2025

COMMERCE

Paper : GE-404

[Business Research Methods (BRM)]

Full Marks : 40

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Module - I

Answer ***any two*** questions.

1. (a) What role does the literature review play in exploring a research problem?

(b) What are the key characteristics of a well-formulated research problem in business research? 5+5

2. (a) What are the fundamental ethical principles guiding business research?

(b) "Conclusive research is typically more formal and structured than exploratory research." — In this context, mention any five differences between Exploratory and Conclusive Research. 5+5

3. Identify, based on the sources of data collection, whether the undermentioned studies shall be utilising primary data or secondary data and specify an appropriate sampling frame in each of the following cases : 2×5

(a) A survey is conducted among Bengali working women of Kolkata city who are financially well-literate to understand whether they prefer physical possession of gold, like gold ornaments, gold jewelleries and guinea coins or in digital asset form like sovereign gold bonds, gold exchange traded funds, gold-commodity derivative contracts.

(b) An economist is evaluating the overvaluation/ undervaluation of the stock market capitalisation in comparison to the GDP of a nation. In this regard, she obtained stock market capitalization of ten major economies along with the size of their GDPs and then she self-computed the ratio of Market Cap to GDP of such economies to draw conclusion.

(c) An HR manager is carrying out a study to understand whether higher salary package can retain talent and cut down the high attrition rate among the ITES employees of her organisation. She computed the average annual pay data for each grade of such employees and then attempted to find an association between the salary growth rates with the respective attrition rates during the last five years.

(d) A financial analyst is studying the amount of capital generated through fresh issues in the Indian capital market during pre-covid era vis-a-vis capital generated during post-covid period in terms of average issue size per issuer for a study period spanning ten years.

(e) An MBA institute in the national capital region of India is assessing the overall satisfaction level of the passed-out graduates in terms of campus placement services being offered by their training and placement cell. Feedback is obtained in this regard by the institution from all successfully qualified graduates for the current academic batch regarding the behaviour of the placement team, support being provided during placement, average pay package and the number of jobs being offered to each of them.

4. (a) Briefly explain the concept of measurement error with reference to 'True score model'. Elaborate any three potential sources of error in measurement.

(b) How many paired comparison is possible for five different smartphone brands?

(c) As a social science researcher, you have received a result of Cronbach's Alpha as 0.48 and 0.83. How will you interpret the results? (3+3)+2+2

Module - II

Answer ***any two*** questions.

5. (a) The following is the marks of 40 respondents :

22	27	28	29	29	70	71	71	72
73	73	74	74	74	75	75	75	76
77	78	78	78	79	81	81	82	85
85	85	90	90	91	91	91	92	94
95	95	95	99					

The mean mark is 75.

You are required to answer the following questions :

(i) Identify the mild and extreme outliers, if any.

(ii) Is the data set positively skewed, negatively skewed or symmetrical? Give a reason.

(iii) In this kind of data set, which is the best measure of central tendency?

(b) The following output has been obtained from a data set using SPSS :

	Shapiro-Wilk		
	Statistic	df	Sig.
calories of energy drinks	.771	30	.000

Answer the following questions :

(i) Why does a researcher perform the above mentioned test?

(ii) What is the hypothesis of the test?

(iii) Interpret the test result.

(iv) How will the test result help a researcher to take research decision? (3+2+1)+(1+1+1+1)

6. (a) A time series exhibits a seasonal pattern with a seasonal index of 0.85 for quarter 3. The observed value for quarter 3 in a particular year is 51,000 units. The trend component for that quarter is estimated at 1.20. Assuming a multiplicative model, what is the irregular component (residual) for that quarter?

