The Bodwad Sarvajanik Co-Op. Education Society Ltd., Bodwad

Arts, Commerce and Science College Bodwad

Question Bank

Class:-TYBSc **Sem:-VI**

Subject: Measure Theory **Paper Name:- MTH 601**

Sr. No.	Questions	Ans
01)	The outer measure of a non-empty set A is denoted by…… (A) $\underline{m}(A)$ (B) $\overline{m}A$ (C) $\dot{m}(A)$ (D) m(A)	**B**
02)	The inner measure of a non-empty set A is denoted by…… (A) $\underline{m}(A)$ (B) $\overline{m}(A)$ (C) m(A) (D) m(A)	**A**
03	If A=[2,3] and B=[0,4] then m(A)………m(B). The blank space is (A) $>$ (B) = (C) $<$ (D) None of the above	**C**
04)	If A_1 and A_2 are measurable subsets of [a,b] then $A_1 \cup A_2$ is ……. (A) Non measurable set (B) Measurable set (C) Integrable set (D) None of the above	**B**
05)	If A_1 and A_2 are measurable subsets of [a,b] then A_1-A_2 is …….. (A) Measurable set (B) Non Measurable set (C) Integrable set (D) None of the above	**A**
06)	If A_1 and A_2 are measurable subsets of [a,b] then $A_1 \cap A_2$ is …….. (A) Integrable set (B) Non Measurable set (C) Measurable set (D) None of the above	**C**
07)	If A_1 and A_2 are measurable subsets of [a,b] then $A_1 \triangle A_2$ is …….. (A) Measurable set (B) Non Measurable set (C) Integrable set (D) None of the above	**A**
08	A countable set is ……. (A) Finite non-Measurable set (B) Infinite Non-Measurable set (C) Non-measurable set (D) Measurable	**D**
09	If $\overline{m}(E) = 0$ then E is ………. (A) Measurable set (B) Non Measurable set (C) Integrable set (D) None of the above	A
10)	A set containing of one point is ………and its measure is ….. (A) Measurable,0 (B) Measurable ,1 (C) Non-measurable,0 (D) Non-measurable,1	A
11)	For any set A, _ m A x (A)............( ) + . Fill in the blanks. (A) $<$ (B) $>$ (C) $=$ (D) $\neq$	C
12)	Let A=N, the set of natural numbers then _ m(A). …… (A) ∞ (B) 0 (C) 1 (D) $-\infty$	B
13)	There exists an uncountable set of measure .The set is called ….. (A) Lebesgue set (B) Riemann set	C

	(C) Cantor set (D) Cauchy set	
14)	If f is a measurable function then |f| is …….. (A) Measurable function (B) Non-measurable function (C) Constant function (D) Modulus function	A
15)	If f is a measurable function then the set {x/f(x)=s} is ……. (A) Non-Measurable set (B) Measurable set (C) Equal set (D) None of the above	B
16)	If f_1 and f_2 are measurable functions then on [a,b] then $\frac{f_1}{f_2}$ is measurable on [a,b] provided that f_2 ……. (A) =0 (B) ∞ (C) $\neq 0$ (D) $-\infty$	C
17	If f_1 and f_2 are measurable functions then on [a,b] then $f_1 + f_2$ is ……… on [a,b] (A) Measurable function (B) Non-measurable function (C) Summable function (D) None of the above	A
18)	If f_1 and f_2 are measurable functions then on [a,b] then $f_1 - f_2$ is ……… on [a,b] (A) Non-Measurable function (B) Measurable function (C) Not defined (D) None of the above	B
19)	If f_1 and f_2 are measurable functions then on [a,b] then f_1 X f_2 is ……… on [a,b] (A) Measurable function (B) Non-measurable function (C) Not defined (D) None of the above	A
20)	If {f_n} is a sequence of measurable functions on [a,b] such that the sequence {f n(x)} is (A) Non-Measurable function (B) Measurable function (C) Not defined (D) None of the above	B
21)	If {f_n} is a sequence of measurable functions on [a,b] such that the sequence {$f_n(x)$} is bounded for each x in [a,b] then the function g(x)=g.l.b{f_1,f_2,……..} is …. (A) Measurable function (B) Non-Measurable function (C) Not defined (D) None of the above	A
22)	Every continuous function is ………. (A) Non-Measurable function (B) derivable (C) Measurable function (D) integrable	C
23)	F=g a.e. and f is measurable function then g is also measurable . A.E. stands for …. (A) All except (B) Almost everywhere (C) All early (D) All equal	B
24)	If P={A_1,A_2, ……A_n} such that $\bigcup_{i=1}^{n} A_1 = [a,b]$, then P is called …… of [a,b] (A) Partition (B) Separatione (C) Regularization (D) None of the above	A
25)	$\bigcup$[P,f] is called ………. (A) Upper Riemann sum (B) Upper Lebesgue sum (C) Lower Riemann sum (D) Lower Lebesgue sum	A

