FOUNDATION EXAMINATION

MODEL QUESTION PAPER **TERM – JUNE 2024**

PAPER - 3

FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS

Time Allowed: 1 Hour **Full Marks: 100**

Answer all questions. Each question carries 2 marks.

1.	The ratio of the number of faces to the number of edges of a box is :		
	(a)	3:8	O
	(b)	8:3	O
	(c)	1:2	O
	(d)	2:1	O
2.	What will be the value of $(9^3)^2$?		
	(a)	59004 × 9	O
	(b)	59049 × 9	O
	(c)	49005 × 9	O
	(d)	49059 × 9	O
3.	Find the value of the logarithm of 2nd number (b) for 3 consecutive numbers (a, b, c).		
	(a)	log(1+ ac)	O
	(b)	$\frac{1}{2}$ × 2×log(1+ ac)	O
	(c)	$\frac{1}{2}$×log(1+ ac)	O
	(d)	2×log(1+ ac)	O
4.	A loan of ₹20,000 has been issued for 5 years. Compute the amount to be repaid to the lender if simple interest is charged @ 8% per year.		
	(a)	₹ 28,000	O
	(b)	₹ 25,000	O
	(c)	₹ 27,000	O
	(d)	₹ 24,000	O
5.	If log(7y −5) = 2 , find the value of y.		
	(a)	15	O
	(b)	10	O
	(c)	8	O

	(d)	7	O
6.	the First term is 748, Last Term is 28, and the value between two consecutive terms is 9 deducted, find the number of terms in the series.		
	(a)	9	O
	(b)	8	O
	(c)	10	O
	(d)	None of these	O
7.	When a Bike had travelled for 78 km in 3 hours 45 minutes in the evening, how much distance would the Bike travelled in 2 hours?		
	(a)	41.60 km	O
	(b)	48.88 km	O
	(c)	52 km	O
	(d)	55 km	O
8.	If A takes 3 hours to cover a distance of 60 km, B takes 2 hours to cover a distance of 50 km, how much time would A take more than B to cover 300 km?		
	(a)	6 hours	O
	(b)	12 hours	O
	(c)	15 hours	O
	(d)	3 hours	O
9.	Compute $\frac{12!}{(8!\times 4!)}$		
	(a)	3960	O
	(b)	495	O
	(c)	99	O
	(d)	440	O
10.	Find the number of permutations for 15 scooters if 3 scooters are to be considered at a time.		
	(a)	2730	O
	(b)	2370	O

	(c)	2184	O
	(d)	2814	O
11.	A cycle travels a distance of 300 m in every second. What is the distance covered in an hour by the cycle?		
	(a)	3000 km	O
	(b)	1080 km	O
	(c)	1800 km	O
	(d)	2160 km	O
12.	In Venn diagram, Universal Set is represented by _____.		
	(a)	Stars	O
	(b)	Squares	O
	(c)	Rectangle	O
	(d)	Circles	O
13.	How many ways can 8 people get vaccinated from 8 vaccinators, assuming no vaccinator is idle?		
	(a)	40320 ways	O
	(b)	5040 ways	O
	(c)	5760 ways	O
	(d)	35280 ways	O
14.	Identify the type of series: 1+2+3+4+5 :		
	(a)	H.P.	O
	(b)	G.P.	O
	(c)	Either of ‘a’ or ‘b’	O
	(d)	A.P	O
15.	If $b^2 – 4ac > 0$, is a perfect square, the nature of roots would be _____.		
	(a)	Real and Equal	O

	(b)	Imaginary	O
	(c)	Unreal	O
	(d)	Real and Unequal	O
16.	When are nature of roots real rather than imaginary?		
	(a)	If Discriminant is negative	O
	(b)	If Discriminant is less than zero	O
	(c)	If Discriminant is not a perfect square	O
	(d)	If Discriminant is more than or equal to zero	O
17.	In how many different ways can 4 different cars, one of each of the 4 manufacturers, be parked in a parking lane?		
	(a)	20 ways	O
	(b)	22 ways	O
	(c)	24 ways	O
	(d)	26 ways	O
18.	The demand function is given by: $P = 1400 – 25Q$ and the cost function is given by $C = 10Q^2$. Find the value of Q at the equilibrium point.		
	(a)	10	O
	(b)	20	O
	(c)	30	O
	(d)	40	O
19.	Which one of the following has synonymous words?		
	(a)	Status, Staistik, Statista	O
	(b)	Staistik, Statista, Stats	O
	(c)	Statistic, Statistia, Stats	O
	(d)	Statistic, Statistia, Status	O

