity element $*$
 - (iv) G has an Inverse under $*$
- (1M) (1M) (1M)

⑤ Reflexive property: $\forall a \in \mathbb{R}, a = a \quad (1+1) (2M)$

(vi) Construct $P \wedge Q$, Truth Table

P	Q	$P \wedge Q$
T	T	T
T	F	F
F	T	F
F	F	F

(vii) Discuss the nature $x^2 + 2x + 3 = 0$ 1+1=(2M)

$D = b^2 - 4ac$
 $= 4 - 12 \quad (1M)$

$D = -8 < 0$

$\therefore$ Roots are complex/imaginary (1M)

(viii) $x(x+1) = 132 \quad (1M)$

Reqd. sol $= \{ \quad \} \quad (1M)$

(ix) write any two correct properties 1+1=(2M)

Sum: 10
 Correct: 10
 Date:

Q. NO 2

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(x) write in $AX=B \Rightarrow X=A^{-1}B$ (1M)

Find $X = \begin{bmatrix} -89 & -19 \\ 29 & 52 \\ 9 & 9 \end{bmatrix}$ (1M)

(xi) $P(-2) = -4$ (1M) Finding $K = -4$ (1M)

(xii) write $(AB)^t = B^t A^t$ (1M)

Reqd. result. = AB is symmetric (1M)

Q. NO 3: Resolve: $\frac{1}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1}$ (1M)

Finding the values of $\frac{1}{2(x-1)} - \frac{1}{2(x+1)}$ (1M)

(ii) write: $a_1 = \frac{1}{3}$ (1M), $a_2 = \frac{2}{5}$, $a_3 = \frac{3}{7}$ (1M)

(iii) A.M = $\frac{3\sqrt{5} + 5\sqrt{5}}{2}$ (1M), A.M = $4\sqrt{5}$ (1M)

(iv) writing $a_{12} = (1+i)(1+i)^{11}$ (1M) Result = -64 (1M)

(v) In A.P. 3, 5, 7, (1M), $a_9 = 3 + 16 = 19$, In H.P. = $\frac{1}{19}$ (1M)

(vi) $\frac{(n+1)(n)(n-1) \times (n-2)!}{3 \cdot 2 \cdot 1 (n-2)!}$ (1M), Result = $\frac{(n+1)!}{3! (n-2)!}$ (1M)

(vii) writing $nC_5 = nC_{n-5}$ (1M), Result = $n = 9$ (1M)

(viii) $nPr = n \cdot \frac{(n-1)!}{(n-r)!}$ (1M), Result: $\frac{n!}{(n-r)!}$ (1M)

(ix) $(1+2x)^{-1} = 1 + (-1)(2x) + \frac{-1 \cdot (-1-1)}{2!} (2x)^2 + \dots$ (1M)
 $= 1 - 2x + 4x^2 + \dots$ (1M)

(x) $\sqrt{99} = (100-1)^{1/2} = 10(1-0.01)^{1/2}$ (1M) Result = — (1M)

(xi) Expanding = (1M), Result = 724 (1M)

(xii) Correct Definition, (2 m)

General Instructions
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Q: NO 34

(i) $r = \frac{2}{9}$ (1M), Result = $r = 10\text{cm}$ (1M)

(ii) $(\frac{1}{2})^2 + (\frac{\sqrt{3}}{2})^2 + (1)^2$ (1M), Result = 2 (1M)

(iii) writing: $\frac{1 - \frac{\sin^2 \theta}{\cos^2 \theta}}{1 + \frac{\sin^2 \theta}{\cos^2 \theta}} = (1M)$, Result = $\cos^2 \theta - \sin^2 \theta$ (1M)

(iv) $\alpha + \beta + \gamma = 180^\circ \Rightarrow \alpha + \beta = 180^\circ - \gamma$ (1M), Result: (1M)

(v) $\cos(\alpha)\cos 45^\circ - \sin \alpha \sin 45^\circ$ (1M), Result: (1M)

(vi) Express, $\frac{1}{2}(2 \sin \theta \cos 2\theta)$ (1M), Result: (1M)

(vii) write $\cot 8x = \cot(8x + \pi)$ (1M), $P = \frac{\pi}{8}$ (1M)

(viii) $\beta = 52^\circ 40'$, $c = 400$ (1M), $b = 318$ (1M)

(ix) writing $R = \frac{a}{2 \sin \alpha}$ (1M), Result: (1M)

(x) R.H.S = $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ (1M), Result: (1M)

(xi) writing, Formula or any other method (1+1=2M)

(xii) θ lies in III & IV in quad, $x = \{\frac{4\pi}{3}, \frac{5\pi}{3}\}$ in $[0, 2\pi]$ 1+1=2M

(xiii) $\tan \theta = \pm \frac{1}{\sqrt{3}}$ and $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$; (1M) solution: $\{\frac{\pi}{6}, \frac{5\pi}{6}\}$ 1M

LONG QUESTIONS

5(a) Finding $|A| \neq 0$ (1M), $x = \frac{D_1}{|A|}$, $y = \frac{D_2}{|A|}$, $z = \frac{D_3}{|A|}$ (2+3=5M)

(b) writing $3x^2 - 2(a+b+c)x + (ab+bc+ca) = 0$ (2M),

Disc = $4(a+b+c)^2 - 12(ab+bc+ca)$
 $= 2[(a-b)^2 + (b-c)^2 + (c-a)^2]$ (2M)

Result: (1M)

6(a) writing in form of $\frac{A}{x-1} + \frac{B}{(x+1)^2} + \frac{C}{(x+1)^2} + \frac{D}{(x+1)^3}$ (1M)

Finding (A, B, C, D) (1M) each value, Result: (1M)

(b) Let terms are: $a-3d, a-d, a+d, a+3d$ in A.P (1M)

Sum = (1M), Sum of squares (2M), Result (1M)

Sum = 100
Sum of squares = 1000

SECTION - I

G.2 i, Distributive property and Simplification 2 m.

