PREVIEW QUESTION BANK

Module Name : STATISTICAL SCIENCE-ENG
Exam Date : 14-Jul-2023 Batch : 10:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	1201	A crossing of two or more breeds and alternately mating the hybrid females over several generations with males of the original breeds is called 1. Criss crossing 2. Back crossing 3. Test crossing 4. Out crossing A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
2	1202	"Red Rot" disease is related to 1. Rice 2. Maize 3. Wheat 4. Sugarcane A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
3	1203	Sharbati Sonora variety of wheat was obtained by 1. Crossing with wild varieties of wheat 2. Hybridization between wild varieties of wheat 3. X-ray treatment 4. Irradiation with gamma rays A1 : 1 A2 : 2	4.0	1.00

		A3 : 3 A4 : 4		
Objective Question				
4	1204	Sulfur-based fungicides are used against which of the following diseases? 1. Red rot 2. Stem rot 3. Powdery mildew 4. Downy mildew A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
5	1205	In sugarcane, sugar is stored in which cell? 1. Parenchymatous cells 2. Vascular Bundles 3. Meristematic Cells 4. Scleranchyma Cell A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
6	1206	Apple wooly aphid-resistant variety is 1. Eastern Spy 2. Western Spy 3. Northern Spy 4. Southern Spy A1 : 1 A2 : 2 A3 : 3	4.0	1.00

		A4 : 4		
Objective Question				
7	1207	A rainy day as defined by the India Meteorological Department is a day when the rainfall at a point received is ..... in 24 hours 1. >2.5 mm 2. >2.0 mm 3. >3.5 mm 4. >2.25 mm A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
8	1208	National Biodiversity Authority is located at 1. Kolkatta 2. Delhi 3. Chennai 4. Banglore A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
9	1209	Average product is equal to marginal product when: 1. Marginal Product is unity 2. Marginal Product is zero 3. Average Product is minimum 4. Average Product is maximum A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question				
10	1210	Which of the following states has recognition because of *Sharbati* wheat? 1. Punjab 2. Haryana 3. Madhya Pradesh 4. Rajasthan A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
11	1211	Alluvial soils vary in nature from sandy loam to clay. They are generally - 1. Poor in potash and rich in phosphorus 2. Poor in both potash and phosphorus 3. Rich in both potash and phosphorus 4. Rich in potash and poor in phosphorus A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
12	1212	Which among the following is not a cereal? 1. Rice 2. Wheat 3. Gram 4. Maize A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
13	1213		4.0	1.00

		In drawing histogram for unequal class intervals the height of the rectangles will be: 1. Proportional to the frequencies of the class intervals 2. Proportional to the ratios of the frequencies to the widths of class intervals 3. Proportional to the frequencies of the succeeding class intervals 4. Proportional to the ratios of the frequencies to the widths of succeeding class intervals A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
14	1214	The sum of deviation of values x_i from their mean is: 1. Zero 2. Less than zero 3. More than zero 4. Infinity A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
15	1215	If 3% of calculators are defective, find the standard deviation of the defectives in 300 calculators? 1. 2.954 2. 8.73 3. 9 4. 3 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
16	1216		4.0	1.00

		" Salaries of the employees in ICAR", is an example of which level of measurement? 1. Nominal 2. Ordinal 3. Interval 4. Ratio A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
17	1217	The distribution that is formed by all possible values of a statistics is known as: 1. Normal distribution 2. Binomial distribution 3. Sampling distribution 4. Uniform distribution A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
18	1218	In RCBD we may assume that the treatment are fixed and the blocks are random, such a model is called 1. Random effect model 2. Fixed effect model 3. Mixed effect model 4. Regression model A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
19	1219		4.0	1.00

		If in the CRD some observations are missing then also the analysis is very simple, because the missing observations are discarded and we carry out the experiment without losing the..... 1. Efficiency of the design 2. Degrees of freedom 3. Lower bound of the variance 4. Unbiasedness A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
20	1220	If the regression line is given by X= 2 + 4Y, then the correlation coefficient (r) is 1. 1/4 2. 4 3. positive 4. More than one A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
21	1221	Chose the correct answer: 1. Measures of skewness are independent of origin and scale 2. Measures of skewness are independent of origin and not of scale 3. Measures of skewness are independent of scale and not of origin 4. Measures of skewness are dependent of origin and scale A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
22	1222		4.0	1.00

