Consider the following two relations, R(A,B) and S(A,C):

	\boldsymbol{A}	\boldsymbol{B}
R	10	20
	20	30
	30	40
	30	50
	50	95

\boldsymbol{S}	\boldsymbol{A}	\boldsymbol{C}
	10	90
	30	45
	40	80

The total number of tuples obtained by evaluating the following expression $\sigma_{B < C}$ $(R \bowtie_{R.A=S.A} S)$ is ____









A relation r(A,B) in a relational database has 1200 tuples. The attribute A has integer values ranging from 6 to 20, and the attribute B has integer values ranging from 1 to 20. Assume that the attributes A and B are independently distributed.

The estimated number of tuples in the output of $\sigma_{(A>10)\lor(B=18)}(r)$ is ______



1200



()



Let R and S be relational schemes such that R={a,b,c} and S={c}. Now consider the following queries on the database:

$$I.\pi_{R-S}(r)-\pi_{R-S}(\pi_{R-S}(r) imes S-\pi_{R-S,S}(r))$$

$$II.\{t|t\in\pi_{R-S}(r)\land orall u\in s(\exists v\in r(u=v[s]\land t=v[R-S]))\}$$

$$III.\{t|t\in\pi_{R-S}(r)\land \forall v\in r(\exists u\in s(u=v[s]\land t=v[R-S]))\}$$

IV. Select R.a, R.b From R,S Where R.c=S.c

Which of the above queries are equivalent?



I and II



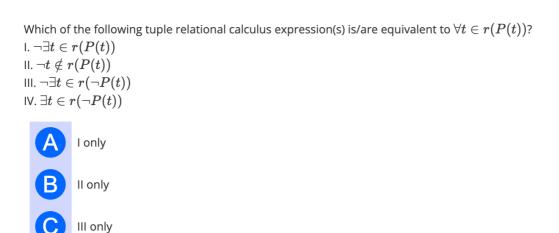
I and III



II and IV



III and IV



Consider the relation employee(name, sex, supervisorName) with name as the key. supervisorName gives the name of the supervisor of the employee under consideration. What does the following Tuple Relational Calculus query produce?

{e.name|employee(e) ^}

III and IV only

$$(\forall x) [\neg employee(x) \lor x.supervisorName \neq e.name \lor x.sex = "male"] }$$

- A Names of employees with a male supervisor.
- Names of employees with no immediate male subordinates
- Names of employees with no immediate female subordinates.
- Names of employees with a female supervisor

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- A Names of employees with a male supervisor.
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- Names of employees with no immediate female subordinates.
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Which of the following relational query languages have the same expressive power?

- I. Relational algebra
- II. Tuple relational calculus restricted to safe expressions
- III. Domain relational calculus restricted to safe expressions



II and III only



I and II only



I and III only



I, II and III

The relational algebra expression equivalent to the following tuple calculus expression: $\{t\mid t\in r\wedge (t[A]=10\wedge t[B]=20)\}$ is



$$\sigma_{(A=10ee B=20)}(r)$$



$$oxed{\mathsf{B}} \hspace{0.1 cm} \sigma_{(A=10)}(r) \cup \sigma_{(B=20)}(r)$$



$$\sigma_{(A=10)}(r)\cap\sigma_{(B=20)}(r)$$

$$\sigma_{(A=10)}(r)-\sigma_{(B=20)}(r)$$