(ii) Rationalization and Simplification 2 m.

(iii) Simplification 2 m.

(iv) Distributive and tabular form 1+1 m.

v, Truth table 1 m correct answer 1 m.

vi, Definition 2 m.

(vii) Expansion 1 m Answer 1 m.

(viii) using property 1 m answer 1 m.

ix, writing Symmetric 1 m, $(A^2)^t = A^2$ 1 m.

x, Multiplication of R.H.S 2 m.

(xi) $\alpha + \beta = p$, $\alpha\beta = -p - c$ 1 m proof. 1 m.

(xii) Proving $b^2 - 4ac = (-p)^2 - 4(p+q)(q)$
 $= p^2 - 4pq + 4q^2 = (p-2q)^2$
 2 m.

Q.3 i, $\frac{7x+25}{(x+3)(x+4)} = \frac{A}{x+3} + \frac{B}{x+4}$ 1 m.

values of A and B 1 m.

(ii) 1 mark for each term.

(iii) writing $\frac{1}{b} - \frac{1}{a} = \frac{1}{c} - \frac{1}{b}$ 1 mark.

$$b = \frac{2ac}{a+c} \quad 1 m.$$

(iv) $S_{\infty} = \frac{a_1}{1-r}$ 1 m. $S_{\infty} = 1$ 1 m.

v, $S = \frac{2(2)b}{2+b}$, $b = -10$ 1+1 m.

(vi) Simplification 2 m.

General Instructions

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(vii) $s_p = 1m$ answer = 60 1m.

(viii) finding value of n 2m.

(ix) $PC(5) = 1m$ $PC(4) = \frac{2}{3} 1m$.

x, $C-1 = 1m$ $C-2 = 1m$.

(xi)

$T_6 = {}^{10}C_5 (x^2)^5 \left(-\frac{3}{2x}\right)^5$ and simplification 2m.

(xii) $\frac{1-x}{1+x} = (1-x)(1+x)^{-1/2}$ 1m.

$= (1-x)\left(1 - \frac{1}{2}x\right) = 1 - \frac{3}{2}x$ 1m.

12.4 (i) verification for 30° and 45° 1+1m.

(ii) putting values 1m simplification 1m.

(iii) correct proof 2m.

(iv) $\alpha + \beta + \gamma = 180^\circ$, proving $\tan(\alpha + \beta) + \tan \gamma = 0$ 1+1m.

(v) $\cos(\alpha + 45^\circ) = \cos \alpha \cos 45^\circ - \sin \alpha \sin 45^\circ$ 1m
 $= \frac{1}{\sqrt{2}} \cos \alpha - \frac{1}{\sqrt{2}} \sin \alpha = \frac{1}{\sqrt{2}} (\cos \alpha - \sin \alpha)$ 1m.

(vi) correct proof 2m.

(vii) $\cot(8x + \pi)$ 1m, $\cot\left(8\left(x + \frac{\pi}{8}\right)\right)$, final = $\frac{\pi}{8}$ 1m.

(viii) Definition 2m.

(ix) proof 2m.

(x) $l = \frac{A}{s}$, $s = \frac{a+b+c}{2}$ 1m, Answer 1m.

(xi) $\cos^{-1}(-x) + \cos^{-1}x = \pi$ & proving L.H.S = π 1+1m

(xii) reference angle 1m solution 1m.

(xiii) bearing from = $\frac{1}{\sqrt{3}}$ and from = $-\frac{1}{\sqrt{3}}$ 1+1m.

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General Instructions
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$$\underline{S(a)}: \begin{vmatrix} b+c & a & a^2 \\ c+a & b & b^2 \\ a+b & c & c^2 \end{vmatrix}$$

Take $(a+b+c)$ Common $\longrightarrow$ 1m

expanding and getting ans — 3m

(b): $\frac{x^2}{a^2} + \frac{(mx+c)^2}{b^2} = 1$

writing in quadratic Eqn ——— 2m

Discriminant $\frac{1}{m}$

proving $c^2 = a^2 + b^2$ 2m

6(a). writing $\frac{1}{(x+1)^2(x^2-1)}$ into partial fraction

Finding value of A, B, C, D and result

$$(b) \frac{a^n + b^n}{a^{n-1} + b^{n-1}} = \sqrt[n]{ab} \quad \text{--- } 2m$$

For value of n 3 m

$$7(a): \quad \binom{n-1}{r} + \binom{n-1}{r-1} = \frac{(n-1)!}{r!(n-r-1)!} + \frac{(n-1)!}{(r-1)!(n-r)!}$$

Simplification

(b): $n x = \frac{1}{2^2}$, $\frac{n(n-1)}{2!} x^2 = \frac{1 \cdot 3}{2!} \cdot \frac{1}{2^4}$

value of n, x

proving $y^2 + y - 1 = 0$

8(a):
$$\frac{L.H.S = \tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1}$$

Rationalizing $\longrightarrow 2m$
Simplification and result $\longrightarrow 3m$

(b):
$$\begin{aligned} L.H.S &= \cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ \\ &= \cos 20^\circ \cos 40^\circ \times \frac{1}{2} \cos 80^\circ \longrightarrow 1m \\ &= \frac{1}{4} \cos 20^\circ (2 \cos 40^\circ \cos 80^\circ) \longrightarrow 2m \\ &= \frac{1}{4} \cos 20^\circ (\cos(80^\circ + 40^\circ) + \cos(80^\circ - 40^\circ)) \\ &\text{result} \longrightarrow 2m \end{aligned}$$

9(a): formula and putting values $\longrightarrow 2m$

Simplification and ans $\longrightarrow 3m$

(b):
$$\begin{aligned} L.H.S &= \tan^{-1} \frac{3}{4} + \tan^{-1} \frac{3}{5} - \tan^{-1} \frac{8}{19} \\ &= \tan^{-1} \left(\frac{\frac{3}{4} + \frac{3}{5}}{1 - \frac{3}{4}(\frac{3}{5})} \right) - \tan^{-1} \frac{8}{19} \longrightarrow 2m \\ &= \tan^{-1} \frac{27}{11} - \tan^{-1} \frac{8}{19} \\ &= \tan^{-1} \frac{27}{11} - \frac{8}{19} \longrightarrow 2m \\ &\quad \frac{1 - (\frac{27}{11})(\frac{8}{19})} \end{aligned}$$

ans $\longrightarrow 1m$

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INTERMEDIATE PART-I (11th CLASS)**MATHEMATICS PAPER-I GROUP-I**

TIME ALLOWED: 2.30 Hours

SUBJECTIVE

MAXIMUM MARKS: 80

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts.

