Page: Date:

May 2018

1- A measurable space (X, A) is a set X and a σ-algebra A on X. True Defination

2- if f is bounded on $[a,b]$ & if the Points of discontinuity of f on $[a,b]$ form a null set then $f \in L'[a,b]$ Def
True Theorem

3- A series of real numbers is absolutely convergent if and only if it can be expressed as the difference of two convergent series of positive real numbers. True Theorem Propsition
$|a_n| = a_n^+ + a_n^-$ $\sum a_n^+ , \sum a_n^-$ are convergent

4- Any countable set on the real line is null and so the rational numbers form a null set True Theorem

5- Any step function may be expressed as a finite linear combination of characterstic function of disjoint intervals
True Theorem

6- if S is a null set on R then there is an increasing squence $\{\varphi_n\}$ of step function for which the sequence $\{\varphi_n\}$ converges and such that $\{\varphi(x)\}$ diverges for every x in S. false
Almost every where $\{\varphi_n\}$ converge and the point fail to converge $\{\varphi_n\}$ in $X \in S$

7- Any increasing sequence $\{S_n\}$ of real numbers is convergent if and only if, it is bounded above. True
Axiom of Completness theorem

8- A Compact subset of R^k has finite measure True (Propsition Theorem)

9- Any countable set on the real line is null True Propsition Theorem

10- A ring is closed under taking the set operations $\cup . \cap . \setminus$.
True Defintion R let S, T be measurable sets, then so one $S \cup T . \cap . \setminus . \Delta$

Mostafa AbdelKarem

2022

May 2017

1- The lebesgue integral is a linear, Positive absolute operator on the linear space L'. True Definition

2- if f is Monotone an [a,b] then f is integrable an [a,b] True Theorem Corollary

3- All Continuous & all integrable functions are measurable True Theorem

4- مكرر

5- If S is a Measurable set and $M(S) = 0$ if and only if S' is null False $M(S)=0$ iff S is a null set

6- fatou's Lemma states that let f_n be a sequence of +ve measurable functions an E. if $f_n \to f$ in Measure on E, then $\int_E f \le \lim\inf_{n\to\infty} \int_E f_n$ True Theorem

Desha

7- مكرر

8- مكرر

9. By means of the Monotone Convergence theorem we can evaluate the integrals such as $\int_{-\infty}^{\infty} e^{-|x|}\, dx = \lim \int f_n = 2 = \int_0^1 x^{-1/2}\, dx$
True 2 Example in book Page 99 ساكانت يجي بروف

10- Assume A is a lebesgue measurable subset of R of finite measure and $\varphi(x) = |A \cap (-\infty, x]|$. Then φ is Continuous at each $x \in R$ True بركة ربنا هتعوض

Mostafa Abdel Kare

Desha 2022

Page: Date:

May 2019

1- A set function is a function whose range is a class of set

Domain false

2- Extended Real valued set function is a set function of range of Complex numbers and also could be $\pm\infty$

false Real

3- if μ is a measure on a ring R a set E in R is said to have finite measure if $\mu(E) \leq \infty$

false $\mu(E) < \infty$

4- The measure of E is σ-finite if there exists a sequence $\{E_n\}$ of sets in R such that $E \subset \bigcup_{n=1}^{\infty} E_n$ & $\mu[E_n] < \infty$, $n = 1, 2, \ldots$ True Definition

5- An extended real valued set function μ on a class G is not continuous from below at a set E (in G) if for every increasing sequence $\{E_n\}$ of sets in G for which $\lim_n E_n = E$, we have $\lim \mu_n(E_n) = \mu(E)$ false Continuous

6- A hereditary class is σ-ring iff it's not closed under the formation of countable unions false Closed

7- An outer measure μ^* is a set function from a hereditary σ ring H to the positive extended real values such that (negative) (Monotonic) and (Countable subadditive) false non-negative

8- let Σ be a σ- algebra over a set X and μ be a measure on Σ Then The inner measure μ induced by μ is defined by $\mu(T) = \inf \{\mu(S) : S \in \Sigma \text{ and } S \subseteq T\}$ sup false

9- if μ is σ- finite measure on a ring R, then there is a unique measure $\bar{\mu}$ on the σ-ring $S(R)$, such that for E in R, $\bar{\mu}(E) \neq \mu(E)$; the measure $\bar{\mu}$ is σ-finite $\bar{\mu}(E) = \mu(E)$ false

10- A set X is non-measurable set iff $\mu^*(X) > \mu_*(X)$; which means inner and outer measure of X are equal false

$\mu^*(X) > \mu_*(X)$ or $\mu^*(X) = \mu_*(X) = \infty$

Mostafa Abdelkarem Desha 2022

May 2019

2 ... ,5

11- A Measurable function is a function between two unMeasurable spaces such that the preimage of any Measurable set is measurable false Measurable

12- A sequence $\{f_n\}$ of a finite valued Measurable functions Converges in measure to the Measurable function f, if for every any $\varepsilon > 0$ $\lim_{n\to\infty} m(\{x : |f_n(x) - f(x)| \leq \varepsilon\}) = 0$ $\varepsilon > 0$

false $\geq, \varepsilon$

13- So long as there are non Measurable sets in a Measure space, there aren't non-Measurable functions from that space

are false

Dr

14- if m is a measure on a ring R, then m is Monotone or Subtractive True Theorem monotone & ring

15- Every set E in H(S) has a measurable Kernel

True Theorem

16- Every Countable set is a Borel set of measure zero

True Theorem

17- The measure of a singleton is zero

True Theorem Dr

18- let a closed set F be a subset of a bounded closed set G Then $m(F) \leq m(G)$

