



UNIVERSITY OF THE PUNJAB

Third Semester – 2019

Examination: B.S. 4 Years Program

Roll No. in Fig.

Roll No. in Words.

PAPER: Elementary Mathematics-II (Calculus)

MAX. TIME: 30 Min.

Course Code: MATH-211/MTH-21107 Part-I (Compulsory)

MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

- 1) If $f(x) = \cos \sqrt{x}$ then the natural domain of f is
 - a) $(-\infty, +\infty)$
 - b) $[1, +\infty)$
 - c) $(0, +\infty)$
 - d) none of these
- 2) The solution of the inequality $-4 < Y - 3 < 4$
 - a) $(1, 7)$
 - b) $(-1, 7)$
 - c) $(-1, -7)$
 - d) none of these
- 3) $\lim_{x \rightarrow \infty} (1+x)^{1/x}$
 - a) e
 - b) $-e$
 - c) 0
 - d) ∞
- 4) $d \ln |ex| / dx =$
 - a) $1/(x \ln e)$
 - b) $1/(x \ln a)$
 - c) $\pm x$
 - d) none above
- 5) $1/x^2 + 1$ is the derivative of
 - a) $\sin^{-1}x$
 - b) $\cos^{-1}x$
 - c) $\tan^{-1}x$
 - d) $\cot^{-1}x$
- 6) $\int \left(\frac{1}{x+1}\right) dx$
 - a) $\ln(x+1)$
 - b) $1/x \ln a$
 - c) $-1/x^2$
 - d) none of these
- 7) $\int \ln \cos x \, dx$
 - a) $\sin x + c$
 - b) $\ln \cos x + c$
 - c) $\ln \sin x + c$
 - d) none of these
- 8) $\int \left(\frac{1}{\sqrt{1-x^2}}\right) dx$
 - a) $\sin^{-1}x$
 - b) $\cos^{-1}x$
 - c) $\tan^{-1}x$
 - d) $\cot^{-1}x$
- 9) $\int_0^1 1/\sqrt{1-x^2}$
 - a) 0
 - b) 30
 - c) 60
 - d) 90
- 10) $\int \ln \sec x \, dx$
 - a) $-\csc x + c$
 - b) $\sec x + c$
 - c) $\cot x + c$
 - d) none of these



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PAPER: Elementary Mathematics-II (Calculus)

Course Code: MATH-211/MTH-21107 Part – II

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q2: write the answers of the following questions (5 x 4 = 20 Marks)

i) Define continuity and Solve $4+7x \leq 2x-10$

ii) Evaluate $\lim_{x \rightarrow 0} \frac{\ln(\tan x)^2}{\ln x}$

iii) Find dy/dx if $y=a^x$

iv) Evaluate $\int x e^x dx$

v) Evaluate $\int_2^1 \frac{dx}{(2-x)^{\frac{1}{3}}}$

Long Questions

(3x10=30)

Q3

a) Solve $\frac{2x-5}{x-2} < 1$

b) Discuss the continuity of function $f(x)=x \sin(1/x)$ at $x=0$

Q4

Differentiate w.r.t x

a) $\sin(\sqrt{1+\cos x})$

b) $y= x \ln x \cos^2 \pi x$

Q5

Evaluate

a) $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$

b) $\int_0^2 \frac{x}{\sqrt{1+x^3}} dx$