8 × 2 = 16

- (i) Simplify $\frac{2}{\sqrt{5} + \sqrt{-8}}$ by expressing in the form $a + bi$
- (ii) Write $\{x \mid x \in N \wedge 4 < x < 12\}$ in descriptive and tabular form.
- (iii) Factorize $a^2 + 4b^2$
- (iv) Define Group.
- (v) Write Reflexive Property of Equality of Real Numbers.
- (vi) Construct the truth table of $p \wedge q$ of two statements p and q .
- (vii) Discuss the nature of the roots of equation $x^2 + 2x + 3 = 0$
- (viii) Find two consecutive numbers whose product is 132.
- (ix) Write any two properties of determinants of square matrices.
- (x) Find the matrix X if $\begin{bmatrix} 5 & 2 \\ -2 & 1 \end{bmatrix} X = \begin{bmatrix} 2 & 1 \\ 5 & 10 \end{bmatrix}$
- (xi) Find the value of k if the polynomial $x^3 + kx^2 - 7x + 6$ has a remainder of -4 when divided by $(x + 2)$.
- (xii) If the matrices A and B are symmetric and $AB = BA$, show that AB is symmetric.

3. Attempt any eight parts.

8 × 2 = 16

- (i) Resolve into partial fractions $\frac{1}{x^2 - 1}$
- (ii) Write the 1st three terms of the sequence if $an = \frac{n}{2n + 1}$
- (iii) Find A.M between $3\sqrt{5}$ and $5\sqrt{5}$.
- (iv) Find the 12th term of G.P if $1 + i, 2i, -2 + 2i, \dots$
- (v) Find the 9th term of the H.P $\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \dots$
- (vi) Write in factorial form $\frac{(n+1)(n)(n-1)}{3.2.1}$
- (vii) Find the value of n when ${}^nC_5 = {}^nC_4$
- (viii) Show that ${}^nP_r = n \cdot {}^{n-1}P_{r-1}$
- (ix) Expand up to three terms $(1 + 2x)^{-1}$
- (x) Using Binomial theorem find the value up to three place of decimals of $\sqrt{99}$
- (xi) Expand and simplify $(2 + \sqrt{3})^5 + (2 - \sqrt{3})^5$
- (xii) Define Mutually Exclusive Events.

4. Attempt any nine parts.

- (i) Find r , when $\ell = 5\text{cm}$, $\theta = \frac{1}{2}$ radian.
- (ii) Prove that $\sin^2 \frac{\pi}{6} + \sin^2 \frac{\pi}{3} + \tan^2 \frac{\pi}{4} = 2$
- (iii) Prove $\cos^2 \theta - \sin^2 \theta = \frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$
- (iv) If α, β, γ are the angles of a triangle ABC , then prove that $\cos(\alpha + \beta) = -\cos \gamma$
- (v) Prove that $\cos(\alpha + 45^\circ) = \frac{1}{\sqrt{2}}(\cos \alpha - \sin \alpha)$
- (vi) Express $\sin 5\theta \cos 2\theta$ as sum or difference.
- (vii) Find the period of $\cot 8x$.
- (viii) Solve the right triangle, in which $\gamma = 90^\circ$, $\alpha = 37^\circ 20'$, $a = 243$
- (ix) With usual notations, prove that $R = \frac{abc}{4\Delta}$
- (x) Show that $r_1 = S \cdot \tan \frac{\alpha}{2}$
- (xi) Without using calculator, show that $\cos^{-1} \frac{12}{13} = \sin^{-1} \frac{5}{13}$
- (xii) Find the solutions of $\sin x = -\frac{\sqrt{3}}{2}$ in $[0, 2\pi]$
- (xiii) Find the solutions of $\tan^2 \theta = \frac{1}{3}$ in $[0, \pi]$

SECTION-II**NOTE: - Attempt any three questions.**

3 × 10 = 30

- 5.(a) Solve the following systems of linear equations by Cramer's rule:-

5

$$2x + 2y + z = 3, \quad 3x - 2y - 2z = 1, \quad 5x + y - 3z = 2$$

- (b) Show that the roots of the following equation:-

5

$$(x - a)(x - b) + (x - b)(x - c) + (x - c)(x - a) = 0 \text{ are real.}$$

- 6.(a) Resolve
- $\frac{4x^3}{(x^2 - 1)(x + 1)^2}$
- into Partial Fractions.

5

- (b) Find four terms of A.P whose sum is 32 and sum of whose squares is 276.

5

- 7.(a) In how many ways can be letters of the word MISSISSIPPI be arranged when all the letters are to be used?

