075/2024

Maximum: 100 marks

Time: 1 hour and 30 minutes

- 1. The principal features of the National Income Committee Report in 1954 were:
 - (1) During 1950 51, agriculture contributed nearly half of the national income.
 - (2) Mining, manufacturing, and handicrafts contributed about one-fourth of the national income.
 - (3) Commerce, transport, and communications accounted for a little more than one-sixth of the total national income.
 - (4) Other services such as professions and liberal arts, administrative services, domestic services, and house property accounted for about 15 percent of national income.

Choose the correct statements:

- (A) All the above (1), (2), (3) and (4)
- (B) (1), (2) and (3) only
- (C) (1), (3) and (4) only
- (D) (2), (3) and (4) only
- 2. Given below two statements, one is labelled as Assertion [A] and the other as Reason [R].

Assertion [A]: Devaluation is known as the Expenditure switching measure.

Reason [R]: Devaluation encourages the switching of expenditure between foreign and domestic goods.

Select the correct answer from the codes given below:

- (A) Both [A] and [R] are true and [R] is the correct explanation of [A]
- (B) Both [A] and [R] are true and [R] is not the correct explanation of [A]
- (C) [A] is true and [R] is false
- (D) [A] is false and [R] is true
- **3.** The main features of the Employment Guarantee Act, 2005:
 - (1) Every household in rural India will have a right to at least 100 days of guaranteed employment every year for at least one adult member.
 - (2) Work should be given within 30 days of demanding it, and the work should be located within a 5-kilometer distance.
 - (3) 5% of wages may be deducted as contributions to welfare schemes like health insurance, accident insurance, etc.
 - (4) The Grama Sabha will monitor the work of the Grama Panchayat by way of a social audit.

Choose the correct statements:

(A) (1), (2) and (3) only

(B) (2), (3) and (4) only

(C) (1), (3) and (4) only

(D) All the above

A

4.	Which is/are not true in connection with the Fourth Industrial Revolution? (1) Focused on automation of single machine and process							
	(2)	Digitisation of product and service offerings						
	(3)							
	(4)		ng together technology forces mented Reality, robotics, etc	such as IoT,	cloud computing, big data analytics,			
		(A)	(1) only	(B)	(1), (2) and (3) only			
		(C)	(3) only	(D)	(1) and (3) only			
5 .	If th	ie Mai	ginal Opportunity Cost (MOC)	is constant, the	e Production Possibility Curve will be :			
		(A)	Backward bending	(B)	Convex to the Origin			
		(C)	Concave to the Origin	(D)	None of the above			
6.	Onc	e the	need for policy change is reco	gnized, the go	vernment has to evaluate the possible			
	alte	rnativ	ve policies. It is termed as:					
		(A)	Recognition lag	(B)	Impact lag			
		(C)	Decision lag	(D)	Implementation lag			
7.	Given below two statements, one is labelled as Assertion [A] and the other as Reason [R].							
	Assertion [A]: Externalities can be a source of economic inefficiency							
	Reason [R]: Externalities are not reflected in market prices.							
	Sele	ct the	e correct answer from the codes	given below:				
		(A)	Both [A] and [R] are true and	l [R] is not the	correct explanation of [A]			
		(B)	[A] is true and [R] is false					
		(C)	Both [A] and [R] are true and	l [R] is the cor	rect explanation of [A]			
		(D)	[A] is false and [R] is true					
8.	The Objectives of the FRBM Act. 2003:							
	(1)	To i	ntroduce transparent fiscal ma	nagement syst	tems in the country.			
	(2)	To i	ntroduce a more equitable and	d manageable	distribution of the country's debts over			
		the years.						
	(3)	3) To aim for fiscal stability for India in the long run.						
	(4)	То я	give necessary flexibility to the	ne Reserve Ba	nk of India for managing inflation in			
		Indi	a.					
		(A)	(4) only	(B)	(1), (2) and (3) only			
		(C)	(1) and (4) only	(D)	All the above			
 -	10.6.2							