26)	L[P,f] is called .... (A) Upper Riemann sum (B) Upper Lebesgue sum (C) Lower Riemann sum (D) Lower Lebesgue sum	B
27)	$L\int_{\underline{a}}^{b} f dx$ is called (A) Lebesgue upper integral (B) Lebesgue lower integral (C) Riemann upper integral (D) Riemannlower integral	B
28)	$L\int_{a}^{b} f dx$ is called (A) Lebesgue upper integral (B) Lebesgue lower integral (C) Riemann upper integral (D) Riemann lower integral	A
29)	The necessary and sufficient condition for a bounded function to be Lebesgue integralble over [a, b] is U[P,f]-L[P,f].......... (A) $< \epsilon$ (B) $>\epsilon$ (C) $=\epsilon$ (D) None of the above	A
30)	If f(x)=1, if x is an irrartional number in [-4,4] and f(x)=-2 if if x is an rational number in [-4,4]. Calculate the lebesgue integral. (A) Does not exists (B) Not Lebesgue Integrable (C) 8 (D) 4	C
31)	If f(x)=1, if x is an irrartional number and f(x)=2 if if x is an rartional number .Calculate the lebesgue integral. (A) ∞ (B) 1 (C) 2 (D) 0	A
32)	$nf(x), 0 \leq f(x) \leq n = 0, f(x) > n$ is called .... function. (A) Bounded (B) Unbounded (C) Truncating (D) Real	C
33)	$\int_0^1 \frac{1}{x^{2/3}} dx = ...$ (A) -2 (B) 3 (C) Does not exists (D) None of the above	B
34	Let $f, g \in L[a,b]. p$ is defined as $p(f,g) = \|f-g\|_2$ is...... (A) Metric (B) Matrix (C) Pseudometric (D) PseudoMatrix	A
35)	A subset G = (3,4] of an interval [1,4] is_______ in[1,4] . (A) closed (B) open (C) neither open nor closed (D) either open or closed	B
36)	If A_1 and A_2 are measurable subsets of [a,b] ,then I. $A_1 \cup A_2$ is measurable. II. $A_1 \cap A_2$ is measurable. (A) Only (I) is true (B) Only (II) is true (C) Both (I) and (II) are true (D) Both (I) and (II) are false	C
37)	The Cantor set C , _______ (A) is countable (B) is uncountable (C) have measure 0 (D) Both (B) an(C)	D
38)	If P and Q are any two measurable partitions of [ ] a b, then_______ (A) $\cup [f; P] \leq L[f; Q]$ (B) $U[f; P] \geq L[f; Q]$ (C) Both (A) and (B) (D) Neither (A) nor (B)	B

39)	If E is a measurable subset of [a,b] then $\int_E\ 1 =$..... (A) 1 (B) –m(E) (C) -1 (D) m (E)	D
40)	If f(x)=log$(1/x)\ 0 < x \leq 1$ then$^2 f(x) =$.......for $\frac{1}{e^2} \leq x \leq 1$ (A) -2 (B) log(x) (C) log(1/x) (D) 2	**D**
41)	If G is an open subset of [a,b],G=∪ I_n, then the length $\lvert G\rvert$ of G is defined as where $\lvert I_n\rvert$ denotes the length of the interval I_n. (A) $\lvert G\rvert \leq \sum_n \lvert I_n\rvert$ (B) $\lvert G\rvert \geq \sum_n \lvert I_n\rvert$ (C) $\lvert G\rvert = \sum_n \lvert I_n\rvert$ (D) $\lvert G\rvert < \sum_n \lvert I_n\rvert$	**C**
42)	If G_1 and G_2 are open subsets of [a,b] , then _ (A) $\lvert G_1\rvert + \lvert G_2\rvert = \lvert G_1 \cup G_2\rvert - \lvert G_1 \cap G_2\rvert$ (B) $\lvert G_1\rvert + \lvert G_2\rvert = \lvert G_1 \cup G_2\rvert + \lvert G_1 \cap G_2\rvert$ (C) $\lvert G_1\rvert + \lvert G_2\rvert = \lvert G_1 \cup G_2\rvert$ (D) $\lvert G_1\rvert + \lvert G_2\rvert = \lvert G_1 \cup G_2\rvert \div \lvert G_1 \cap G_2\rvert$	**B**
44)	Let F be any closed subset of[a,b]. Then the length $\lvert F\rvert$ of F is defined as ________ where G is any open subset of [a,b] , such thatG ⊃ F . (A) $\lvert F\rvert = \lvert G\rvert + \lvert G + F\rvert$ (B) $\lvert F\rvert = \lvert G\rvert + \lvert G - F\rvert$ (C) $\lvert F\rvert = \lvert G\rvert - \lvert G + F\rvert$ (D) $\lvert F\rvert = \lvert G\rvert - \lvert G - F\rvert$	**D**
45)	For a bounded interval $I = [a, b]$ or (a,b] or [a,b) or (a,b), the length of interval l(I)=	**A**
46)	A subset G = (2,3] of an interval [ ] 1,3 is________ in[ ] 1,3 . (A) closed (B) open (C) neither open nor closed (D) either open or closed	**B**
47)	A subset F=$\left\{\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots\ldots\right\}$ of interval $[0,1]$ is in [0,1]. (A) closed (B) open (C) neither open nor closed (D) either open or closed	**A**
48)	If $E \subset [a, b]$ then the outer measure of E is denoted by________ (A) $\underline{m}E$ (B) $\lvert mE\rvert$ (C) $\lVert mE\rVert$ (D) $\overline{m}E$	**D**
49)	If $E \subset [a, b]$ then inner measure $\underline{m}E = l.u.b\lvert F\rvert$,where the e l u b . . .is taken over all ________ sets F contained in E . (A) open (B) closed (C) empty (D) universal	**B**
50)	If E a b ⊂ [ ] , then_________ (A) $\underline{m}E \geq \overline{m}E$ (B) $\underline{m}E - \overline{m}E = 0$ (C) $\underline{m}E \leq \overline{m}E$ (D) $\underline{m}E - \overline{m}E = \infty$	**C**