Score	Roll Number	Section
1	20AE10011	11
1	20AE10031	11
4	20AE30006	11
1	20AG10020	11
0	20AG10040	11
3	20AG30017	11
4	20BT30001	11
1	20BT30021	11
4	20CE10009	11
2	20CE10069	11
4	20CH10006	11
4	20CH10046	11
3	20CH10066	11
5	20CH30027	11
7	20CS10030	11
1	20CS10050	11
10	20CS10070	11
2	20CS30031	11
10	20CS30051	11
3	20CY20011	11
3	20CY20031	11
3	20EC10014	11
7	20EC10034	11
6	20EC10054	11
2	20EC10074	11
2	20EC30022	11
4	20EE10001	11
3	20EE10021	11
8	20EE10041	11
1	20EE10061	11
5	20GG20040	11
5	20GG20040	11
6	20HS20048	11
3	20IE10010	11
7	20IE10029	11
3	20IM10023	11
1	20IM10042	11
4	20MA20009	11
5	20MA20028	11
3	20MA20066	11
3	20ME10019	11
5	20ME10038	11
8	20ME10057	11
5	20ME10076	11
5	20ME10095	11
3	20ME30019	11
2	20ME30038	11
0	20ME30057	11
5	20MF10003	11
4	20MF10022	11
1	20MF3IM18	11
1	20MI10016	11
1	20MI10035	11
5	20MI10054	11
4	20MI33008	11
1	20MT10021	11
5	20MT10059	11
6	20MT30017	11

Score	Roll Number	Section
1	20AE10032	12
5	20AE30007	12
3	20AG10021	12
2	20AG10041	12
7	20AG30018	12
5	20AG30038	12
1	20BT10017	12
1	20BT30002	12
0	20BT30022	12
4	20CE10030	12
5	20CE10050	12
3	20CE10070	12
1	20CE10090	12
4	20CE30020	12
6	20CH10027	12
7	20CH10047	12
0	20CH10067	12
8	20CH30008	12
2	20CH30028	12
7	20CS10011	12
5	20CS10031	12
9	20CS10051	12
10	20CS10071	12
8	20CS30012	12
5	20CS30032	12
4	20CS30052	12
5	20CY20012	12
6	20CY20032	12
4	20EC10015	12
1	20EC10035	12
1	20EC30003	12
4	20EC30023	12
2	20EC30043	12
3	20EE10002	12
5	20EE10042	12
5	20EE10042	12
9	20EE10062	12
6	20EE10081	12
6	20EX20003	12
3	20GG20022	12
5	20GG20041	13
5	20GG20041	13
5	20GG20041	13
3	20HS20011	12
2	20HS20030	12
0	20HS20049	12
3	20IE10011	12
1	20IE10030	12
7	20IM10005	12
3	20IM10024	12
7	20IM10043	12
3	20IM30019	12
6	20MA20010	12
7	20MA20048	12
1	20ME10001	12
3	20ME10020	12
7	20ME10039	12
1	20ME10058	12

3	20NA10006	11
1	20NA10025	11
4	20NA30019	11
5	20PH20005	11
5	20PH20005	11
5	20PH20005	11

7	20ME10077	12
4	20ME30001	12
5	20ME30020	12
4	20ME30039	12
2	20ME30058	12
9	20MF10004	12
7	20MF10023	12
5	20MF3IM19	12
0	20MI10017	12
5	20MI10036	12
2	20MI31015	12
2	20MT10003	12
1	20MT10041	12
4	20MT10060	12
3	20MT30018	12
4	20NA10007	12
4	20NA10026	12
3	20NA30001	12
3	20NA30020	12
3	20PH20006	12
2	20PH20044	12

Let $f: \mathbb{R}^2 \to \mathbb{R}$ be a function defined by

$$f(x,y) = \begin{cases} \dfrac{y^3}{x^2+y^2}, & (x,y) \neq 0 \\ 0, & (x,y) = 0 \end{cases}$$

Then which of the following statements is/are FALSE?

A $\quad f(x,y)$ is continuous

B $\quad f_x(0,0)$ does not exits but $f_y(0,0)$ exist

C $\quad f_y(0,0)$ exists and $f_y(x,y)$ is continuous at $(0,0)$

D $\quad f$ is NOT differentiable

ANS: B and C

Consider the function $f(x, y) = 3x^2 + 4xy + y^2$.

If $S = \{(x, y) \in \mathbb{R}^2 \colon x^2 + y^2 = 1\}$, then which of the following statements is/are TRUE?

A The maximum value of f on S is $3 + \sqrt{5}$

B The minimum value of f on S is $3 - \sqrt{5}$

C The maximum value of f on S is $2 + \sqrt{5}$

D The minimum value of f on S is $2 - \sqrt{5}$

ANS: C and D

Let $S = \{(x, y) \in \mathbb{R}^2 : 2 \le x \le y \le 4\}$. Then the value of the integral

$$\iint_S \frac{1}{4-x}\, dx\, dy$$

is

ANS: 2

Let $S \in \mathbb{R}^2$ be the region bounded by the parallelogram with vertices at the point $(1,0), (3,2), (3,5)$ and $(1,3)$. Then the value of the integral

$$\iint_S (x+2y)\, dx\, dy$$

is

ANS: 42

Let $S = \{(x, y) \in \mathbb{R}^2 : 0 \le x \le \pi, \min\{\sin x, \cos x\} \le y \le \max\{\sin x, \cos x\}\}$. If α is the area of S, then the value of $2\sqrt{2}\,\alpha$ is equal to

ANS: 8

Let a particular integral of the differential equation $(D^2 + 2D + 1)y = 2x + x^3$ be $ax^3 + bx^2 + cx + d$. The value of $|a + b + c + d|$ is

ANS: 13

Let the general solution of the differential equation $(D^2 - 13D + 12)y = 0$ be $c_1 e^{ax} + c_2 e^{bx}$ $(b > a)$. The value of $\frac{b}{a}$ is

ANS: 12