mathcity.org Merging man and maths	Federal Board – Model Paper Paper I Mathematics Paper-I , Year: 2008 Max. Marks: 100 , Available online @ http://www.mathcity.org/fsc

SECTION – A

Time allowed: 20 minutes Marks: 20

Note: Section-A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q.1 Insert the correct option i.e. A/B/C/D in the empty box provided opposite each part. Each part carries one mark.

i. $\{x \mid x \in \mathbb{R} \wedge 0 < x < 1\}$ is

A. A finite set
B. An Infinite set
C. Empty set
D. None of these

ii. The function $f : \mathbb{R} \to \mathbb{R}$ defined by $f = \{(x, y) \mid y = mx + c\}$.

A. A constant function
B. Linear function
C. Quadratic function
D. None of these

iii. If A is a real matrix then $\overline{A} =$

A. A^t
B. $-A$
C. A
D. A^{-1}

iv. If α, β are roots of $2x^2 - 4x + 5 = 0$ then $\frac{1}{\alpha} + \frac{1}{\beta} =$

A. $5/4$
B. $-5/4$
C. $4/5$
D. $-4/5$

v. $(1+\omega-\omega^2)^8 =$

A. 256
B. 256ω
C. -256
D. -256ω

vi. Partial fraction of $\dfrac{7x+25}{(x+3)(x+4)} =$

A. $\dfrac{3}{x}+\dfrac{5}{x+4}$
B. $\dfrac{6}{x+4}+\dfrac{5}{(x+4)^2}$
C. $\dfrac{4}{x+3}+\dfrac{3}{x+4}$
D. None of these

vii. Arithmetic mean between $3\sqrt{5}$ and $5\sqrt{5}$ is

A. $8\sqrt{5}$
B. $2\sqrt{5}$
C. $\sqrt{5}$
D. $4\sqrt{5}$

viii. If ${}^nC_8 = {}^nC_{12}$ then $n =$

A. 20
B. 4
C. 8
D. 12

ix. If $Sin\theta = \dfrac{12}{13}$ and terminal sides of the θ is in 1st quadrant, then $\cos\theta$

A. $-\dfrac{5}{13}$
B. $\dfrac{5}{13}$
C. 0
D. 1

x. The solution of the equation $4\cos^2 x - 3 = 0$ is

A. $\left\{\frac{\pi}{6} + 2n\pi\right\} \cup \left\{\frac{7\pi}{6} + 2n\pi\right\}, n \in Z$

B. $\left\{\frac{\pi}{3} + n\pi\right\} \cup \left\{\frac{2\pi}{3} + n\pi\right\}, n \in Z$

C. $\left\{\frac{\pi}{6} + 2n\pi\right\} \cup \left\{\frac{11\pi}{6} + 2n\pi\right\} \cup \left\{\frac{5\pi}{6} + 2n\pi\right\} \cup \left\{\frac{7\pi}{6} + 2n\pi\right\}, n \in \mathbb{Z}$

D. None of these

xi. If $a_{n-2} = 3n - 11$ find the nth term of the sequence

A. 11

B. $3n - 5$

C. $3n - 6$

D. None of these

xii. $\sqrt{1 + \sin\theta} =$

A. $\sin\frac{\theta}{2} + \cos\frac{\theta}{2}$

B. $\sin\frac{\theta}{2} - \cos\frac{\theta}{2}$

C. $\sin\theta + \cos\theta$

D. $\sin\theta - \cos\theta$

xiii. What is the number of elements of the power set of { }

A. 0

B. 1

C. 2

D. 3

xiv. Area of ΔABC =

A. $ab\sin\alpha$

B. $\frac{1}{2}ab\sin\alpha$

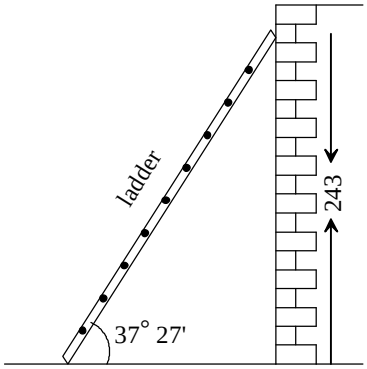
C. $\frac{1}{2}ac\sin\gamma$

D. $\frac{1}{2}ac\sin\beta$

xv. The set $\{2^n \mid n \in Z\}$ is a group w.r.t

A. Addition
B. Subtraction
C. Multiplication
D. Division

xvi. From the figure, what is the length of ladder.