5

- (b) If
- x
- is very nearly equal to 1, then prove that
- $px^p - qx^q \approx (p - q)x^{p+q}$

5

- 8.(a) Prove that
- $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \tan \theta + \sec \theta$

5

- (b) Prove that
- $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$

5

- 9.(a) Prove that
- $\frac{1}{r^2} + \frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} = \frac{a^2 + b^2 + c^2}{\Delta^2}$

5

- (b) Prove that
- $\sin^{-1} \frac{3}{5} + \sin^{-1} \frac{8}{17} = \sin^{-1} \frac{77}{85}$

5

MATHEMATICS PAPER-I GROUP-I

TIME ALLOWED: 30 Minutes

OBJECTIVE

MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) The modulus of $1 - i\sqrt{3}$ is equal to:- (A) -2 (B) 2 (C) $-\sqrt{2}$ (D) $\sqrt{10}$
- (2) Tabular form of a set $\{x | x \in Q \wedge x^2 = 2\}$ is equal to:-
(A) $\{\sqrt{2}, -\sqrt{2}\}$ (B) $\{4\}$ (C) $\{\}$ (D) $\{2, -2\}$
- (3) If $A = \begin{bmatrix} a & b & c \\ d & e & f \\ a & b & c \end{bmatrix}$, then $\det A$ is equal to:- (A) 0 (B) 1 (C) $(a-b)(c-a)$ (D) $a^2 - ab + ac + b^2$
- (4) The cofactor of an element a_{ij} denoted by A_{ij} is equal to:-
(A) $(-1)^{i-j} M_{ij}$ (B) $(-1)^{i+j} M_{i+j}$ (C) $(-1)^{i+j} M_{ij}$ (D) $(1)^{i+j} M_{ij}$
- (5) A quadratic equation $ax^2 + bx + c = 0$, becomes liner equation if:-
(A) $a = 0$ (B) $b = 0$ (C) $c = 0$ (D) $a = b$
- (6) Complex cube roots of -1 are:- (A) w, w^2 (B) $1, w, w^2$ (C) $-1, -w, -w^2$ (D) $-w, -w^2$
- (7) Partial fractions of $\frac{x^2 + 1}{x^3 + 1}$ is equal to:-
(A) $\frac{A}{x+1} + \frac{B}{x^2+1}$ (B) $\frac{A}{x+1} + \frac{Bx+C}{x^2+x+1}$ (C) $\frac{A}{x+1} + \frac{Bx+C}{x^2-x+1}$ (D) $\frac{A}{x+1} + \frac{B+C}{x^2-x+1}$
- (8) If a, G, b be the G.P. where a, b are numbers then G.M. is equal to:-
(A) $\sqrt{ab}$ (B) $-\sqrt{ab}$ (C) $\pm\sqrt{ab}$ (D) ab
- (9) Reciprocal term of A.P. is:- (A) A.P. (B) G.P. (C) H.P. (D) None of these
- (10) If S is a sample space and $E = S$ is an event then $P(E)$ is equal to:-
(A) $[0, 1]$ (B) 0 (C) 1 (D) $(0, 2)$
- (11) If ${}^nC_r = {}^nC_q$, which of the following must be true?
(A) $r \neq q$ (B) $r + q = n$ (C) $r - q = n$ (D) $q = 0$
- (12) $1 + 2x + 3x^2 + 4x^3 + \dots + \infty$ is the expansion of:-
(A) $(1+x)^{-2}$ (B) $(1+x)^2$ (C) $(1-x)^2$ (D) $(1-x)^{-2}$
- (13) Sum of exponent of a and b in $(a+b)^n$ in every term is:-
(A) n (B) $2n$ (C) $\frac{n}{2}$ (D) $n+1$
- (14) The 60th part of 1 - degree is called one:-
(A) Second (B) Minute (C) Degree (D) Radian
- (15) $\frac{2 \tan \theta}{1 + \tan^2 \theta}$ is equal to:- (A) $\tan 2\theta$ (B) $\cot 2\theta$ (C) $\sin 2\theta$ (D) $\cos 2\theta$
- (16) Range of $\tan x$ is equal to:- (A) Q (B) IR (C) Z (D) N
- (17) If ABC be any triangle and $\gamma = 90^\circ$, then:-
(A) $a^2 + b^2 = c^2$ (B) $a^2 + c^2 = b^2$ (C) $b^2 + c^2 = a^2$ (D) $a^2 + b^2 + c^2 = 0$
- (18) Angle below the horizontal line is called:-
(A) Right angle (B) Oblique angle (C) Angle of Elevation (D) Angle of Depression
- (19) $\cos(\tan^{-1} \sqrt{3})$ is equal to:- (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) $\frac{\sqrt{3}}{2}$ (D) $-\frac{\sqrt{3}}{2}$
- (20) If $\cos x + 1 = 0$, then:-
(A) $\{\pi/2 + 2n\pi\}$ (B) $\{\pi + 2n\pi\}$ (C) $\{\pi + n\pi\}$ (D) $\{-\pi/2 + 2n\pi\}$