9.	Which is/are not the cultural services provided by the ecosystem for human well-being?						
	(1)	Clin	nate regulation				
	(2)	Edu	cation and inspiration				
	(3)	Recr	reation and aesthetic values				
	(4)	Fres	sh Water				
		(A)	(1) and (4) only	(B)	(1), (2) and (4) only		
		(C)	(4) only	(D)	(2) and (3) only		
10.	Whi	ch sta	atement/s is / are not related to Green	n GDP?			
	(1)	(1) Green GDP (GGDP) incorporates quantifying the economic value of natural resources and ecosystems.					
	(2)		OP doesn't allow policymakers to bet wth and environmental sustainability		rstand the trade-offs between economic		
	(3)	GGI	OP helps policy makers prioritize and	l allocate	e resources effectively.		
	(4) GGDP highlights the depletion of natural resources and encourages their susta management.						
		(A)	(1) only	(B)	(2) only		
		(C)	(2) and (3) only	(D)	(1), (3) and (4) only		
11.	Choose the true assumption about classical linear regression model:						
	(i)						
	(ii)	_	standard error measures the precision	on of the	estimate		
	(iii)						
		(A)	Only (i) and (ii)	(B)	Only (ii) and (iii)		
		(C)	Only (i) and (iii)	(D)	All of the above (i), (ii) and (iii)		
12.	The fitted regression equation $\hat{Y}_i = -10 + 0.6 X$						
	Find the value of the residual at the point $X_i = 60$ and $Y_i = 50$						
		(A)	24	(B)	26		
		(C)	-26	(D)	30		
13.	Which of the following properties are true about r^2 ?						
	(i)	Non	-negative number				
	(ii)	i) Explains proportional variation in a model					
	(iii)	A m	easure of strength of relationship be	tween de	ependent and independent variable		
		(A)	Only (i) and (ii)	(B)	Only (ii) and (iii)		
		(C)	Only (i) and (iii)	(D)	All of the above (i), (ii) and (iii)		
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14.	Pick	Pick out the wrong statement as an outcome of multicollinearity from the given options:						
	(i)	Standard error of the explained variation is high						
	(ii)	No c	correlation between explanatory variable	es				
	(iii)	It is	a feature of population					
		(A)	Only (i) and (iii)	(B)	Only (i) and (ii)			
		(C)	Only (ii) and (iii)	(D)	All the above (i), (ii) and (iii)			
15.	Whi	ch of	the given options are not the assumption	ns of	Durbin -Watson statistic?			
	(i)	Regi	ression model includes the intercept ter	m				
	(ii)	No r	nissing observations in the data					
	(iii)	Erro	or term (u _i) is normally distributed					
	(iv)	Exp	lanatory variables are stochastic					
		(A)	(i)	(B)	(ii)			
		(C)	(iii)	(D)	(iv)			
16.	If a	qualit	ative variable has 3 categories, we can	intro	duce :			
	(i)	1 du	mmy variable					
	(ii)	2 du	mmy variables					
	(iii)	3 du	mmy variables					
	(iv)	4 du	mmy variables					
		(A)	(i)	(B)	(ii)			
		(C)	(iii)	(D)	(iv)			
17.	In A	NCO	VA model, the regressors are :					
	(i)	Only	y quantitative variables					
	(ii)	Both	quantitative and nominal variables					
	(iii)	Only	y qualitative variables					
	(iv)	Both	n quantitative and qualitative variables	}				
		(A)	(i)	(B)	(ii)			
		(C)	(iii)	(D)	(iv)			
18.	Cho	ose th	e wrong the statement given about stat	ionar	ity of time series :			
	(i)	Dick	y-Fuller test statistics tests the station	arity	of time series.			
	(ii)	Wea	k stationarity occurs when mean, varia	nce a	nd covariance are constant over time			
	(iii)	Ran	dom walk without drift is a stationary s	stocha	astic process			
	(iv)	Non	e of these					
		(A)	(i)	(B)	(ii)			
		(C)	(iii)	(D)	(iv)			

