UNIVERSITY OF THE PUNJAB
B.S. 4 Years Program :Third Semester – 2020
Paper: Elementary Mathematics-I
Course Code: MATH-111   Part – I (Compulsory)   Time: 30Min. Marks: 10

Roll No. in Fig. ....

Roll No. in Words. ....

....

....
Signature of Supdt.:

Q.1. Encircle the right answer cutting and overwriting is not allowed. (10x1=10)

(i) The sum of two irrational numbers is -----
(a) always a rational number
(b) always an irrational number
(c) may or may not be irrational
(d) None of these

(ii) If k is a real number then $k(a,b) = $ -----
(a) $(ka, kb) = $
(b) $(ka, b) = $
(c) $(a, kb) = $
(d) None of these

(iii) The matrix $A = \begin{bmatrix} 4 & \lambda & 3 \\ 7 & 3 & 6 \\ 2 & 3 & 1 \end{bmatrix}$ is singular for $\lambda = $ -----
(b)
(a) 4
(b) 5
(c) 3
(d) None of these

(iv) The roots of equation $x^{1/2} - x^{1/4} - 6 = 0$ are -----
(a) 8, 16
(b) 16, 81
(c) -16- -81
(d) None of these

(v) The value of $\binom{n}{1} + 2\binom{n}{2} + 3\binom{n}{3} + ... + n\binom{n}{n} = $ -----
(a) $n2^n$
(b) $(n+1)2^n$
(c) $(n-1)2^n$
(d) None of these

(vi) The nature of roots of equation $9x^2 - 12x + 4 = 0$ are -----
(a) real and unequal
(b) real and equal
(c) imaginary
(d) None of these

(vii) The number of terms in the expansion of $(2a + b)^{10}$ is -----
(a) 10
(b) 11
(c) 12
(d) None of these

(viii) The $(r+1)$ th term in the expansion of $(a+x)^n$ is -----
(a) $\binom{n}{r}a^{n-r}x^r$
(b) $\binom{n}{r+1}a^{n-r-1}x^r$
(c) $\binom{n}{r+1}a^{n-r}x^r$
(d) None of these

(ix) The angle $21°15'40''$ in degree, minute, second is equal to -----
(a) $21.497°$
(b) $21.256°$
(c) $21.786°$
(d) None of these

(x) The value of $\sin 1530° = $ -----
(a) 0
(b) 1
(c) $\dfrac{\sqrt{3}}{2}$
(d) None of these

UNIVERSITY OF THE PUNJAB
B.S. 4 Years Program :Third Semester – 2020

Roll No. ....

Paper: Elementary Mathematics-I

Time: 2 Hrs. 30 Min.   Marks: 50

Course Code: MATH-111   Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2.   Solve the following: (10x2=20)

(i)   Simplify and express $\dfrac{(5,2)}{(3,4)}$ in the form $a+bi$.

(ii)   Find the value of x, y if $\begin{bmatrix} x+3 & 1 \\ -3 & 3y-4 \end{bmatrix} = \begin{bmatrix} y & 1 \\ -3 & 2x \end{bmatrix}$

(iii)   Find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ if exists.

(iv)   Solve the equation $x^{2/5} - 6x^{1/5} + 8 = 0$

(v)   Find the sum of arithmetic series $1.11 + 1.41 + 1.71 + ... + a_{10}$.

(vi)   Find the term involving x^5 in the expansion of $\left(\dfrac{3}{2}x - \dfrac{1}{3x} \right)^{11}$.

(vii)   Find the 5th term of the G.P. $3, 6, 12, ...$

(viii) Find the length of equatorial arc subtending an angle 1° at the Centre of earth, taking radius of earth 6400 km.

(ix)   Find the value of $\cos 1530^{\circ}$

(x)   Expand $(8 - 5x)^{-2/3}$ up to the first four terms.

Solve the following: (6x5=30)

Q.3   Use matrices to solve the system: $\begin{aligned} x + y &= 2 \\ 2x - z &= 1 \\ 2y - 3z &= -1 \end{aligned}$

Q.4   Solve the equation $2x^4 + 3x^3 - 4x^2 - 3x + 2 = 0$.

Q.5   A man deposits in a bank Rs 20 in the first year, Rs 40 in the second year, Rs 80 in the third year and so on. Find amount he will have deposited in the bank by the 7th year.

Q.6   Expand and simplify $(2+i)^5 - (2-i)^5$.

Q.7   Find x if $\tan^2 45^{\circ} - \cos^2 60^{\circ} = x \sin 45^{\circ} \cos 45^{\circ} \tan 60^{\circ}$

Q.8   Prove that $\sqrt{\dfrac{1 + \cos \theta}{1 - \cos \theta}} = \cos ec\theta + \cot \theta$