		A student while calculating the mean of 25 observations obtained a mean of 56 cm. It was later discovered at the time of checking that he had wrongly copied down an observation as 64. What is the mean if the correct value is omitted? 1. 55 2. 57 3. 56.33 4. 55.67 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
23	1223	In the standard normal distribution, P(Z ≤ 0) is equal to: 1. 1 2. 0.5 3. >0 4. <1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
24	1224	A sample consists of: 1. All units of the population 2. 5% units of the population 3. 12.5% units of the population 4. Any fraction of the population A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
25	1225		4.0	1.00

		X and Y are two random variable with μ_x= 18.4, μ_y= 33, σ_x = 8.4, σ_y=6.4 and ρ_{xy}=0.84. The regression line of Y on X is 1. Y= X+ 7.3 2. Y= 0.64X+21.22 3. Y= 0.64X+10.61 4. Y= 0.4X+12.82 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
26	1226	The diameter at breast height (DBH) of 20 trees are as follows 1 3 5 5 7 8 8 8 8 8 8 9 9 9 9 9 10 10 10 10. What are the Value of 1st quartile (Q_1), 2nd quartile (Q_2) and 3rd quartile (Q_3)? 1. Q_1 = 7.5, Q_2= 8 and Q_3= 8 2. Q_1 = 7.5, Q_2= 8 and Q_3= 9 3. Q_1 = 8, Q_2= 9 and Q_3= 10 4. Q_1 = 8, Q_2= 8.5 and Q_3= 9 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
27	1227	The relation between standard deviation (SD), mean deviation about mean (MD) and quartile deviation (QD) is 1. 4SD=6MD=5QD 2. 4SD=5MD=6QD 3. 6SD=5MD=4SD 4. 5SD=4MD=6QD A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
28	1228		4.0	1.00

Let $\overline{X}$ be the mean of a random variable of size 5 from a normal distribution with μ=0 and variance σ^2 = 125. Determine c so that $P\{\overline{X} < c\} = 0.90$

1. 6.10
2. 6.20
3. 6.30
4. 6.40

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

29 1229 4.0 1.00

A die is thrown 60 times and number of times the following faces were obtained

Faces	1	2	3	4	5	6
No of times	14	7	5	8	10	16

Can the die be regarded as fair? Given $\chi^2_{0.05,5} = 11.07$

1. The die is not fair
2. The die is fair
3. no conclusion
4. experiment is conducted again

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

30 1230 4.0 1.00

Let random variables $X_1, X_2,..., X_k$ follows a multinominal distribution with parameter n and p_i where i= 1, 2,...,k. what is the value of Cov (X_i, X_j)?

1. np_ip_j
2. $-np_ip_j$
3. p_ip_j
4. $-p_ip_j$

A1 : 1

A2 : 2

A3 : 3

		A4 : 4		
Objective Question				
31	1231	Given the eight sample values as -4, -3, -3, 0, 3, 3, 4, 4, the value of student's t- test H_0: $\mu=0$ is: 1. 2.73 2. 0.97 3. 3.30 4. 0.41 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
32	1232	A random sample of size 20 from a normal population gives a mean 42 and variance 25. To test that the population standard deviation is 8, the value of test statistics is 1. 7.42 2. 15.62 3. 51.20 4. 55.60 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
33	1233	In Simple Random Sampling with replacement (SRSWR), the total no. of samples (with standard notation) will be 1. $\binom{N}{n}$ 2. N^n 3. n+ N 4. n*N A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

34	1234	If two independent random variable X and Y are binomially distributed with n_1=4, p=(1/3) and n_2=5, p= (1/3) respectively, Find the mode of the distribution of (X+Y). 1. 3,2 2. 3 3. 3,4 4. 4 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

35	1235	Suppose the correlation coefficient for a pair of 625 random sample is 0.2. Is the value of r significant? Given $t_{0.05,\ 623}$=1.96. 1. Yes, value of r is significant 2. No, value of r is not significant 3. may or may not be significant 4. test is invalid A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