19.	Whi	ch of	the following statements are true abo	ut Box-	Jenkins Approach?		
	(i)	It h	andles stationary as well as non-statio	onary ti	me series		
	(ii)	Helı	pful for forecasting				
	(iii)	Test	ts whether the residuals estimated fro	m the r	model are white noise.		
		(A)	(i) and (ii)	(B)	(ii) and (iii)		
		(C)	All of the above (i), (ii) and (iii)	(D)	(i) and (iii)		
20.	Whi	ch of	the following statements are true abo	ut pane	el data?		
	(i)	It is	collected at one point of time				
	(ii)	The	same-cross sectional units are survey	ed over	a period of time		
	(iii)	If ea	ach entity has different number of obs	ervatio	ns, we have unbalanced panel		
		(A)	Only (i) and (ii)	(B)	Only (ii) and (iii)		
		(C)	Only (i) and (iii)	(D)	Only (iii)		
21.	To v	vhich	country did India export the larges	st share	e of its total exports in the 2022-2023		
	financial year?						
		(A)	China	(B)	United states		
		(C)	Netherland	(D)	Saudi Arabia		
22.	Wha	t is t	he ratio of Indian General Governmer	ıt's debt	t to GDP in the 2022-23 financial year?		
		(A)	84.5%	(B)	45.9%		
		(C)	97.3%	(D)	64.5%		
23.	Which demographic group in India typically faces the highest educated unemployment rate?						
		(A)	Rural Male	(B)	Rural female		
		(C)	Urban male	(D)	Urban female		
24.	Which of the following represents the total money value of all goods and services produced in						
	an economy in an accounting year?						
		(A)	Net National Product (NNP)	(B)	National Income (NI)		
		(C)	Gross National Product (GNP)	(D)	Gross Domestic Product (GDP)		
25 .	Suppose in a country, the nominal GDP for the year 2020 is Rs.10,000 and the real GDP						
	(adjusted for inflation) for the same year is Rs.9,000. Then the value of GDP deflator is						
		(A)	90	(B)	100		
		(C)	111.11	(D)	124.98		
26.	Whi	ch sec	ctor attracted the highest Foreign Dir	ect Inv	estment (FDI) inflows into India in the		
	last	fiscal	year?				
		(A)	Computer Software and Hardware	(B)	Telecommunication		
		(C)	Drugs and Pharmaceuticals	(D)	Trading		

27. According to the SDG India Index 2020, which Indian state ranked first in development achievement?			ian state ranked first in sustainable	
	(A)	Tamil Nadu	(B)	Karnataka
	(C)	Kerala	(D)	Andhra Pradesh
28.	` ,	ating the Sustainable Developmen	` ,	DG) India index, how many goals are
	(A)	5	(B)	17
	(C)	30	(D)	3
29.		United Nations Sustainable Derries, what was India's rank?	evelopment	Goals (SDG) Index -2023, out of
	(A)	$115^{ m th}$	(B)	$117^{ m th}$
	(C)	$120^{ m th}$	(D)	112 nd
30.	Which is	the current base year used for esti	mating nat	ional income in India as of 2023?
	(A)	2004-05	(B)	2015-16
	(C)	2011-12	(D)	2018-19
31.	Whose th	eory affirms that humans have	three motiv	vational drivers regardless of age and
	(A)	Maslow	(B)	Herzberg
	(C)	Vrooms	(D)	Mc Clelland
32.	Which am	nong the following is not a Quality	manageme	nt tool?
	(A)	Pareto Chart	(B)	Histogram
	(C)	Scatter diagram	(D)	Qlik
33.	A transac	tion that involves an increase in c	urrent ratio	but no change in working capital:
	(A)	Purchase of goods on credit		
	(B)	Cash payment of non current lia	bilities	
	(C)	Payment to trade creditors		
	(D)	Sale of fixed assets for cash		
34.	Du Pont f	ormula was developed by :		
	(A)	Alfred Porter	(B)	Donaldson Brown
	(C)	James Du Pont	(D)	F.W. Taylor
35 .	Α	—— hypothesis is one which is at	low level of	f abstraction.
	(A)	Refined hypothesis	(B)	Null hypothesis
	(C)	Crude hypothesis	(D)	Descriptive hypothesis
36.	Longitudi	nal Research approach deals with	:	
	(A)	Long term Research	(B)	Horizontal Research
	(C)	Short term Research	(D)	Descriptive Research