A. 63°
B. $62^\circ 40'$
C. $63^\circ 40'$
D. 62°

xvii. $\frac{1}{r} =$

A. $\frac{1}{r_1} + \frac{1}{r_2}$
B. $\frac{1}{r_2} + \frac{1}{r_3}$
C. $\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3}$
D. None of these.

xviii. The sum of the infinite geometric series exist if

A. $|r| < 1$
B. $|r| > 1$
C. $r = 1$
D. $r = -1$

xix. The probability that a slip of number divided by 5 is picked from the bearing numbers 1,2,3,…,10 is

A. $\frac{1}{5}$

B. $\frac{1}{4}$

C. $\frac{1}{3}$

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

xx. If x is so small that it's square and higher powers can be neglected then $\frac{\sqrt{4+x}}{(1-x)^3} =$

A. $2-\frac{25x}{4}$

B. $6-\frac{24x}{7}$

C. $6+\frac{24x}{7}$

D. $2+\frac{25x}{4}$

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Q. No.1: Total Marks: 20

Marks Obtained:

SECTION-B & C

Time allowed: 2.40 hours Total Marks: 80

Note: Sections 'B' and 'C' comprise pages 1-3 and questions therein are to be answered on the separately provided answer book. Answer any ten questions from section 'B' and attempt any five questions from section 'C'. Use supplementary answer sheet i.e., sheet B if required. Write your answers neatly and legibly.

SECTION-B

(Marks: 40)

Note: Attempt any **TEN** questions.

2. Prove that sum as well as the product of any two conjugate complex numbers is a real number.

3. Show that the statement given below is tautology:-
$$\sim q \wedge (p \to q) \to \sim p$$

4. If A and B are square matrices of the same order, then explain why in general; $(A-B)^2 \neq A^2 - 2AB + B^2$

5. Find the solution set of the following equation which lies in $[0, 2\pi]$.
$$\sec\theta = -2$$

6. Find the period and domain of $\operatorname{cosec}\frac{x}{4}$.

7. Sum the series; $3+5-7+9+11-13+15+17-19+.....$ to $3n$ terms.

8. A bag contain 40 balls out of which 5 are green, 15 are black and the remaining are yellow, A ball is taken out of the bag. Find the probability that the ball is green.

9. Sum the series up n terms; $2+(2+5)+(2+5+8)+...$

10. Solve; $\sin x + \cos x = 0$.

11. Prove that; $\cot^4\theta + \cot^2\theta = \operatorname{cosec}^4\theta - \operatorname{cosec}^2\theta$

12. If α, β, γ are the angles of the $\triangle ABC$, Prove that
$$\tan\alpha + \tan\beta + \tan\gamma = \tan\alpha \tan\beta \tan\gamma$$

13. Use binomial theorem to find the value of $(0.998)^{\frac{1}{3}}$ to three places of decimals.

14. Use synthetic division to show that x is the solution of the polynomial and use the result to factorize the polynomial completely.

$$x^3 - 7x + 6 = 0 \quad , \quad x = 2$$

15. If $(G, *)$ is a group with e its identity, then e is unique.

SECTION – C

(Marks: 40)

Note: Attempt any **FIVE** questions. Each question carries equal marks.

(Marks 5x8=40)

16. Simplify $\left(-\frac{1}{2}+\frac{\sqrt{3}}{2}\right)^3$ by using De Moivre's Theorem.

17. Find the inverse of matrix by column operation: $\begin{bmatrix} 1 & -3 & 2 \\ 2 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$.

18. Resolve $\frac{3x-11}{(x^2+1)(x+3)}$ into partial fraction.

19. If the sum of the four consecutive terms of a G.P. is 80 and A.M of the second and the fourth of them is 30. Find the terms.

20. Draw the graph of $y = \cos\frac{x}{2}$ in $x \in [-\pi, \pi]$.

21. The angle of elevation of the top of a 60 m high tower from a point A, on the same level as the foot of the tower is 25°. Find the angle of elevation of the top of the tower from a point B, 20 m nearer to A from the foot of the tower.

22. Prove that: $\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{3}{5} - \tan^{-1}\frac{8}{19} = \frac{\pi}{4}$.
