

CONTINUOUS INTERNAL EVALUATION - 2

Dept:CS/CD/AI | Sem / Div:II/A,B | Sub:Mathematics-II | S.Code:BMATS201
for CSE stream

Date:26-06-24 | Time: 9:30-11:00 | Max Marks: 50 | Elective:N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
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PART A

1 a	Show that cylindrical coordinate system is orthogonal	8	L2	CO2
b	Evaluate $\int_{-c}^c \int_{-b}^b \int_{-a}^a (x^2 + y^2 + z^2) dz dy dx$	8	L2	CO1
c	By changing into polar coordinates, evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dy dx$	9	L2	CO1

OR

2 a	Evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} xy dy dx$ by changing the order of integration	8	L2	CO1
b	Find the area of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ by double integration	8	L2	CO1
c	Prove that $\beta(m, n) = \frac{\Gamma(m) \cdot \Gamma(n)}{\Gamma(m+n)}$	9	L1	CO1

PART B

3	a	Define subspace .Prove that intersection of 2 sub spaces of a vector subspace is also a subspace	8	L1	CO3
	b	Show that the function $T: R^2 \rightarrow R^3$ defined by $T(x,y)=(x+y,x-y, y)$ is linear	9	L2	CO3
	c	State the Rank -Nullity theorem and verify the theorem for the function $T: R^3 \rightarrow R^3$ defined by $T(x,y,z)=(x+2y-z, y+z, x+y-2z)$	9	L2	CO3

OR

4	a	(i)Determine the following vectors $(2,2,1), (1, 3, 7)$ and $(1, 2, 2)$ are linearly independent or not in R^3 (ii)Determine whether the vectors $(1, 2, 3), (3,1, 7)$ & $(2,5, 8)$ are linearly dependent or linearly independent.	8	L2	CO3
	b	Find the dimension and basis of the subspace spanned by the vectors $(2,4,2),(1,-1,0) (1,2,1)$ and $(0,3,1)$ in $V_3(R)$	8	L2	CO3
	c	Define inner product space.(i)Let $f(t)=4t+3, g(t)= t^2$ and $\langle f, g \rangle = \int_0^1 f(t) g(t) dt$ Find $\langle f, g \rangle$ and norm of g (ii)Consider the vectors $u=(1,2,4), v=(2,-3,5) w=(4,2,-3)$ in R^3 .Find a) $\langle u.v \rangle$ b) $\langle u.w \rangle$ c) $\langle v.w \rangle$ d) $\langle (u+v).v \rangle$	9	L3	CO3

Prepared by: Pari
20/6/24

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22/6/2024