MATHEMATICS PAPER-I GROUP-I

TIME ALLOWED: 30 Minutes

OBJECTIVE

MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) If ${}^nC_r = {}^nC_q$, which of the following must be true?
 (A) $r \neq q$ (B) $r + q = n$ (C) $r - q = n$ (D) $q = 0$
- (2) $1 + 2x + 3x^2 + 4x^3 + \dots + \infty$ is the expansion of:-
 (A) $(1+x)^{-2}$ (B) $(1+x)^2$ (C) $(1-x)^2$ (D) $(1-x)^{-2}$
- (3) Sum of exponent of a and b in $(a+b)^n$ in every term is:-
 (A) n (B) $2n$ (C) $\frac{n}{2}$ (D) $n+1$
- (4) The 60th part of 1 - degree is called one:-
 (A) Second (B) Minute (C) Degree (D) Radian
- (5) $\frac{2 \tan \theta}{1 + \tan^2 \theta}$ is equal to:- (A) $\tan 2\theta$ (B) $\cot 2\theta$ (C) $\sin 2\theta$ (D) $\cos 2\theta$
- (6) Range of $\tan x$ is equal to:- (A) $\mathbb{Q}$ (B) $\mathbb{R}$ (C) $\mathbb{Z}$ (D) $\mathbb{N}$
- (7) If ABC be any triangle and $\gamma = 90^\circ$, then:-
 (A) $a^2 + b^2 = c^2$ (B) $a^2 + c^2 = b^2$ (C) $b^2 + c^2 = a^2$ (D) $a^2 + b^2 + c^2 = 0$
- (8) Angle below the horizontal line is called:-
 (A) Right angle (B) Oblique angle (C) Angle of Elevation (D) Angle of Depression
- (9) $\cos(\tan^{-1} \sqrt{3})$ is equal to:- (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) $\frac{\sqrt{3}}{2}$ (D) $-\frac{\sqrt{3}}{2}$
- (10) If $\cos x + 1 = 0$, then:-
 (A) $\{\pi/2 + 2n\pi\}$ (B) $\{\pi + 2n\pi\}$ (C) $\{\pi + n\pi\}$ (D) $\{-\pi/2 + 2n\pi\}$
- (11) The modulus of $1 - i\sqrt{3}$ is equal to:- (A) -2 (B) 2 (C) $-\sqrt{2}$ (D) $\sqrt{10}$
- (12) Tabular form of a set $\{x \mid x \in \mathbb{Q} \wedge x^2 = 2\}$ is equal to:-
 (A) $\{\sqrt{2}, -\sqrt{2}\}$ (B) $\{4\}$ (C) $\{\}$ (D) $\{2, -2\}$
- (13) If $A = \begin{bmatrix} a & b & c \\ d & e & f \\ a & b & c \end{bmatrix}$, then $\det A$ is equal to:- (A) 0 (B) 1 (C) $(a-b)(c-a)$ (D) $a^2 - ab + ac + b^2$
- (14) The cofactor of an element a_{ij} denoted by A_{ij} is equal to:-
 (A) $(-1)^{i-j} M_{ij}$ (B) $(-1)^{i+j} M_{i+j}$ (C) $(-1)^{i+j} M_{ij}$ (D) $(1)^{i+j} M_{ij}$
- (15) A quadratic equation $ax^2 + bx + c = 0$, becomes liner equation if:-
 (A) $a = 0$ (B) $b = 0$ (C) $c = 0$ (D) $a = b$
- (16) Complex cube roots of -1 are:- (A) w, w^2 (B) $1, w, w^2$ (C) $-1, -w, -w^2$ (D) $-w, -w^2$
- (17) Partial fractions of $\frac{x^2 + 1}{x^3 + 1}$ is equal to:-
 (A) $\frac{A}{x+1} + \frac{B}{x^2+1}$ (B) $\frac{A}{x+1} + \frac{Bx+C}{x^2+x+1}$ (C) $\frac{A}{x+1} + \frac{Bx+C}{x^2-x+1}$ (D) $\frac{A}{x+1} + \frac{B+C}{x^2-x+1}$
- (18) If a, G, b be the G.P. where a, b are numbers then G.M. is equal to:-
 (A) $\sqrt{ab}$ (B) $-\sqrt{ab}$ (C) $\pm\sqrt{ab}$ (D) ab
- (19) Reciprocal term of A.P. is:- (A) A.P. (B) G.P. (C) H.P. (D) None of these
- (20) If S is a sample space and $E = S$ is an event then $P(E)$ is equal to:-
 (A) $[0, 1]$ (B) 0 (C) 1 (D) $(0, 2)$

MATHEMATICS PAPER-I GROUP-I

TIME ALLOWED: 30 Minutes

OBJECTIVE

MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) Complex cube roots of -1 are:- (A) w, w^2 (B) $1, w, w^2$ (C) $-1, -w, -w^2$ (D) $-w, -w^2$
- (2) Partial fractions of $\frac{x^2 + 1}{x^3 + 1}$ is equal to:-
 (A) $\frac{A}{x+1} + \frac{B}{x^2 + 1}$ (B) $\frac{A}{x+1} + \frac{Bx + C}{x^2 + x + 1}$ (C) $\frac{A}{x+1} + \frac{Bx + C}{x^2 - x + 1}$ (D) $\frac{A}{x+1} + \frac{B + C}{x^2 - x + 1}$
- (3) If a, G, b be the G.P. where a, b are numbers then G.M. is equal to:-
 (A) $\sqrt{ab}$ (B) $-\sqrt{ab}$ (C) $\pm\sqrt{ab}$ (D) ab
- (4) Reciprocal term of A.P. is:- (A) A.P. (B) G.P. (C) H.P. (D) None of these
- (5) If S is a sample space and $E = S$ is an event then $P(E)$ is equal to:-
 (A) $[0, 1]$ (B) 0 (C) 1 (D) $(0, 2)$
- (6) If ${}^nC_r = {}^nC_q$, which of the following must be true?
 (A) $r \neq q$ (B) $r + q = n$ (C) $r - q = n$ (D) $q = 0$
- (7) $1 + 2x + 3x^2 + 4x^3 + \dots + \infty$ is the expansion of:-
 (A) $(1 + x)^{-2}$ (B) $(1 + x)^2$ (C) $(1 - x)^2$ (D) $(1 - x)^{-2}$
- (8) Sum of exponent of a and b in $(a + b)^n$ in every term is:-
 (A) n (B) $2n$ (C) $\frac{n}{2}$ (D) $n + 1$
- (9) The 60th part of 1 - degree is called one:-
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- (10) $\frac{2 \tan \theta}{1 + \tan^2 \theta}$ is equal to:- (A) $\tan 2\theta$ (B) $\cot 2\theta$ (C) $\sin 2\theta$ (D) $\cos 2\theta$
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- (13) Angle below the horizontal line is called:-
 (A) Right angle (B) Oblique angle (C) Angle of Elevation (D) Angle of Depression
- (14) $\cos(\tan^{-1} \sqrt{3})$ is equal to:- (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) $\frac{\sqrt{3}}{2}$ (D) $-\frac{\sqrt{3}}{2}$
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- (16) The modulus of $1 - i\sqrt{3}$ is equal to:- (A) -2 (B) 2 (C) $-\sqrt{2}$ (D) $\sqrt{10}$
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- (19) The cofactor of an element a_{ij} denoted by A_{ij} is equal to:-
 (A) $(-1)^{i-j} M_{ij}$ (B) $(-1)^{i+j} M_{i+j}$ (C) $(-1)^{i+j} M_{ij}$ (D) $(1)^{i+j} M_{ij}$
- (20) A quadratic equation $ax^2 + bx + c = 0$, becomes liner equation if:-
 (A) $a = 0$ (B) $b = 0$ (C) $c = 0$ (D) $a = b$

