

Department of Mathematics

M-106

Second Mid Term Exam

Summer Term(1435)

Max. Marks: 25

Time: 90 minutes

----- رقم الجامعي ----- اسم الطالب: -----

Marks:	Multiple Choice(1-to-5).....[]
	Question (6).....[]
	Question (7).....[]
	Question (8).....[]
	Question (9).....[]
	Question (10).....[]
	Total.....[]

Marking Scheme:[From Q.No.1-to-Q.No.5 one mark each]

Multiple Choices

Q. No:	1	2	3	4	5
{a,b,c,d}					

Q.No:1 To evaluate the integral $\int x^3 \sqrt{x^2 - 8} dx$, we use the substitution:

- (a) $x = 2 \sec \theta$ (b) $x = 2\sqrt{2} \cos \theta$ (c) $x = 2\sqrt{2} \sec \theta$ (d) $x = 2\sqrt{2} \tan \theta$

Q.No:2 The substitution $u = \tan\left(\frac{x}{2}\right)$ transforms the integral $\int \frac{1}{\sin x} dx$ into

- (a) $\int \frac{2}{u} du$ (b) $\int \frac{1}{u} du$ (c) $\int \frac{2}{2-u^2} du$ (d) $\int \frac{2}{u^2-1} du$

Q.No:3 The improper integral $\int_0^{\infty} \frac{1}{(x-1)^2} dx$

- (a) Converges to 0 (b) Diverges (c) Converges to 1 (d) Converges 2

Q.No:4 The value of the integral $\int \frac{1}{\sqrt{-x^2 + 4x + 12}} dx$ is equal to;

- (a) $\frac{1}{2} \sin^{-1}\left(\frac{x-2}{4}\right) + c$, (b) $\sin^{-1}\left(\frac{x-2}{4}\right) + c$, (c) $\frac{1}{2} \sin^{-1}\left(\frac{x+2}{2}\right) + c$
 (d) $\sin^{-1}\left(\frac{x+2}{2}\right) + c$

Q.No:5 The substitution $u = x^{1/6}$ transforms the integral $\int \frac{\sqrt[3]{x}-1}{\sqrt{x}+1} dx$ into

- (a) $\int \frac{6(u^7 - u^5)}{u^3 + 1} du$, (b) $\int \frac{6(u^7 + u^5)}{u^3 + 1} du$, (c) $\int \frac{6u^2}{u+1} du$ (d) $\int \frac{6u^3}{u^2 + 1} du$

Question No: 6 Evaluate the integral $\int \tan^3 x \sec^3 x dx$

Question No: 7 Evaluate the integral $\int \frac{1}{x^2 \sqrt{x^2 + 1}} dx$

Question No:8 Evaluate the integral by using method of partial fraction

$$\int \frac{1}{x^3 - 4x} dx$$

Question No:9 Evaluate the integral $\int e^x \sin x dx$.

Question No:10 Sketch region R bounded by the graphs of $y = x^2 - 1$ and $y = 8$ and find its area.