36	1236	Let X be a random variable with p.d.f. f(x) =6x(1-x), 0≤ x ≤1. Determine the value of k such that P(X < b)=P(X >b). 1. $\frac{1}{2}$ 2. $\frac{1 \mp \sqrt{3}}{2}$ 3. 0 4. $\frac{1}{3}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question				
37	1237	A person speaks truth 4 out of 5 times. A die is tossed. He reports that there is a six. What is the chance that actually there was six? 1. $\frac{4}{9}$ 2. $\frac{5}{9}$ 3. $\frac{1}{9}$ 4. $\frac{1}{3}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
38	1238	If X and Y are independent Poisson variates, What is the distribution of $\frac{X}{X+Y}$? 1. Binomial distribution 2. Poisson distribution 3. Negative binomial distribution 4. Multinomial distribution A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
39	1239	The range of Correlation coefficient is 1. -1 to +1 2. -1 to 0 3. 0 to +1 4. - ∞ to +∞ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

40	1240	The relationship between root mean square deviation (r.m.s.d.) and standard deviation (s.d.) is 1. s.d.= highest value of r.m.s.d. 2. s.d. = least value of r.m.s.d. 3. s.d.= r.m.s.d. 4. s.d.= (r.m.s.d)/2 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

41	1241	For any discrete distribution, what is the value of β_2 1. $\beta_2 > 1$ 2. $\beta_2 \geq 1$ 3. $\beta_2 < 1$ 4. $\beta_2 \leq 1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

42	1242	Which of the following measures of central tendency is not affected by presence of outliers 1. Arithmetic mean 2. Harmonic mean 3. Median 4. Geometric mean A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

43	1243		4.0	1.00

		The point of intersection of the 'less than' and the 'more than' ogive corresponds to 1. Arithmetic mean 2. Geometric mean 3. Harmonic mean 4. Median A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
44	1244	For a discrete data set when all the values are not same then the relationship between mean deviation about mean (MD) and standard deviation (SD) is 1. MD= SD 2. MD < SD 3. MD > SD 4. MD ≤ SD A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
45	1245	The coefficient of variation of Poisson distribution with mean 9 is 1. 100 * 3 2. 100* 9 3. 100* (1/3) 4. 100*(1/9) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
46	1246		4.0	1.00

		A random variable X is normally distributed with zero mean and unit variance. The variance of X^2 is 1. 0 2. 1 3. 2 4. 4 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
47	1247	If all frequencies of classes are same, the value of chi-square(χ^2) is: 1. 0 2. 1 3. 2 4. 0.5 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
48	1248	Two independent variables have mean 5 and 10 and variances 5 and 9 respectively. Obtain the correlation between $Y_1 = 3X_1 + 4X_2$ and $Y_2 = 3X_1 - X_2$ 1. 0 2. $\frac{1}{2}$ 3. $\frac{3}{4}$ 4. $\frac{5}{9}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
49	1249		4.0	1.00

		If the sample means for each of the *k* treatment groups were identical, what would be the observed value of the ANOVA test statistic? 1. 0 2. 1 3. 0.1 4. Very small number A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
50	1250	If the mean and variance of a variable following binomial distribution are 16 and 8 respectively, then find P (X>0). 1. $(1/2)^{32}$ 2. $1-(1/2)^{32}$ 3. $(1/2)^{16}$ 4. $1-(1/2)^{16}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
51	1251	In a Binomial Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the standard deviation is given by? 1. np 2. $(np)^2$ 3. np(1-p) 4. square-root{np(1-p)} A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
52	1252		4.0	1.00

		Out of these, which is not a probability sampling? 1. cluster sampling 2. stratified sampling 3. quota sampling 4. simple random sampling A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
53	1253	In Standard normal distribution, the value of median is _____ 1. 1 2. Any positive number 3. 5 4. 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
54	1254	In one-way ANOVA, if the caluclated F value is less than the table F value then: 1. Reject the hypothesis that the population means are equal 2. Accept the hypothesis that the population means are equal 3. Depends on level of significance 4. Sometimes accept and sometimes reject the null hypothesis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
55	1255		4.0	1.00