(b) A researcher is conducting a medical study aiming to predict whether patients are at a high risk of developing a particular medical condition based on their age (in years), cholesterol level (in mg/dL), and systolic blood pressure (in mmHg). The binary outcome is whether the patient develops the condition (coded as 1) or not (coded as 0). The researcher has compiled data of 100 patients. A binary logistics regression analysis has been conducted using SPSS with the following model output :

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	93.251	3	.000
	Block	93.251	3	.000
	Model	93.251	3	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	45.378[a]	.606	.809

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Classification Table[a]

	Observed		Predicted		
			Medical Condition		Percentage Correct
			No Medical Condition	Medical Condition	
Step 1	Medical Condition	No Medical Condition	46	4	92.0
		Medical Condition	6	44	88.0
	Overall Percentage				90.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age	0.309	0.167	3.432	1	0.054	1.362
	Cholesterol Level	0.073	0.036	4.254	1	0.039	1.076
	Systolic BP	0.238	0.062	14.965	1	0.000	1.269
	Constant	-55.247	11.759	22.072	1	0.000	0.000

a. Variable(s) entered on step 1: Age, Cholesterol Level, Systolic BP

Interpret the above output. 4+6

Please Turn Over

7. (a) Discuss briefly the None, Intercept and Intercept and Trend models in the context of Unit Root Testing.

(b) With a view to analyzing the long-run cointegration among the stock markets of BRICS nations : (I) B3 : Brazil Stock Exchange and Over the Counter Market (Brazil); (II) Moscow Exchange (Russia); (III) Bombay Stock Exchange Ltd. (BSE) (India); (IV) Shanghai Stock Exchange (SSE) (China); and (V) Johannesburg Stock Exchange Ltd. (JSE) (South Africa), the most prominent index in each of those stock exchanges considered are : (I) IBOVESPA (BOVESPA) (Brazil); (II) MOEX (Russia) : (III) Sensitivity Index (SENSEX) (India); (IV) SSE Composite Index (SSECI) (China); and (V) JTOPI (South Africa). The period of study considered is Covid-19 global crisis period (February 24, 2020 to June 23, 2020). Results of Johansen Cointegration Test (Covid-19 Global Crisis Period) are as follows :

No. of Hypothesised CE(s)	Eigenvalue	Trace Test		Max Eigenvalue Test	
		Statistic	Prob.	Statistic	Prob.
None	0.405907	86.91768	0.0012*	34.36751	0.0437*
At most 1	0.325573	52.55017	0.0170*	25.99690	0.0787
At most 2	0.174780	26.55327	0.1130	12.67894	0.4822
At most 3	0.144388	13.87433	0.0865	10.29192	0.1935
At most 4	0.052832	3.582410	0.0584	3.582410	0.0584

Significant at 5% level of significance.

You are asked to answer the following :

(i) Point out the pre-conditions in applying the Johansen Cointegration Model.

(ii) Develop the required hypotheses in applying such Model, and

(iii) Elaborate the inferences based on the results of Johansen Cointegration Test (Covid-19 Global Crisis Period) at 5 per cent level of significance. 4+(2+2+2)

8. You are a public health researcher interested in social factors that influence heart disease. You have surveyed 498 towns and gathered data on the percentage of people in each town who smoke, the percentage of people in each town who bike to work, and the percentage of people in each town who have heart disease. You want to see if the practice of using bike to work and smoking habit have significant influence in deescalating or escalating heart disease. You have conducted a linear regression analysis using SPSS with the following results :

Model Summary[b]					
Model	R	R Square	Adjusted R Square	SE of the Estimate	Durbin-Watson
1	.990[a]	.980	.980	.65403	1.917
a. Predictors: (Constant), Smoking, Biking					
b. Dependent Variable: Heart Disease					

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	14.985	.080		187.3125	.000		
	Biking	-.200	.001	-.940	-200.00	.000	1.000	1.000
	Smoking	.178	.004	.323	44.50	.000	1.000	1.000
a. Dependent Variable: Heart Disease								

Breusch-Pagan Test for Heteroskedasticity[a,b,c]		
Chi-Square	df	Sig.
981.587	1	.000
a. Dependent variable: Heart Disease		
b. Tests the null hypothesis that the variance of the errors does not depend on the values of the independent variables.		
c. Predicted values from design: Intercept + Biking + Smoking + Biking * Smoking		

You are required to :

(a) Interpret the model summary;

(b) Interpret the Coefficient Table;

(c) Identify if the model suffers from

(i) Autocorrelation Problem

(ii) Multicollinearity Problem, and

(iii) Heteroscedasticity Problem. (Given, for 5% level of significance $d_u = 1.789$). 10