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END SEMESTER EXAMINATION, EVEN SEM 2022-23

Time : 3 hours Program Name : BBA Course Name : Business Mathematics

Total Marks : 100 Semester : II Course Code : UVC2013

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Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the time.

Q. No 1	Attempt Any Four Parts, Each Question Carries 5 Marks	CO	BL
(a)	A car covered 65 km, 70 km, 68 km, 70 km, and 55 km in 5 successive hours. Find the average speed of car per hour	CO 1	3
(b)	The nth term of a sequence is $a_n = 4n - 3$. Show that it is an AP. Also, find a_{17} .	CO 1	3
(c)	The population of a town increases by 10% annually. If the present population is 22000, find its population a year ago.	CO 1	3
(d)	Evaluate: $\lim_{x \to 0} \frac{\sin 4x}{\sin 2x}$.	CO 1	3
(e)	Define the arithmetic mean. Discuss its merits & demerits	CO 1	1
Q. No 2	Attempt Any Four Parts, Each Question Carries 5 Marks.	со	BL
(a)	Evaluate: (i) $\frac{8!}{5!2!}$ (ii) ${}^{6}C_{3}$.	CO 2	3
(b)	Define the following: (i) Impossible Event (ii) Sure Events (iii) Sample space	CO 2	1

(0)	(iv) Compound Events.	CO 2	1	
(c)	Using binomial theorem, evaluate (101) ⁴ .	CO 2	3	1
(d)	Evaluate: $\frac{n!}{r!(n-r)!}$ when $n = 6, r = 3$.	CO 2	3	-
(e)	In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?	CO 2	2	

Q. No 3	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	If $A = \begin{bmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -2 & 1 & 1 \end{bmatrix}$ & $B = \begin{bmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{bmatrix}$ then verify that $(A + B)' = A' + B'$	CO 3	2
(b)	Using Cofactors of elements of third row, evaluate value of determinant $\Delta = \begin{vmatrix} 4 & 3 & 7 \\ 2 & 1 & 1 \\ 0 & 0 & 3 \end{vmatrix}$	CO 3	3
(c)	Define the following (i)Equality of matrices (ii) Transpose of a Matrix (iii) Diagonal matrix(iv) Identity matrix.	CO 3	1
(d)	Let $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 8 \\ 7 & 9 \end{bmatrix}$. Verify that $(AB)^{-1} = B^{-1}A^{-1}$.	CO 3	2
(e)	If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 5A + 7I = O$. Hence find A^{-1} .	CO 3	3

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Q. No 4	Attempt Any Two Parts, Each Question Carries 10 Marks,	CO	BL
	Find the second order derivatives of function $f(x) = x^{20} - 10 x^9 + 25 x^6$.	CO 4	3
(D)	Evaluate the definite integral of $f(x) = x^2 - 4x + 3$ from $x = 1$ to $x = 3$.	CO 4	3
(c)	Evaluate: $\int_{-1}^{1} 5x^4 \sqrt{x^5 + 1} dx$	CO 4	3

Q. No 5	Attempt Any Two Parts, Each Question Courses 10 Marks	<u> </u>	DI
(a)	Let $A = \{2, 4, 6, 8\}$ and $B = \{6, 8, 10, 12\}$. Obtain (i) $A \cup B$ (ii) $A - B$ (iii) $B - A$ (iv) $A \cap B$ (i) $A \cap (A - B)$	CO 5	2
(b)	Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real functions. Find (i) $(f + g)(x) = (i)(f - 2x)(x)$	CO 5	2
(c)	$(i) (i + g) (x) (ii) (i - g) (x) (iii) (f.g) (x) (iv) \frac{f}{g} (x) (v) fog(x).$ Let $A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{2, 4\}, A = \{1, 2, 3\}, B = \{1, 3, 3\},$		
	$(i) \mathbf{A} \times (\mathbf{B} \cap \mathbf{C}) (ii) (\mathbf{A} \times \mathbf{B}) \cap (\mathbf{A} \times \mathbf{C}) (iii) \mathbf{A} \times (\mathbf{B} \cup \mathbf{C}) (iv) (\mathbf{A} \times \mathbf{B}) \cup (\mathbf{A} \times \mathbf{C})$	CO 5	2

--End of Paper--

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