		If a hypothesis is rejected at the 0.025 level of significance, it: 1. Must Be Rejected At Any Level 2. Must Be Rejected At The 0.01 Level 3. Must Not Be Rejected At The 0.01 Level 4. May Or May Not Be Rejected At The 0.01 Level A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
56	1256	The run scored by Virat Kohli during IPL 2023 are as follows: 2, 45, 65, 7, 5, 14, 26, 46, 43, 112, 113, 9, 13, and 49. Find the median score. 1. 36 2. 34.5 3. 34 4. 7.5 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
57	1257	The independent variable is also called: 1. Regressor 2. Regressand 3. Predictand 4. Estimated A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
58	1258		4.0	1.00

		In a one-tail test for the population mean, if the null hypothesis is not rejected when the alternative hypothesis is true, then: 1. Make adjustments with level of significance 2. A Correct Decision Is Made 3. A Type II Error Is Committed 4. A Type I Error Is Committed A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
59	1259	For a Poisson Distribution, if mean(m) = 1, then P(1) is? 1. 1 2. 1/e 3. e 4. e/2 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
60	1260	A larger standard deviation for a normal distribution with an unchanged mean indicates that the distribution becomes: 1. flatter and wider 2. more skewed to the left 3. narrower and more peaked 4. Change in the standard deviation does not change the shape of the distribution A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
61	1261		4.0	1.00

		Which of the following does not describe the local alignment algorithm? 1. In traceback step, beginning is with the highest score, it ends when 0 is encountered 2. First row and first column are set to 0 in initialization step 3. The score can be negative 4. Negative score is set to 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
62	1262	MAtDB is a model organism database for 1. Mouse 2. E coli 3. Arabidopsis 4. Human A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
63	1263	What is the primary objective of bioinformatics? 1. To develop new drugs and therapies 2. To study the structure and function of molecules 3. To analyze and interpret biological data using computational tools 4. To design and engineer new biological systems A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
64	1264		4.0	1.00

		Which of the following is not an example of DBMS? 1. MySQL 2. Microsoft Access 3. IBM DB2 4. Google A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
65	1265	Which of the following is known as a set of entities of the same type that share same properties, or attributes? 1. Relation set 2. Tuples 3. Entity set 4. Entity Relation model A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
66	1266	Which of the following statements is a valid way to open the file test.data and associate it with unit 10? 1. open(10,test.data) 2. open(10,'test.data') 3. open(10, file= test.data) 4. open(10,file='test.data') A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
67	1267		4.0	1.00

		Which of the following is invalid statement in FORTRAN 1. Continue 2. Dimension X (30,20) 3. DO 10001 = 1,5 4. P + Q + A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
68	1268	On the Hammond machines, a single precision floating point (REAL*4) number uses how many bits of memory? 1. 4 2. 7 3. 32 4. 22 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
69	1269	Which of the following language does the computer understand? 1. Computer understands only C Language 2. Computer understands only Assembly Language 3. Computer understands only Binary Language 4. Computer understands only BASIC A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
70	1270		4.0	1.00

		Which of the following is not a characteristic of a computer? 1. Versatility 2. Accuracy 3. Diligence 4. I.Q. A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
71	1271	A wireless technology built-in electronic gadgets used for exchanging data over short distances is? 1. Wifi 2. Bluetooth 3. Modem 4. USB A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
72	1272	Which of the following invention gave birth to the much cheaper microcomputers? 1. PDAs 2. Microprocessors 3. Microcomputers 4. Mainframes A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
73	1273		4.0	1.00

The determinant of a matrix $A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$ is

1. 1
2. -1
3. 2
4. -2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

74	1274	Let $T: \mathbb{R}^2(\mathbb{R}) \rightarrow \mathbb{R}^2(\mathbb{R})$ be a linear transformation such that T is a rotation at angle of 90^0 in clockwise direction in $\mathbb{R}^2$, then 1. $T(1,0) = (0,1)$ 2. $T(-1,0) = (1,-1)$ 3. $T(1,0) = (0,-1)$ 4. $T(-1,0) = (1,1)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