37.	Type	e I err	cor occurs when			
		(A)	Null hypothesis gets accepted even	if false		
		(B)	Null hypothesis gets rejected even i	f it is tr	ue	
		(C)	Both Alternate and Null hypothese	s are rej	ected	
		(D)	None of the above			
38.		e fiel oted is		contains	variety of items, the sampling method	
		(A)	Systematic sampling	(B)	Stratified sampling	
		(C)	Snowball sampling	(D)	None of the above	
39.	Whi	ch of	the following statements is/are true r	egardin	g ARR method?	
	(i)	It is	based on cash flows generated by a p	oroject.		
	(ii)		oes not differentiate between investi ime of the project.	ments tl	hat yield different cash flows over the	
	(iii)	It ig	nores time value of money			
		(A)	(i), (ii) and (iii)	(B)	(i) and (ii) only	
		(C)	(i) only	(D)	(iii) only	
40.			— is commonly referred to as index i	nvesting	ŗ.	
		(A)	Active Portfolio management	(B)	Passive Portfolio management	
		(C)	Indexed Portfolio management	(D)	Integrative Portfolio management	
41.	The	key fa	actor that distinguishes project mana	gement	from just 'management' is that it:	
		(A)	Is an ongoing process	(B)	Has a finite time span	
		(C)	Needs professional skills	(D)	Requires effective team work	
42.	Which among the following is a type of project audit?					
		(A)	Performance audit	(B)	Compliance audit	
		(C)	Financial audit	(D)	All of the above	
43.			— causes Over capitalisation.			
	(i)	Rais	sing higher amount through issue of s	shares o	r debentures than company needs.	
	(ii)	Prov	vision for depreciation is not made pr	operly.		
	(iii)		ge payment for the acquisition of fi chase goodwill etc.	ctitious	assets like high payment is made to	
		(A)	(i) and (iii)	(B)	(iii) only	
		(C)	(i), (ii) and (iii)	(D)	(i) only	

44.	wnich of	t the following statements are tri	ie regarding C	JAPM!			
	(i) It e	establishes relationship between	risk and aver	age rate of return.			
	(ii) Beta is a measure of a security's risk relative to the risk of market portfolio.						
	(iii) Th	e value of Beta measures both sy	stematic and	unsystematic risks of a security.			
	(A)	(i) and (ii)	(B)	(ii) only			
	(C)	(iii) only	(D)	(i), (ii) and (iii)			
45.	WACC fo	or a given firm is the:					
	(A)	Discount rate a firm applies of	n projects				
	(B)			cts undertaken			
	(C)	Rate of interest on the next bo	ond issue				
	(D)	Blended cost of capital of com	mon shares, p	referred stock, and debt			
46.		nework introduced by SEBI mand nformation is :	dating certain	listed companies to disclose their ESG			
	(A)	TCFD	(B)	BRSR			
	(C)	SASB	(D)	CDP			
47.	The scale that reports the ranking of the data without actually establishing the degree of variation between them:						
	(A)	Nominal scale	(B)	Ordinal scale			
	(C)	Interval scale	(D)	Ratio scale			
48.	In ———— Research design method, researchers manipulate one or more independent variables and measure their effects on dependent variables:						
	(A)		(B)	Case study			
	(C)	Experimental	(D)	Cross sectional			
49.	In order	to achieve construct validity in n	neasurement,	which of the following is necessary:			
	(A)	Face validity	(B)	Content validity			
	(C)	Criterion validity	(D)	All of the above			
50.	Compara	ative statements are also known	as:				
	(A)	Dynamic analysis	(B)	Horizontal analysis			
	(C)	Vertical analysis	(D)	External analysis			
51.	Let A an	d B be two events with $P(A) > 0$,	$P(B \mid A) = 0.4$	and $P(A \cap B^c) = 0.2$. Then $P(A)$ is:			
	(A)	1/2	(B)	1/3			
	(C)	1/4	(D)	1/5			
52 .		and Y be two independent randor and 4 , respectively. Then $P(X < Y)$	\ .	llowing exponential distributions with			
	(A)		(B)	3/4			
	(C)		(D)	1/4			
	(0)	· · · · · · · · · · · · · · · · · · ·	(12)				