20.	A firm has a fixed production cost of ₹ 90 and a marginal variable production cost of ₹ 9. The price of the product is ₹18. Find the cost function, revenue function, and the value of Q at the Break Even point.		
	(a)	2Q + 20; 9Q; 10	O
	(b)	9Q + 90; 18Q; 10	O
	(c)	4Q + 90; 36Q; 20	O
	(d)	Q + 10; 5Q; 50	O
21.	With respect to accuracy :		
	(a)	Diagrammatic presentation is preferable to Tabular presentation	O
	(b)	Textual presentation is preferable to diagrammatic presentation	O
	(c)	Tabular presentation is preferable to Diagrammatic presentation	O
	(d)	Textual presentation is preferable to Tabular presentation	O
22.	A manufacturer has a monthly fixed cost of ₹1,00,000 and a production cost of ₹50 per unit produced. The product is sold at ₹75. Find the cost function and the number of products be sold by the manufacturer to have break even.		
	(a)	25x + 50,000; 2000	O
	(b)	50x + 1,00,000; 4000	O
	(c)	5x + 1,00,000; 3000	O
	(d)	2.5x + 10,000; 5000	O
23.	Because of heavy rain on Sunday average rainfall of a city for the week increased to 0.6 inch from the average rainfall 0.3 inch measured from Monday to Saturday. The rainfall on Sunday was-		
	(a)	2.4 inch;	O
	(b)	0.3 inch;	O
	(c)	2.1 inch;	O
	(d)	1.5 inch	O
24.	A person walks 8 km at 4km an hour, 6km at 3km an hour and 4km at 2km an hour. Average speed per hour is _____.		

	(a)	0.33	O
	(b)	2	O
	(c)	3	O
	(d)	.5	O
25.	The mean daily salary paid to all employees in a certain company was ₹600. The mean daily salaries paid to the male and female employees were ₹620 and ₹520 respectively. Male to female employees ratio in the company is :		
	(a)	3:2;	O
	(b)	4:5	O
	(c)	5:7;	O
	(d)	4:1;	O
26.	In a certain factory a unit of work is completed by A in 4 minutes, by B in 5 minutes, by C in 6 minutes, by D in 10 minutes, and by E in 12 minutes. Average number of units of work completed per minute is _____.		
	(a)	25/4	O
	(b)	5/48	O
	(c)	4/25	O
	(d)	25/48	O
27.	Which one of the following is a feature of Harmonic Mean (HM)?		
	(a)	GM is affected much by the presence of externally small or large observations;	O
	(b)	GM gives the actual value of the series;	O
	(c)	GM is useful when a given phenomenon has a limit for lower value;	O
	(d)	GM is imaginary if any of the observations is zero;	O
28.	It is the most suitable average when it is desired to give greater weight to smaller observations and less weight to larger ones. It is _____.		
	(a)	AM	O
	(b)	HM	O
	(c)	GM	O

	(d)	Median	O
29.	Raw data is :		
	(a)	Information which can be interpreted to take decision	O
	(b)	Information which can't be put to use directly	O
	(c)	Information which is not amenable to conversion	O
	(d)	Information which are useless	O
30.	The sum of the deviations of a certain number of observations measured from 4 is 72 and the sum of the deviations of the observations from 7 is -3. Mean of the observations is		
	(a)	6.88	O
	(b)	25	O
	(c)	3.63	O
	(d)	Cannot be ascertained with given data	O
31.	If b_{XY} and b_{YX} are regression coefficients of series X on series Y and regression coefficients of series Y on series X respectively then which one of the following is correct?		
	(a)	b_{XY} and b_{YX} will be either both positive or both negative	O
	(b)	b_{XY} will be positive and b_{YX} will be negative	O
	(c)	b_{XY} will be negative and b_{YX} will be positive	O
	(d)	Nothing can be said like this, it depends on X & Y values	O
32.	If $r^2 = 0.3$ & $b_{XY} = -1.5$ then b_{YX} is equal to :		
	(a)	+ 1	O
	(b)	– 0.2	O
	(c)	– 1	O
	(d)	– 0.45	O
33.	In a bivariate regression analysis for dependent variable if d = Actual value – Predicted value then at different values of independent variable _____.		
	(a)	Best fit curve occurs when $d_1^2 + d_2^2 + \ldots \ldots \ldots + d_n^2$ is minimum	O