75	1275	Let A be a $n \times n$ matrix of real numbers such that $A^2 = I$, then the eigen values of A are 1. $0, 1$ 2. $1, -1$ 3. $1,1$ 4. $-1, -1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question				
76	1276	Let A be a 5×5 skew-symmetric matrix of real numbers, then which of the following is true 1. A is singular matrix 2. A is invertible 3. All the eigen values are complex number 4. $\|A\| \neq 0$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
77	1277	Which of the following statement is always true 1. Every single non-zero vector is linearly dependent 2. Every empty set is linearly dependent 3. Every empty set is linearly independent 4. Every non-empty set is linearly independent A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
78	1278	Let V and W be vector spaces and $T: V \to W$ be linear transformation, then 1. Nullity (T) is subspace of W 2. Rank (T) is subspace of V 3. $T(o_V) = o_W$ 4. $T(o_V) = I$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				

79	1279	The inverse of a matrix $A = \begin{bmatrix} 0 & 2 & 4 \\ 2 & 4 & 2 \\ 3 & 3 & 1 \end{bmatrix}$ is 1. $\begin{bmatrix} -1 & \frac{1}{2} & 0 \\ \frac{1}{2} & 0 & 0 \\ \frac{3}{8} & \frac{-3}{8} & \frac{1}{4} \end{bmatrix}$ 2. $\begin{bmatrix} \frac{1}{8} & \frac{-5}{8} & \frac{3}{4} \\ \frac{-1}{4} & \frac{3}{4} & \frac{-1}{2} \\ \frac{3}{8} & \frac{-3}{8} & \frac{1}{4} \end{bmatrix}$ 3. $\begin{bmatrix} \frac{1}{8} & \frac{-5}{8} & \frac{3}{4} \\ \frac{-1}{4} & \frac{3}{8} & \frac{-1}{2} \\ \frac{3}{8} & \frac{-3}{8} & \frac{1}{4} \end{bmatrix}$ 4. $\begin{bmatrix} -1 & \frac{1}{2} & 0 \\ 1 & 0 & 0 \\ \frac{3}{8} & \frac{-3}{8} & \frac{1}{8} \end{bmatrix}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
80	1280	Let $A_{m\times n}$ be any matrix and Rank (A) = 0, then matrix A is 1. Invertible 2. Identity matrix 3. Non-singular 4. Zero-matrix A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
81	1281	Which of the following statement is always true for a square matrix 1. If matrix is singular, then determinant is non-zero 2. If a matrix is non-singular, then determinant is zero 3. If a matrix is invertible, then determinant is non-zero 4. If a matrix is not invertible, then the determinant is non-zero	4.0	1.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
82	1282	Let $(a_n) = (-1)^n$ and $(b_n) = -2^n$ be sequences of real numbers, then 1. (a_n) is convergent and (b_n) is divergent 2. (a_n) is divergent and (b_n) is convergent 3. Both (a_n) and (b_n) are convergent 4. Both (a_n) and (b_n) are divergent A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
83	1283	Let $(a_n) = r^n$, where r be any real number, then 1. (a_n) is convergent for any r 2. (a_n) is divergent for any r 3. (a_n) is convergent for any $\|r\| < 1$ 4. (a_n) is divergent for any $\|r\| < 1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
84	1284	$\lim_{n\to\infty} \frac{1+2+3+\cdots+n}{n^2}$ is 1. 1 2. $\frac{1}{2}$ 3. 0 4. 2 A1 : 1	4.0	1.00

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
85	1285	Let $(a_n) = \frac{\sin n}{n}$ be a sequence of real numbers, then $\lim_{n\to\infty} a_n$ is 1. 0 2. 1 3. Does not exist 4. $\frac{1}{2}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
86	1286	For what value of p, the series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is convergent 1. 2 2. 1 3. $\frac{1}{2}$ 4. $\frac{2}{3}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
87	1287	The series $\sum_{n=1}^{\infty} a_n = \sum_{n=1}^{\infty} \frac{1}{n^2}$ and $\sum_{n=1}^{\infty} b_n = \sum_{n=1}^{\infty} \frac{1}{n^3}$ are 1. Both divergent 2. Both convergent 3. $\sum_{n=1}^{\infty} a_n$ is convergent and $\sum_{n=1}^{\infty} b_n$ is divergent 4. $\sum_{n=1}^{\infty} a_n$ is divergent and $\sum_{n=1}^{\infty} b_n$ is convergent A1 : 1	4.0	1.00

