CONTINUITY AND DIFFERENTIABILITY

MEAN VALUE THEOREM

EXERCISE

Q.1 Function f should be _____ on [a,b] according to Rolle's theorem.

(a) continuous (b) non-continuous

(c) integral (d) non-existent

Q.2 Function f is differential on (a,b) according to Rolle's theorem.

(a) True

(b) False

Q.3 What is the relation between f(a) and f(b) according to Rolle's theorem?

(a) Equals to (b) Greater than

(c) Less than (d) Unequal

Q.4 Does Rolle's theorem applicable if f(a) is not equal to f(b)?

(a) Yes (b) No

(c) Under particular conditions (d) May be

Q.5 Another form of Rolle's theorem for the differential condition is _____

(a) f is differentiable on (a,ah)

(b) f is differentiable on (a,a-h)

(c) f is differentiable on (a,a/h)

(d) f is differentiable on (a,a+h)

Q.6 Another form of Rolle's theorem for the continuous condition is _____

(a) f is continuous on [a,a-h]

(b) f is continuous on [a,h]

(c) f is continuous on [a,a+h]

(d) f is continuous on [a,ah]

Q.7 What is the relation between f(a) and f(h) according to another form of Rolle's theorem?

a) $f(a) < f(a+h)$

b) $f(a) = f(a+h)$

c) $f(a) = f(a-h)$

d) $f(a) > f(a+h)$

Q.8 Function f is not continuous on [a,b] to satisfy Lagrange's mean value theorem.

(a) False

(b) True

Q.9 What are/is the conditions to satify Lagrange's mean value theorem?

(a) f is continuous on [a,b]

(b) f is differentiable on (a,b)

(c) f is differentiable and continuous on (a,b)

(d) f is differentiable and non-continuous on (a,b)

Q.10 Function f is differentiable on [a,b] to satisfy Lagrange's mean value theorem.

(a) True

(b) False

Q.11 Lagrange's mean value theorem is also called as _____

(a) Euclid's theorem

(b) Rolle's theorem

(c) a special case of Rolle's theorem

(d) the mean value theorem

Q.12 Rolle's theorem is a special case of _____

(a) Euclid's theorem

(b) another form of Rolle's theorem

(c) Lagrange's mean value theorem

(d) Joule's theorem

Q.13 Is Rolle's theorem applicable to f(x) = tan x on $\left[\frac{\pi}{4}, \frac{5\pi}{4}\right]$?

(a) Yes

(b) No

Q.14 What is the formula for Lagrange's theorem?

(a) $f'(c) = \frac{f(a)+f(b)}{b-a}$

(b) $f'(c) = \frac{f(b)-f(a)}{b-a}$

(c) $f'(c) = \frac{f(a)+f(b)}{b+a}$

(d) $f'(c) = \frac{f(a)-f(b)}{b+a}$

Q.15 Find 'C' using Lagranges's mean value theorem, if $f(x) = e^x, a = 0, b = 1.$

(a) e^{e-1}

(b) e-1

(c) $\log_e^{e+1}$

(d) $\log_e^{e-1}$

ANSWER KEY

1. (a)

2. (a)

3. (a)

4. (b)

5. (d)

6. (c)

7. (b)

8. (a)

9. (c)

10. (a)

11. (d)

12. (c)

13. (b)

14. (b)

15. (d)