MATHEMATICS PAPER-I GROUP-I

TIME ALLOWED: 30 Minutes

OBJECTIVE

MAXIMUM MARKS: 20

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Q.No.1

- (1) Range of $\tan x$ is equal to:- (A) $\mathbb{Q}$ (B) $\mathbb{R}$ (C) $\mathbb{Z}$ (D) $\mathbb{N}$
- (2) If ABC be any triangle and $\gamma = 90^\circ$, then:-
(A) $a^2 + b^2 = c^2$ (B) $a^2 + c^2 = b^2$ (C) $b^2 + c^2 = a^2$ (D) $a^2 + b^2 + c^2 = 0$
- (3) Angle below the horizontal line is called:-
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- (8) If $A = \begin{bmatrix} a & b & c \\ d & e & f \\ a & b & c \end{bmatrix}$, then $\det A$ is equal to:- (A) 0 (B) 1 (C) $(a-b)(c-a)$ (D) $a^2 - ab + ac + b^2$
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- (10) A quadratic equation $ax^2 + bx + c = 0$, becomes linear equation if:-
(A) $a = 0$ (B) $b = 0$ (C) $c = 0$ (D) $a = b$
- (11) Complex cube roots of -1 are:- (A) w, w^2 (B) $1, w, w^2$ (C) $-1, -w, -w^2$ (D) $-w, -w^2$
- (12) Partial fractions of $\frac{x^2 + 1}{x^3 + 1}$ is equal to:-
(A) $\frac{A}{x+1} + \frac{B}{x^2 + 1}$ (B) $\frac{A}{x+1} + \frac{Bx+C}{x^2 + x + 1}$ (C) $\frac{A}{x+1} + \frac{Bx+C}{x^2 - x + 1}$ (D) $\frac{A}{x+1} + \frac{B+C}{x^2 - x + 1}$
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- (14) Reciprocal term of A.P. is:- (A) A.P. (B) G.P. (C) H.P. (D) None of these
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(A) $[0, 1]$ (B) 0 (C) 1 (D) $(0, 2)$
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- (18) Sum of exponent of a and b in $(a+b)^n$ in every term is:-
(A) n (B) $2n$ (C) $\frac{n}{2}$ (D) $n+1$
- (19) The 60th part of 1-degree is called one:-
(A) Second (B) Minute (C) Degree (D) Radian
- (20) $\frac{2 \tan \theta}{1 + \tan^2 \theta}$ is equal to:- (A) $\tan 2\theta$ (B) $\cot 2\theta$ (C) $\sin 2\theta$ (D) $\cos 2\theta$

INTERMEDIATE PART-I (11th CLASS)**MATHEMATICS PAPER-I GROUP-II****TIME ALLOWED: 2.30 Hours****SUBJECTIVE****MAXIMUM MARKS: 80****NOTE: - Write same question number and its part number on answer book, as given in the question paper.****SECTION-I****2. Attempt any eight parts.****8 × 2 = 16**(i) Name the property used in $a(b - c) = ab - ac$ (ii) Separate $\frac{i}{1+i}$ into real and imaginary parts.(iii) Simplify $\left(-\frac{1}{2} + \frac{\sqrt{3}}{2}i\right)^3$ (iv) Write $\{x \mid x \in N \wedge x \leq 10\}$ in the descriptive and tabular forms.(v) Show that $(p \wedge q) \rightarrow p$ is a tautology.

(vi) Define a Group.

(vii) Find the value of λ if $A = \begin{bmatrix} 4 & \lambda & 3 \\ 7 & 3 & 6 \\ 2 & 3 & 1 \end{bmatrix}$ is singular.(viii) Without expansion verify that $\begin{vmatrix} bc & ca & ab \\ \frac{1}{a} & \frac{1}{b} & \frac{1}{c} \\ a & b & c \end{vmatrix} = 0$ (ix) If A is symmetric, show that A^2 is symmetric.(x) Prove that $(x^3 + y^3) = (x + y)(x + \omega y)(x + \omega^2 y)$ (xi) If α, β are the roots of $x^2 - px - p - c = 0$, prove that $(1 + \alpha)(1 + \beta) = 1 - c$ (xii) Show that the roots of $(p + q)x^2 - px - q = 0$ are rational.**3. Attempt any eight parts.****8 × 2 = 16**(i) Resolve $\frac{7x + 25}{(x + 3)(x + 4)}$ into Partial Fractions.

(ii) Find the next two terms of 7, 9, 12, 16, -----

(iii) If $\frac{1}{a}, \frac{1}{b}$ and $\frac{1}{c}$ are in A.P. show that $b = \frac{2ac}{a + c}$ (iv) Find the sum of infinite geometric series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ (v) If 5 is H.M. between 2 and b , find b .(vi) Evaluate $\frac{8!}{4! \cdot 2!}$

(vii) How many 3-digit numbers can be formed by using each one of the digits 2, 3, 5, 7, 9 only once?

(viii) Find the value of n , when ${}^nC_5 = {}^nC_4$

(ix) A die is rolled. What is the probability that the dots on the top are greater than 4?