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
88	1288	The value of i^i, ($i^2 = -1$) is 1. 0 2. 1 3. -1 4. $e^{\frac{-\pi}{2}}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
89	1289	The equation of conic section whose vertices are $(0, \pm 8)$ and asymptotes are $y = \pm\frac{4}{3}x$ is given by 1. $\frac{x^2}{36} + \frac{y^2}{64} = 1$ 2. $\frac{x^2}{36} - \frac{y^2}{64} = 1$ 3. $\frac{x^2}{64} + \frac{y^2}{36} = 1$ 4. $-\frac{x^2}{36} + \frac{y^2}{64} = 1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
90	1290	Let $3x + 2iy - ix + 5y = 7 + 5i$, then values of x and y respectively are given by 1. $-1, 2$ 2. $2, -1$ 3. $-8, 3$ 4. $1, -2$ A1 : 1	4.0	1.00

A2 : 2

A3 : 3

A4 : 4

Objective Question

91	1291	Let $Z_1 = r_1(\cos\theta_1 + i\sin\theta_1)$ and $Z_2 = r_2(\cos\theta_2 + i\sin\theta_2)$ be two complex numbers, then value of Z_1Z_2 is 1. $r_1r_2[\cos(\theta_1\,\theta_2) + i\sin(\theta_1\,\theta_2)]$ 2. $r_1r_2[\cos(\theta_1 + \theta_2) + i\sin(\theta_1 + \theta_2)]$ 3. $r_1r_2[\cos(\theta_1 - \theta_2) + i\sin(\theta_1 - \theta_2)]$ 4. $\frac{r_1}{r_2}[\cos(\theta_1 + \theta_2) + i\sin(\theta_1 + \theta_2)]$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

92	1292	If $\cos\theta = \frac{e^{i\theta}+e^{-i\theta}}{2}$ and $\sin\theta = \frac{e^{i\theta}-e^{-i\theta}}{2}$, then $\cos\theta - \sin\theta$ is equal to 1. $e^{i\theta}$ 2. $e^{-i\theta}$ 3. $-e^{i\theta}$ 4. $-e^{-i\theta}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

93	1293	If A and B be orthogonal matrices of same size, then 1. $\lvert A\rvert = \pm 1$ 2. $A^T = -A^{-1}$ 3. $\lvert A\rvert = 0$ 4. AB is not orthogonal A1 : 1 A2 : 2	4.0	1.00

		A3 : 3 A4 : 4		
Objective Question				
94	1294	The sum and product of the roots of the polynomial $x^2 - 2x - 8$ are respectively 1. $2, 8$ 2. $-2, 8$ 3. $-2, -8$ 4. $2, -8$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
95	1295	From point Q which is outside the circle, the length of the tangent to the circle is 24 cm and the distance of Q from the centre is 25 cm, then the radius of the circle is given by 1. 7 cm 2. 12 cm 3. 15 cm 4. 24.5 cm A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
96	1296	Roots of the equation $x^3 - 23x^2 + 142x - 120 = 0$ are 1. $1, 10, 12$ 2. $-1, 10, 12$ 3. $1, -10, 12$ 4. $-1, -10, -12$ A1 : 1 A2 : 2	4.0	1.00

		A3 : 3 A4 : 4		
Objective Question				
97	1297	The value of $\lim_{x \to 1^-} \frac{x-1}{\lvert x^2-1 \rvert}$ is given by 1. $\frac{1}{2}$ 2. $-\frac{1}{2}$ 3. -1 4. 1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
98	1298	A manufacturer can produce shoes at a cost of 50 dollars per pair and estimates that if they are sold for x dollars per pair, consumers will buy approximately $S(x) = 1000\, e^{-0.1x}$ pair of shoes per week. The price at which the manufacturer sell the shoes to maximize profit is given by 1. $x = 40$ 2. $x = 50$ 3. $x = 60$ 4. $x = 70$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
99	1299	The horizontal asymptote for $y = \frac{-8}{x^2-4}$ is given by 1. $y = 0$ 2. $y = 8$ 3. $y = 4$ 4. $y = 2$	4.0	1.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
100	1300	If $x = a\sin^3 t$ and $y = b\cos^3 t$, then the value of $\frac{d^2y}{dx^2}$ is given by 1. $\frac{b}{3a^2}\sin^4 t\cos t$ 2. $\frac{b}{3a^2}\operatorname{cosec}^4 t\sec t$ 3. $\frac{a}{3b^2}\sin^4 t\cos t$ 4. $\frac{a}{3b^2}\operatorname{cosec}^4 t\sec t$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
101	1301	If $u = \sin^{-1}\left(\frac{x+2y+3z}{x^8+y^8+z^8}\right)$, then the value of $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z}$ is given by 1. $-7\tan u$ 2. $7\tan u$ 3. $7\sin u$ 4. $-7\sin u$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
102	1302		4.0	1.00