True Theorem Dr

19- ~~error~~ Repeated

20- if f is measurable and |f| is integrable, then f is integrable. True Propsition

Mostafa Abdelkareem

Basha

May 2018

1- if (X, A, M) is a measure space and $1 \leq p \leq \infty$ then $L^p(X)$ is a Banach space false $1 \leq p < \infty$

2- كرر

3-

4- if a +ve function has Lebesgue integral equal to zero then the function is zero a.e. ω True Theorem

5- The function $f(x) = \frac{1}{1+x^2}$ has supremum = max^m and infimum = min^m

false max = sup = 1 , min ≠ inf

6-9 كرر

10- The function $f : R^k \to R$ is measurable if the truncated function mid $\{-g, f, g\}$ is integrable for every positive integarable function g in $L^2(R^k)$ True Definition pg120

11-12- كرر

13- The smallest linear space containing L^{inc} is denoted by L^1 which is the set of all function of the from $f = g - h$ where $g, h \in L^{inc}$ and so L' is called the space of lebesgue integrable functions True Definition

14-15- كرر

16- The union and intersection of a countable number of measurable sets are measurable sets. True Theorem

17- كرر لما تيجي مروح ع

18- Any ring is a semi-ring True Theorem

19- The lebesgue measure of S $M(S) = \infty$ if X_s is not integrable True Definition Measure pg125

20- The rational numbers are countable set

True Theorem

Mostafa Abdelkarem

Reshu

Page: Date: Math

May 2018

1- let S, T be measurable sets then $M(S \cup T) + M(S \cap T)$
$= M(S) + M(T)$ True Theorem

2- Holder inequality let $p, q > 1$ satisfy the relation $\frac{1}{p} + \frac{1}{q} = 1$
if $f \in L^p$ and $g \in L^q$ then $fg \in L^1$ and $|fg| \leq \|f\|_p \|g\|_q$
True Theorem

3- L^1 has the property of Completeness of the real numbers
True fg 42

Desha

4- let $\{\varphi_n\}$ be a decreasing sequence of positive step functions converging a.e.w to zero then $\int \varphi_n \to 0$
True Theorem

5- The inner measure $M_*(E)$ of E is the least upper bound of measure of closed sets F contained in the set E:
$M_*(E) = \sup\{M(F) : F \subseteq E, F \text{ is closed}\}$ false
The set $F \subseteq E$ must be closed and bdd $\equiv$ Compact

6- If M is a measure on a مكرر

7- 8- مكرر

9- A measurable space is a set X and a σ-ring S of subsets of X with the property that $\cup S = X$
True Theorem

Desha

10- A measure space is a measurable space (X, S) and a measure M on S True Definition

11 is the space of lebesgue integrable function.

Desha

Mostafa Abdelhareem

2022

Page: Statistics   Date:

~~May~~ May 2017

Q1

1- d 2- d 3- a 4- c 5- d

6- d 7- d 8- a 9- d 10-

Q3 Repeated

May 2016

1- L^{inc} denotes the set of all function f where f is the limit almost every where of an increasing sequence of step function whose integrals are bounded.

True   Definition

2- The Monotone function f is continuous at the point p if and only if, $f(p-0) = f(p+0)$. True   Theorem

3- $m^*(E_1) - m^*(E_2) \leq 2m^*(E_1 \Delta E_2) + 2m^*(E_1 \cap E_2)$, where m^* is the lebesgue outer measure on R & $E_1, E_2 \subset R$

True

4- مكرر

5- مكرر

6- The symmetric difference of 2 sets is $A \Delta B = (A/B) \cup (B/A)$

True

7- 8- 9- 10- مكرر

فيهم 2 prove أنا عملت ليهم skip

عايزة اجتهاد وهاتاخد يا عم بجوج

Mostafa Abdelkarem

Desha

4/6/2022

May 2015

1- let $A \subset R$ be a lebesgue measurable set if $0 \leq b \leq m(A)$ then there is a lebesgue measurable set $B \subset A$ with $m(B) = b$

True

2- كرر

3- if $|A \cap I| \leq b|I|$ for all open intervals $I \subset R$ & $b < 1$, then $|A| = 0$

مش حالك صح

4- if $a|I| \leq |A \cap I|$ for all open intervals $I \subset R$ & $a > 0$ then $|A| = \infty$

مش حالك صح

5- كرر

6- A measurable map $T: X \to X$ on a measure space (X, A, m) is said to be measure preserving if $m(T^{-1}(A)) = m(A)$.

True

7- كرر

8- All closed sets in R^k are measurable True Theorem

9- كرر

10- كرر

Mostafa Abdelkarem

Desha

Desha Mansy

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قولوا لدى حدما هي م الماء ع يدعلينا بـ Tor f

هنشلوح يا كازنيما

Page: Date:

May 2021

1- The Axiom of Completeness assures that $\{(1+\frac{1}{n})^n\}$ Converges to a real number between 2 and 3

True Theorem

13- let $\{f_n\}$ be an increasing sequence of function in L^{inc} where integrals are bounded. Then $\{f_n\}$ Converges almost every where here to a function f, where f lies in L^{inc} and $\int f = \lim \int f_n$.

True Theorem

15- let $f: R^k \to R$ be the limit almost everywhere of a sequence of integrable function and suppose that $|f| \leq g$ for Positive integrable function g. Then f is integrable.

True Theorem

16- The product of two integrable function may not be integrable while the product of any two measurable function is measurable

True Theorem

19- If $f_n \to f$ almost everywhere and f_n is measurable for $n = 1, 2 \dots$ then f is measurable

True Theorem

17- All Continuous and all integrable function are measurable

True Theorem

Desha Mansy

Desha

mostafa Abdelkarem

Senior 2022

Desha Mansy