(x) Prove $1 + 5 + 9 + \dots + (4n - 3) = n(2n - 1)$, for $n = 1, 2$ (xi) Find the 6th term in the expansion of $\left(x^2 - \frac{3}{2x}\right)^{10}$ (xii) If x is so small that its square and higher powers can be neglected, then show that

$$\frac{1-x}{\sqrt{1+x}} \approx 1 - \frac{3}{2}x$$

4. Attempt any nine parts.

9 × 2 = 18

- (i) Verify $\cos 2\theta = 1 - 2\sin^2 \theta$ when $\theta = 30^\circ, 45^\circ$
- (ii) Verify $\sin^2 \frac{\pi}{6} + \sin^2 \frac{\pi}{3} + \tan^2 \frac{\pi}{4} = 2$
- (iii) Prove that $\frac{2 \tan \theta}{1 + \tan^2 \theta} = 2 \sin \theta \cos \theta$
- (iv) If α, β, γ are the angles of a triangle ABC , then prove that $\tan(\alpha + \beta) + \tan \gamma = 0$
- (v) Prove that $\cos(\alpha + 45^\circ) = \frac{1}{\sqrt{2}}(\cos \alpha - \sin \alpha)$
- (vi) Prove that $\cos 2\theta = \frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$
- (vii) Find the period of $\cot 8x$
- (viii) Define in-circle.
- (ix) Prove that $r_1 = s \tan \frac{\alpha}{2}$
- (x) Find r , if measures of the sides of triangle ABC are $a = 13, b = 14, c = 15$
- (xi) Show that $\cos^{-1}(-x) = \pi - \cos^{-1}x$
- (xii) Find the solution of $\cot \theta = \frac{1}{\sqrt{3}}$ in $[0, 2\pi]$
- (xiii) Solve $\tan^2 \theta = \frac{1}{3}$ in $[0, 2\pi]$

SECTION-II

NOTE: - Attempt any three questions.

3 × 10 = 30

- 5.(a) Show that $\begin{vmatrix} b+c & a & a^2 \\ c+a & b & b^2 \\ a+b & c & c^2 \end{vmatrix} = (a+b+c)(a-b)(b-c)(c-a)$ 5
- (b) Prove that $\frac{x^2}{a^2} + \frac{(mx+c)^2}{b^2} = 1$ will have equal roots if $c^2 = a^2m^2 + b^2$, $a \neq 0, b \neq 0$ 5
- 6.(a) Resolve $\frac{1}{(x+1)^2(x^2-1)}$ into partial fractions. 5
- (b) For what value of n , $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is the positive geometric mean between a and b ? 5
- 7.(a) Prove that ${}^{n-1}C_r + {}^{n-1}C_{r-1} = {}^nC_r$ 5
- (b) If $2y = \frac{1}{2^2} + \frac{1.3}{2!} \cdot \frac{1}{(2)^4} + \frac{1.3.5}{3!} \cdot \frac{1}{2^6} + \dots$ then prove that $4y^2 + 4y - 1 = 0$ 5
- 8.(a) Prove the identity $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \tan \theta + \sec \theta$ 5
- (b) Prove that $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$ 5
- 9.(a) The sides of a triangle are $x^2 + x + 1, 2x + 1$ and $x^2 - 1$.
Prove that the greatest angle of the triangle is 120° 5
- (b) Prove that $\tan^{-1} \frac{3}{4} + \tan^{-1} \frac{3}{5} - \tan^{-1} \frac{8}{19} = \frac{\pi}{4}$ 5

MATHEMATICS PAPER-I GROUP-II

OBJECTIVE

TIME ALLOWED: 30 Minutes

MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) Modulus of $5 - 3i$ is:- (A) 4 (B) 16 (C) 34 (D) $\sqrt{34}$
- (2) Drawing conclusions from premises believed to be true is called:-
(A) Induction (B) Deduction (C) Proposition (D) Contradiction
- (3) M_{21} of $\begin{bmatrix} 1 & 3 \\ 2 & -3 \end{bmatrix}$ is:- (A) 1 (B) 2 (C) 3 (D) -3
- (4) Every Diagonal matrix is also:-
(A) Triangular Matrix (B) Scalar Matrix (C) Rectangular Matrix (D) Symmetric Matrix
- (5) $x + \frac{3}{x} = 4$ is:-
(A) Reciprocal Equation (B) Transcendental Equation (C) Quadratic Equation (D) Identity
- (6) If the roots of $ax^2 + b = 0$ are real and unequal then:-
(A) $ab > 0$ (B) $ab < 0$ (C) $ab = 0$ (D) $ab \geq 0$
- (7) Any improper rational fraction can be reduced to a mixed form by:-
(A) Addition (B) Multiplication (C) Factorization (D) Division
- (8) With usual notations, the product of n Geometric Means between a and b is:-
(A) $(G)^n$ (B) nG (C) $(A)^n$ (D) $(G)^{\frac{n}{2}}$
- (9) $1^2 + 2^2 + 3^2 + \dots + n^2 =$
(A) $\frac{n(n+1)}{2}$ (B) $\frac{n(n+1)(n+2)}{6}$ (C) $\frac{n(n+1)(2n+1)}{6}$ (D) $\frac{n^2(n+1)^2}{4}$
- (10) If A and B are independent events then probability $P(A \cap B) =$
(A) $P(A) \cap P(B)$ (B) $P(A) \cdot P(B)$ (C) $P(A) + P(B)$ (D) $P(A) + P(B) - P(A \cap B)$
- (11) $(n-1)(n-2)(n-3) \dots (n-r+1) =$
(A) $\frac{(n-1)!}{(n-r)!}$ (B) $\frac{n!}{(n-r)!}$ (C) $\frac{(n-1)!}{(n-r+2)!}$ (D) $\frac{n!}{(n-r+1)!}$
- (12) There is no integer n for which 3^n is:- (A) Odd (B) Even (C) Prime (D) Complex
- (13) Expansion of $(1-2x)^{\frac{1}{3}}$ is valid if:-
(A) $|x| < 1$ (B) $|x| < \frac{1}{3}$ (C) $|x| < 2$ (D) $|x| < \frac{1}{2}$
- (14) An angle is said to be in standard position if its vertex is at:-
(A) (0, 0) (B) (1, 1) (C) (0, 1) (D) (1, 0)
- (15) $2\cos 5\theta \sin 3\theta =$
(A) $\sin 4\theta - \sin \theta$ (B) $\sin 4\theta + \sin \theta$ (C) $\sin 8\theta - \sin 2\theta$ (D) $\cos 8\theta + \cos 2\theta$
- (16) Range of $y = \cos x$ is:- (A) R (B) $-1 \leq x \leq 1$ (C) $y \geq 1$ or $y \leq -1$ (D) $-1 \leq y \leq 1$
- (17) With usual notations area of triangle ABC is:-
(A) $\sqrt{(s-a)(s-b)(s-c)}$ (B) $\frac{b}{2\sin \beta}$ (C) $\frac{ac \sin \beta}{2}$ (D) $ab \sin \gamma$
- (18) With usual notations $\sqrt{\frac{(s-c)(s-b)}{s(s-a)}} =$ (A) $\tan \frac{\alpha}{2}$ (B) $\tan \frac{\beta}{2}$ (C) $\tan \frac{\gamma}{2}$ (D) $\cot \frac{\alpha}{2}$
- (19) $\sin^{-1}\left(-\frac{1}{2}\right) =$ (A) $\frac{\pi}{3}$ (B) $-\frac{\pi}{6}$ (C) $\frac{\pi}{4}$ (D) $-\frac{\pi}{3}$
- (20) Solutions of the equation $1 + \cos \theta = 0$ are in quadrants:-
(A) I and IV (B) II and III (C) II and IV (D) None of these

