P P SAVANI UNIVERSITY

First Semester of B. Sc. (IT) Examination

November 2022

SESH1040 Mathematics for Computer Applications

18.11.2022, Tuesday **Time: 01:00 p.m. To 03:30 p.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

			CO	BTL
Q - 1	**Answer the Following:**	**[06]**		
(i)	$(22.21875)_{10} = (?)_8$		**1**	**5**
(ii)	The first complement of 1010110110=_____.		**1**	**5**
(iii)	Write the definition of Function.		**2**	**1/2**
(iv)	What is the definition of Polynomial function? Give one example of polynomial function.		**2**	**1/2**
(v)	$\lceil -3.9 \rceil =$ _____		**1**	**4**
(vi)	Find $(0.542)_{16} = (?)_{10}$		**1**	**5**
	Answer the following. (Attempt any Four)			
Q - 2	Represent $(1750.125)_{10}$ in single and double precision format.	**[06]**	**1**	**5/6**
Q - 3	Solve the following.	**[06]**	**1**	**5**
	(a) $(100100001)_2 - (1001111)_2 = (?)_2$ **(b)** $(ABCD)_{16} - (123)_{16} = (?)_{16}$			
	(c) $(111)_2 \times (111)_2 = (?)_2$ **(d)** $(A6C1)_{16} \times (11)_{16} = (?)_{16}$			
Q - 4	Let p and q be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," and "Sharks have been spotted near the shore," respectively. Express each of these compound propositions as an English sentence.	**[06]**	**2**	**2/4**
	(a) $\neg q$ **(b)** $p \wedge q$ **(c)** $\neg p \vee q$ **(d)** $p \rightarrow \neg q$ **(e)** $\neg q \rightarrow p$			
Q - 5	Show that below statements are logically equivalent or not. Use the truth table method.	**[06]**	**2**	**2/4**
	(a) $(p \wedge q) \rightarrow r$ and $(p \rightarrow r) \wedge (q \rightarrow r)$ **(b)** $(p \rightarrow q) \rightarrow r$ and $p \rightarrow (q \rightarrow r)$			
Q - 6	Find a relation of the below table on the sets $A = \{0,1,2,3,4\}$ and $B = \{0,1,2,3\}$, where $a \in A, b \in B$ and $(a, b) \in R$,	**[06]**	**2**	**2/6**
	(a) $a = b$ **(b)** $a < b$ **(c)** $a + b = 3$			
	(d) $a \mid b$ **(e)** $a \times b = 4$			
Q - 7	Find the M_{RUS}, $M_{R \cap S}$, $M_{R^{-1}}$, $M_{S^{-1}}$ where $M_R = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 0 \end{bmatrix}$ and $M_S = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$.	**[06]**	**3**	**4**

SECTION – II

Q - 1	**Answer the Following:**	**[06]**		
(i)	$\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} =$ _____.		**3**	**5**
(ii)	What is the definition of Minor?		**2**	**1/2**
(iii)	Find the equation of the circle joining the points $(1, -1)$ and $(-2,3)$ as diameter.		**3**	**1/2**
(iv)	What is the general equation, center and radius of the circle?		**2**	**1/2**
(v)	Write the Equation of parabola which symmetrical about the x axis.		**2/3**	**1/2**
(vi)	Write Unit matrix of $m \times n$ order.		**2**	**2**

Answer the following. (Attempt any Four)

Q - 2	Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the latus rectum of the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$.	**[06]**	**2**	**3/5**
Q - 3	If ${}^{2n+1}P_{n-1} : {}^{2n-1}P_n = 3:5$ then find the value of n.	**[06]**	**3**	**4/5**
Q - 4	Without expanding show that, $\begin{vmatrix} a & b & c \\ x & y & z \\ p & q & r \end{vmatrix} = \begin{vmatrix} y & b & q \\ x & a & p \\ z & c & r \end{vmatrix} = \begin{vmatrix} x & y & z \\ p & q & r \\ a & b & c \end{vmatrix}$	**[06]**	**2**	**4**
Q - 5	Find the solution using Cramer's rule. $2x - 3y + 7z = 5$ $3x + y - 3z = 13$ $2x + 19y - 47z = 32$	**[06]**	**2**	**5/6**
Q - 6	Find the coordinates of the foci, the vertices, eccentricity, and the length of the latus rectum of the hyperbola $y^2 - 16x^2 = 16$ and also write the definitions of transverse axis and conjugate axis.	**[06]**	**2/3**	**5**
Q - 7	Prove that $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = (1+xyz)(y-x)(z-x)(z-y)$.	**[06]**	**2/3**	**4**

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CO : Course Outcome Number BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create