	(C)	Complex conjugate of $\varphi(t)$	(D)	$\varphi^2\left(t ight)$	
54.	Let $\{X_n\}$	be a sequence of independent ra	andom varia	bles with $P(X_n = \pm n^{\alpha}) = 1/2$. The value	
	of $lpha$ for which $\{X_n\}$ satisfies strong law of large numbers is :				
	(A)	3/4	(B)	1/2	
	(C)	1/3	(D)	2/3	
55.	Let (X_1, X_2)	$\left(X_{2} ight)$ have a bivariate normal $\left(X_{2} ight)$	distribution	with parameters $\mu_1 = 1, \mu_2 = 0, \sigma_1^2 = 1,$	
	$\sigma_2^2 = 4$ an	d $\rho = 1/2$. Then $P(X_2 > 1 X_1 = 2)$	is:		
	(A)	1/2	(B)	1/3	
	(C)	2/3	(D)	3/4	
56.	From a po	opulation of size 30, a systematic	e sample of s	ize 5 is drawn. If the first selected unit	
	is 4, then	the other units will be:			
	(A)	9, 14, 19, 24		8, 12, 16, 22	
	(C)	10, 16, 22, 28	(D)	9, 13, 17,21	
57.	7. Suppose there is a population consisting of 40 units. A sample of size 7 is to be taken from the population using simple random sampling (SRS). Then, the ratio of the variances of sample mean in SRS with replacement and SRS without replacement is:				
	(A)	10/13	(B)	13/11	
	(C)	10/11	(D)	13/10	
58.				(40, 30, 50) having variances (1,2,3). A proportional allocation. Let n_1, n_2, n_3 be	
				cata. Then, the values of n_1 , n_2 , n_3 are	
	respective				
	(A)	4, 3, 5	(B)	2, 4, 6	
	(C)	3, 4, 5	(D)	4, 4, 4	
59.	and treat	_		atments, the sum of squares for blocks total sum of squares is 500, then the	
	(A)	9	(B)	6	
	(C)	4	(D)	8	
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If $\varphi(t)$ is a characteristic function, then which of the following is not a characteristic

(B) Imaginary part of $\varphi(t)$

function:

(A) Real part of $\varphi(t)$

60.	In a 2^2 factorial experiment with factors A and B conducted in 3 replicates, the total yields of the treatment combinations $a_0 b_0$, $a_1 b_0$, $a_0 b_1$ and $a_1 b_1$ are 12, 14, 20, and 28, respectively.						
		sum of squares for the interaction AB					
	(A)	4	(B)	6			
	(C)	5	(D)	3			
61.				2). Then the value of k for which the			
	estimator	$k\sum_{i=1}^{4} X_i $ is an unbiased estimator of ϵ	τis:				
	(A)	$\sqrt{\frac{2}{3\pi}}$ $\sqrt{\frac{24}{\pi}}$	(B)	$\sqrt{\frac{\pi}{24}}$ $\sqrt{\frac{\pi}{32}}$			
	(C)	$\sqrt{rac{24}{\pi}}$	(D)	$\sqrt{\frac{\pi}{32}}$			
62 .	Let X be a	a random variable with p.d.f. $f(x)=1$	$-\theta + 2\theta x$	α ; $0 < x < 1, -1 \le \theta \le 1$. Based on a sample			
	of size on	e, the most powerful critical region f	or testi	ing $H_0: \theta=0$ against $H_1: \theta=1$ at level			
	$\alpha = 0.1$ is	:					
	(A)	x > 0.75	(B)	x > 0.9			
	(C)	x > 0.8	(D)	$x \le 0.75$			
63.	second se average	mesters are noted down. To test th	e hypo t class	a class. Their marks in the first and thesis that there is no change in the s against the hypothesis that it has			
	(A)	Z-test		Paired t-test			
	(C)	Two sample independent t -test		χ^2 -test			
64.	Which of	the following is not an assumption for	simple	linear regression?			
	(A)	Multicollinearity	(B)	Constant variance			
	(C)	Linear relationship	(D)	Normally distributed residuals			
65.	In a mult	tiple regression model $y = \beta_0 + \beta_1 x_1 +$	$\beta_2 x_2 +$	$\beta_3 x_3 + \varepsilon$, MSE = 20, $n=54$, and SST			
	(total) = 4	000. What is the R^2 of the regression	model	?			
	(A)	0.25	(B)	0.50			
	(C)	0.75	(D)	0.90			
66.	Which one	e of the following is a subspace of \mathbb{R}^{3} ?					
	(A)	$\{(1,b,1) \mid b \in \mathbb{R}\}$	(B)	$\{(a,1,1) a\in\mathbb{R}\}$			
	(C)	$\{(a, b, c) a+b+c=1\}$	(D)	$\{(0,b,0) b\in\mathbb{R}\}$			