Using chain rule, the derivative of $\omega = x^2y - y^2$ with respect to t along the path $x = \sin t$ and $y = e^t$ at $t = 0$ is given by

1. 0
2. -1
3. 2
4. -2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

103	1303	The value of $\int x\tan^{-1}x \ dx$ is given by 1. $\frac{x^2}{2}\cot^{-1}x - \frac{1}{2}x - \frac{1}{2}\cot^{-1}x + C$ 2. $\frac{x^2}{2}\sec^{-1}x - \frac{1}{2}x - \frac{1}{2}\sec^{-1}x + C$ 3. $\frac{x^2}{2}\tan^{-1}x - \frac{1}{2}x + \frac{1}{2}\tan^{-1}x + C$ 4. $\frac{x^2}{2}\tan^{-1}x - \frac{1}{4}x - \frac{1}{2}\tan^{-1}x + C$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

104	1304	The value of $\int_0^{\frac{\pi}{2}} \sin^2\frac{x}{2}\cos^2\frac{x}{2} \ dx$ is given by 1. $\frac{\pi}{2}$ 2. $\frac{\pi}{4}$ 3. $\frac{\pi}{16}$ 4. π A1 : 1 A2 : 2	4.0	1.00

		A3 : 3 A4 : 4		
Objective Question				
105	1305	The value of $\int_0^{\pi}\int_0^{\cos y} x \sin y \, dx \, dy$ is given by 1. $\frac{1}{2}$ 2. $\frac{1}{3}$ 3. $\frac{1}{5}$ 4. $-\frac{1}{3}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
106	1306	The solution of the differential equation $(1 + ye^{xy})dx + (2y + xe^{xy})dy = 0$ is given by 1. $x + e^{xy} + y^2 = C$ 2. $y + e^{xy} + x^2 = C$ 3. $e^x + xy + e^y = C$ 4. $e^x - xy + e^y = C$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
107	1307	The solution of the differential equation $x\frac{dy}{dx} + y = x^3y^6$ is given by 1. $x^3y^5(2.5 + cx^2) = 1$ 2. $x^5y^3(2.5 + cx^2) = 1$ 3. $x^3y^5(2.5 + cy^2) = 1$ 4. $x^5y^3(2.5 + cy^2) = 1$ A1 : 1	4.0	1.00

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
108	1308	The solution of the differential equation $\frac{d^3y}{dx^3}+\frac{d^2y}{dx^2}+4\frac{dy}{dx}+4=0$ is given by 1. $y=C_1e^x+C_2\cos 2x+C_3\sin 2x$ 2. $y=C_1e^{-x}+C_2\cos 2x+C_3\sin 2x$ 3. $y=C_1e^{2x}+C_2\cos 2x+C_3\sin 2x$ 4. $y=C_1e^{-2x}+C_2\cos 2x+C_3\sin 2x$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
109	1309	If Δ and ∇ be the first forward difference and first backward difference operator respectively of a function $f(x)$ then the expression $(\Delta-\nabla)$ is equivalent to 1. $\frac{\Delta}{\nabla}$ 2. Δ^2 3. $\Delta\nabla$ 4. $\left(\frac{1}{\Delta}-\frac{1}{\nabla}\right)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
110	1310	While applying Simpson's three eighth rule for numerical integration, the number of sub-intervals should be taken as multiple of 1. 2 2. 3 3. 8 4. 6	4.0	1.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
111	1311	The technique of estimating the value of a function for any intermediate value of the given independent variable is 1. Leibnitz rule 2. Extrapolation 3. Interpolation 4. Trapezoidal rule A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
112	1312	If a continuous function f has a relative extremum at c, then c must be 1. a cusp of f 2. a critical number of f 3. a pole of f 4. a horizontal asymptote of f A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
113	1313		4.0	1.00