MATHEMATICS PAPER-I GROUP-II

TIME ALLOWED: 30 Minutes

OBJECTIVE

MAXIMUM MARKS: 20

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Q.No.1

- (1) Range of $y = \cos x$ is:- (A) R (B) $-1 \leq x \leq 1$ (C) $y \geq 1$ or $y \leq -1$ (D) $-1 \leq y \leq 1$
- (2) With usual notations area of triangle ABC is:-
 (A) $\sqrt{(s-a)(s-b)(s-c)}$ (B) $\frac{b}{2\sin\beta}$ (C) $\frac{ac \sin \beta}{2}$ (D) $ab \sin \gamma$
- (3) With usual notations $\sqrt{\frac{(s-c)(s-b)}{s(s-a)}} =$ (A) $\tan \frac{\alpha}{2}$ (B) $\tan \frac{\beta}{2}$ (C) $\tan \frac{\gamma}{2}$ (D) $\cot \frac{\alpha}{2}$
- (4) $\sin^{-1}\left(-\frac{1}{2}\right) =$ (A) $\frac{\pi}{3}$ (B) $-\frac{\pi}{6}$ (C) $\frac{\pi}{4}$ (D) $-\frac{\pi}{3}$
- (5) Solutions of the equation $1 + \cos \theta = 0$ are in quadrants:-
 (A) I and IV (B) II and III (C) II and IV (D) None of these
- (6) Modulus of $5 - 3i$ is:- (A) 4 (B) 16 (C) 34 (D) $\sqrt{34}$
- (7) Drawing conclusions from premises believed to be true is called:-
 (A) Induction (B) Deduction (C) Proposition (D) Contradiction
- (8) M_{21} of $\begin{bmatrix} 1 & 3 \\ 2 & -3 \end{bmatrix}$ is:- (A) 1 (B) 2 (C) 3 (D) -3
- (9) Every Diagonal matrix is also:-
 (A) Triangular Matrix (B) Scalar Matrix (C) Rectangular Matrix (D) Symmetric Matrix
- (10) $x + \frac{3}{x} = 4$ is:-
 (A) Reciprocal Equation (B) Transcendental Equation (C) Quadratic Equation (D) Identity
- (11) If the roots of $ax^2 + b = 0$ are real and unequal then:-
 (A) $ab > 0$ (B) $ab < 0$ (C) $ab = 0$ (D) $ab \geq 0$
- (12) Any improper rational fraction can be reduced to a mixed form by:-
 (A) Addition (B) Multiplication (C) Factorization (D) Division
- (13) With usual notations, the product of n Geometric Means between a and b is:-
 (A) $(G)^n$ (B) nG (C) $(A)^n$ (D) $(G)^{\frac{n}{2}}$
- (14) $1^2 + 2^2 + 3^2 + \dots + n^2 =$
 (A) $\frac{n(n+1)}{2}$ (B) $\frac{n(n+1)(n+2)}{6}$ (C) $\frac{n(n+1)(2n+1)}{6}$ (D) $\frac{n^2(n+1)^2}{4}$
- (15) If A and B are independent events then probability $P(A \cap B) =$
 (A) $P(A) \cap P(B)$ (B) $P(A) \cdot P(B)$ (C) $P(A) + P(B)$ (D) $P(A) + P(B) - P(A \cap B)$
- (16) $(n-1)(n-2)(n-3) \dots (n-r+1) =$
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- (17) There is no integer n for which 3^n is:- (A) Odd (B) Even (C) Prime (D) Complex
- (18) Expansion of $(1-2x)^{\frac{1}{3}}$ is valid if:-
 (A) $|x| < 1$ (B) $|x| < \frac{1}{3}$ (C) $|x| < 2$ (D) $|x| < \frac{1}{2}$
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MATHEMATICS PAPER-I GROUP-II

OBJECTIVE

TIME ALLOWED: 30 Minutes

MAXIMUM MARKS: 20

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MATHEMATICS PAPER-I GROUP-II

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