- Which of the following statements is false? 67.
 - Similar matrices have the same characteristic polynomial
 - The matrix $A = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ has no characteristic value in \mathbb{R} .
 - The matrix $A = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ has no characteristic value in \mathbb{C} .
 - (D) None of the above
- **68.** The standard matrix for the reflection about the *xy*-plane in \mathbb{R}^3 is :

(A)
$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

(B)
$$\begin{bmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

(C)
$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

(D)
$$\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

- Which one of the following statements is false? 69.
 - For any group G and G', there is always at least one homomorphism $\phi:G\to G'$
 - A group homomorphism $\phi:G\to G'$ is a one-to-one map if and only if $Ker(\phi) = \{e\}, e \text{ is the identity element of } G$
 - If $\phi: G \to G'$ is a group homomorphism, then $Ker(\phi)$ is a normal subgroup of G (C)
 - Every homomorphism is a one-to-one map
- The orbits of the permutation $\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 3 & 8 & 6 & 7 & 4 & 1 & 5 & 2 \end{pmatrix}$ are: **70.**

(A)
$$\{1,3,6\}, \{2,8\}, \{4,5,7\}$$

(C)
$$\{1,4,5\},\{2,8\},\{3,6,7\}$$

(D)
$$\{1, 3, 6\}, \{4, 5\}, \{2, 8, 7\}$$

Which of the following intervals represent $C = \{x \in \mathbb{R} : \frac{2x+1}{x+2} < 1\}$? 71.

(A)
$$(-1,2)$$

(B)
$$(-2,1)$$

(C)
$$(-2,-1)$$

(D)
$$(-1,1)$$

72. Which of the following sets is not denumerable?

(A)
$$\mathbb{N} \times \mathbb{N}$$

(B)
$$E = \{2n : n \in \mathbb{N}\}$$

(C)
$$[0,1]$$

- 73. Let $f:[a,b] \to \mathbb{R}$. Then f need not be Riemann integrable on [a,b] if:
 - (A) f is a step function
 - (B) f is a continuous function on [a, b]
 - (C) f is monotone on [a, b]
 - (D) None of the above
- **74.** The Maclaurin series expansion of $f(z) = \frac{1}{(1-z)^2}$ is:
 - $(A) \quad \sum_{k=1}^{\infty} kz^{k-1}$

(B) $\sum_{k=1}^{\infty} kz^{k+1}$

(C) $\sum_{k=1}^{\infty} z^k$

- (D) $\sum_{k=1}^{\infty} kz^k$
- **75.** The residue of the function $f(z) = \frac{1}{(z-1)^2(z-3)}$ at z=1 is:
 - (A) $\frac{1}{4}$

(B) $-\frac{1}{4}$

(C) $\frac{3}{4}$

- (D) $-\frac{3}{4}$
- **76.** What is the indicial equation of the differential equation $2x^2y'' + x(2x+1)y' y = 0$?
 - (A) $m(m-1) + \frac{1}{2}m \frac{1}{2}$