		Suppose the function f is continuous at the point $P\big(c, f(c)\big)$. Then, the graph of f has a cusp at P if 1. $\lim_{x\to c^-} f'(x) = +\infty$ and $\lim_{x\to c^+} f'(x) = +\infty$ 2. $\lim_{x\to c^-} f'(x) = -\infty$ and $\lim_{x\to c^+} f'(x) = -\infty$ 3. $\lim_{x\to c^-} f'(x) = +\infty$ and $\lim_{x\to c^+} f'(x) = -\infty$ 4. $\lim_{x\to c^-} f'(x) = 0$ and $\lim_{x\to c^+} f'(x) = 1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
114	1314	The value of $\lim_{x\to+\infty} \frac{\ln x}{x^2}$ is given by 1. 1 2. $-\infty$ 3. $+\infty$ 4. 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
115	1315	Suppose f is continuous on $[a, b]$ and differentiable on (a, b). If $f(a) = f(b)$, then there exists at least one number c between a and b such that 1. $f'(c) = 0$ 2. $f'(c) = b - a$ 3. $f'(c) = \lim_{x\to a} f(x)$ 4. $f'(c) = \lim_{x\to b} f(x)$ A1 : 1 A2 : 2 A3 : 3	4.0	1.00

A4 : 4

Objective Question

116	1316	If f is continuous on $[a,b]$, then there is at least one number c between a and b such that 1. $\int_a^b f(x)dx = f(c)(b-a)$ 2. $\int_a^b f(x)dx = f(a)(c-b)$ 3. $\int_a^b f(x)dx = f(b)(c-a)$ 4. $\int_a^b f(x)dx = f'(c)(b-a)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

117	1317	If f and g are integrable on $[a,b]$ and $f(x) \geq g(x)$ for all x in $[a,b]$, then 1. $\int_a^b f(x)dx \neq \int_a^b g(x)dx$ 2. $\int_a^b f(x)dx \geq \int_a^b g(x)dx$ 3. $\int_a^b f(x)dx \leq \int_a^b g(x)dx$ 4. $\int_a^b f(x)dx$ and $\int_a^b g(x)dx$ does not exist A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00

Objective Question

118	1318	Suppose that a particle moves on a coordinate line so that its velocity at time t is $v(t) = t^2 - 2t\ m/s$, then the displacement of the particle during the time interval $0 \leq t \leq 3$ is given by 1. $0\ m$ 2. $1\ m$ 3. $\frac{1}{2}m$ 4. $3\ m$	4.0	1.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
119	1319	For the function $f(x) = \sin x + \cos x$, the point of relative maxima on $[0, 2\pi]$ is given by 1. $\left(\frac{\pi}{4}, \sqrt{2}\right)$ 2. $\left(-\frac{\pi}{4}, -\sqrt{2}\right)$ 3. $\left(-\frac{\pi}{4}, \sqrt{2}\right)$ 4. $\left(\frac{\pi}{4}, -\sqrt{2}\right)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00
Objective Question				
120	1320	$\Gamma(n) = \int_0^\infty e^{-x} x^{n-1} dx$, $(n > 0)$, then the value of $\int_0^{\pi/2} \cos^n x \, dx$ is given by 1. $\frac{\Gamma\left(\frac{n+1}{2}\right)}{\Gamma\left(\frac{n+2}{2}\right)} \frac{\sqrt{\pi}}{2}$ 2. $\frac{\Gamma\left(\frac{n+2}{2}\right)}{\Gamma\left(\frac{n+1}{2}\right)} \frac{\sqrt{\pi}}{2}$ 3. $\frac{\Gamma\left(\frac{n}{2}\right)}{\Gamma\left(\frac{n+1}{2}\right)} \frac{\sqrt{\pi}}{2}$ 4. $\frac{\Gamma\left(\frac{n+1}{2}\right)}{\Gamma\left(\frac{n}{2}\right)} \frac{\sqrt{\pi}}{2}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	1.00