(B) $m(m+1)+\frac{1}{2}m-\frac{1}{2}$

(C) $m(m-1)-\frac{1}{2}m-\frac{1}{2}$

- (D) $m(m-1)+\frac{1}{2}m+\frac{1}{2}$
- 77. What is the general solution of the differential equation $\frac{1}{y}dx \frac{x}{y^2}dy = 0$?
 - (A) xy = c

(B) $\frac{x}{y} = c$

(C) $x^2 y = c$

- (D) $(xy)^2 = c$
- **78.** Which of the following statements is false for the function f(x,y)=xy?
 - (A) Satisfies a Lipschitz condition on any rectangle $a \le x \le b$ and $c \le y \le d$
 - (B) Satisfies a Lipschitz condition on any strip $a \le x \le b$ and $-\infty < y < \infty$
 - (C) Does not satisfy a Lipschitz condition on the entire plane
 - (D) None of the above

79. What is the complete integral of the first order partial differential equation $(u_x + u_y)(u - xu_x - yu_y) = 1$?

(A)
$$u = ax + by + \frac{1}{a+b}$$

(B)
$$u=ax-by+\frac{1}{a+b}$$

(C)
$$u=ax-by-\frac{1}{a+b}$$

(D) None of the above

80. What is the solution of the partial differential equation $u_x + u_y = 2$ subject to the initial condition $u(x, 0) = x^2$?

(A)
$$u(x,y)=4y+(x-y)^2$$

(B)
$$u(x,y)=y+(x-y)^3$$

(C)
$$u(x,y)=2y+(x-y)^2$$

(D)
$$u(x,y)=2y^2+(x-y)^2$$

- **81.** Which of the following statements is true for a discrete topology?
 - (A) Every point is an accumulation point of any set
 - (B) No point is an accumulation point of any set
 - (C) Number of accumulation points depend on the cardinality of the set
 - (D) None of the above
- **82.** Which of the following is an example of a totally disconnected space?
 - (A) \mathbb{R} with usual topology
- (B) \mathbb{R} with semi-open interval topology
- (C) \mathbb{R} with cofinite topology
- (D) None of the above
- **83.** Which of the following statements in false?
 - (A) Every path-connected space is connected
 - (B) Subsets of the real line \mathbb{R} are connected if and only if they are path-connected
 - (C) Topologist's sine curve is path-connected
 - (D) None of the above
- 84. Let X and Y be normed spaces and $F:X\to Y$ be a linear map. Which of the following statements is not equivalent to the statement 'F is continuous on X'?
 - (A) F is continuous at 0
 - (B) F is uniformly continuous on X
 - (C) $||F(x)|| \le \alpha ||x||$ for all $x \in X$ and some $\alpha > 0$
 - (D) None of the above

	(A)	The vector space \mathbb{R} over \mathbb{R} under	er the norm	x = x
	(B)		$,b] \rightarrow \mathbb{R} \mid f \text{ is}$	a continuous function} over $\mathbb R$ under
		the norm $ f = \max_{x \in [a, b]} f(x) $.		
	(C)	The vector space $C[0,1] = \{f:[0,1]\}$	$1] \to \mathbb{R} \mid f \text{ is}$	a continuous function} over $\mathbb R$ under
		the norm $ f = \int_0^1 f(t) dt$		
	(D)	The vector space $\mathbb{C}^{\mathbf{n}} = \{x_1, x_2, \dots, x_n\}$	$x_n \mid x_i \in \mathbb{C}$	over \mathbb{C} under the norm $ x = \sum_{i=1}^{n} x_i ^2$
86.	NSS 79th	round is earmarked for :		
	(A)	Collection of data on 'Domestic '	Tourism Ex	penditure' and 'Multiple Indicators'
	(B)	-		number of SDG indicators through a CAMS)" along with a survey AYUSH
	(C)	Collection of data on 'Land and Assessment of Agricultural Hou		Holdings of Households and Situation d'Debt and investment'
	(D)	All the above		
87.	The head	quarters of Survey Design and Re	search Divi	sion (SDRD) of NSSO located at :
	(A)	Kolkata	(B)	New Delhi
	(C)	Faridabad	(D)	Bangalore
88.		_		der EARAS Scheme, Department of cutting experiments of
	crops for t	the estimation of production and y	yield rate of	crops.
	(A)	10	(B)	19
	(C)	9	(D)	14
89.	The list of	f all sampling units in the populat	tion is	
	(A)	Sampling design	(B)	Sampling frame
	(C)	Population	(D)	Sample
90.	The desig	n generally adopted for carrying o	out General	Crop Estimation Surveys (GCES):
	(A)	Cluster sampling		
	(B)	Simple random sampling		
	(C)	Multiphase sampling		
	(D)	Stratified multi-stage random sa	ampling des	sign
075	/9094		16	A
019	/2024		10	\mathbf{A}

85. Which one of the following normed space is not a Banach space?

- **91.** If a statistic t follows student's t-distribution with n d.f., then t² follows:
 - (A) χ^2 distribution with n d.f.
- (B) T distribution with $n^2 d.f$.
- (C) Standard normal distribution
- (D) F distribution with (l, n)d.f

- **92.** Level of significance refers to:
 - (A) Probability of non sampling error
 - (B) Probability of Type II error
 - (C) Probability of Type I error
 - (D) None of these
- **93.** Mann-Whitney U test is used to test:
 - (A) The quality of means of two independent population
 - (B) Equality of variances of two independent populations
 - (C) Equality of medians of two independent populations
 - (D) To test the randomness
- **94.** Consider the following statements:
 - (i) Principal components analysis is a data reduction technique
 - (ii) Principal components are Un correlated
 - (iii) Variances of principal components are equal to eigen values of variance covariance matrix
 - (iv) Principal components are unobservable

Then

- (A) Only (i) is true
- (B) Only (i), (ii) and (iii) are true
- (C) Only (i) and (ii) are true
- (D) All are true
- **95.** χ^2 test is used :
 - (i) To test the hypothetical value single of population variance
 - (ii) To test goodness of fit
 - (iii) To test equality of more than two means
 - (iv) To test the equality of three or more population variances

Then

- (A) Only (i), (ii), (iv) is correct
- (B) Only (i), (ii), (iii) is correct
- (C) Only (i), (iii), (iv) is correct
- (D) All are correct

96.	Consider the following statements:							
	(i)	R is	a free and open source softv	vare				
	(ii)	R is	a programming language fo	r statistical comp	outing and data visualization			
	(iii)	iii) Key feature of R was that its syntax is very similar to S						
	(iv)	R is	licensed by the GNU Projec	t and available u	nder the GNU General Public License			
	(v)	R ru	ns only on Windows comput	ting platform and	l operating system			
	Thei	n						
		(A)	Only (v) is correct					
		(B)	Only (i) and (iv) are correc	t				
		(C)	Only (i), (ii) and (iv) are co	rrect				
		(D)	Only (i), (ii), (iii) and (iv) a	re correct				
97.	The	follov	ving commands are entered	in R :				
	data	<- da	ata.frame(x=1:3, y=2:4, z=8:	10)				
	data [, - c(1,3)]							
	The	n the	output will be					
		(A)	[1] 2 3 4	(B)	[1] 8 9 10			
		(C)	[1] 1 2 3	(D)	None of these			
98.	The R command $t.\text{test}(y_1, y_2)$, where y_1 and y_2 are numeric vectors is used for :							
		(A)	Paired t test between y_1 a	nd y_2				
		(B)	Independent sample t test	between y_1 and	${\cal Y}_2$			
		(C)	Single sample t test for y_1	and y_2				
		(D)	None of these					
99.	Which of the following is not a valid function in MS Excel?							
		(A)	AVERAGE()					
		(B)	PRODUCT()					
		(C)	COUNTA()					
		(D)	MEAN()					
100.			cel to add numerical values used is :	s in column A, fro	om rows A10 to A20, the formulae that			
		(A)	SUM $(A10, A20)$	(B)	TOTAL $(A10, A20)$			
		(C)	SUM (A10: A20)	(D)	TOTAL (A10: A20)			

SPACE FOR ROUGH WORK

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