	(b)	Best fit curve occurs when $d_1^2 + d_2^2 + \ldots \ldots \ldots + d_n^2$ is maximum	O
	(c)	Best fit curve occurs when $d_1^2 + d_2^2 + \ldots \ldots \ldots + d_n^2$ is zero	O
	(d)	Best fit curve occurs when $d_1^2 + d_2^2 + \ldots \ldots \ldots + d_n^2$ is one	O
34.	In a bivariate regression analysis $\Sigma XY = 1355.25$, $(\Sigma X)(\Sigma Y) = 6396$, $\Sigma X^2 = 591.50$ & $\Sigma X = 52$. If there are 5 items then b_{YX}		
	(a)	1	O
	(b)	0.97	O
	(c)	0.667	O
	(d)	1.5	O
35.	If b_{XY} and b_{YX} are regression coefficients of series X on series Y and regression coefficients of series Y on series X respectively then which one of the following is correct?		
	(a)	$b_{XY} \times b_{YX} = r$, where r is the correlation coefficient	O
	(b)	$b_{XY} \times b_{YX} = r^2$, where r is the correlation coefficient	O
	(c)	$b_{XY} \times b_{YX} = -r$, where r is the correlation coefficient	O
	(d)	$b_{XY} \times b_{YX} = 1/r$, where r is the correlation coefficient	O
36.	In a bivariate regression analysis, the difference between actual value of dependent variable and the predicted value of the dependent variable is called _____.		
	(a)	Outlier	O
	(b)	Slope	O
	(c)	Residual	O
	(d)	Scattered point	O
37.	In a regression equation:		
	(a)	Regression coefficient represents the increment in the value of the independent variable for a unit change in the value of the dependent variable	O
	(b)	Regression coefficient represents the increment in the value of the dependent variable for a unit change in the value of the independent variable	O
	(c)	Regression coefficient represents the mean value of the independent variable for a unit change in the value of the dependent variable	O

	(d)	Regression coefficient represents the mean value of the dependent variable for a unit change in the value of the independent variable	O
38.	In IPL Kolkata Knight Riders plays 70% of their games at night (8 O'clock slot) and 30% during the day (4 O clock slot). The team wins 50% of their night games and 90% of their day games. According to today's newspaper they own yesterday. The probability that the game was played at night is :		
	(a)	0.4667	O
	(b)	0.5645	O
	(c)	0.35	O
	(d)	0.5	O
39.	A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. The probability that the number of the drawn ball will be multiple of 3 or 7 is :		
	(a)	7/15	O
	(b)	13/30	O
	(c)	1/2	O
	(d)	None of these	O
40.	A bag contains 10 red and 10 green balls. A ball is drawn from it. The probability that it will be green is :		
	(a)	1/10	O
	(b)	1/3	O
	(c)	1/2	O
	(d)	None of these	O
41.	If an unbiased coin is tossed once, then the two events head and tall are:		
	(a)	Mutually exclusive	O
	(b)	Exhaustive	O
	(c)	Equally likely	O
	(d)	All these	O

42.	A survey by Air travelers' association revealed that 60% of its member made airline reservations last year. Two members are selected at random. The probability that both the members made airline reservations last year is :		
	(a)	0.6	O
	(b)	0.4	O
	(c)	0.36	O
	(d)	0.16	O
43.	A lot contains 10 items of which 3 are defective. Three items are chosen from the lot at random one after another without replacement. The probability that all the three are defective is		
	(a)	0.008	O
	(b)	0.992	O
	(c)	0.067	O
	(d)	0.05	O
44.	Addition rule for mutually exclusive events A & B is :		
	(a)	P(A or B) = P(A) +P(B)	O
	(b)	P(A or B) = P(A+B)	O
	(c)	P(A or B) = P(A) +P(B)-P(AB)	O
	(d)	P(A or B) = P(A+B - AB)	O
45.	Probability theory is often referred to as :		
	(a)	Science of prediction	O
	(b)	Science of uncertainty	O
	(c)	Science of chance	O
	(d)	Science of decision making	O
46.	From the following four year centered moving average against year 4 is Year 1 2 3 4 5 6 7 Import (₹ m) 229 231 206 191 195 184 193		
	(a)	190.671	O

	(b)	199.875	O
	(c)	192.375	O
	(d)	210	O
47.	By using arithmetic mean method, the index number from the following data is		

Commodity	Base price	Current price	Weight
Rice	30	52	8
Wheat	25	30	6
Fish	130	150	3
Potato	35	49	5
Oil	70	105	7

	(a)	144.92	O
	(b)	202.34	O
	(c)	161.87	O
	(d)	115.22	O
48.	Consider the following:		

Commodity	Base Price (₹)	Current price (₹)	Weight
A	22	40	8
B	15	15	6
C	80	90	7
D	110	130	3
E	25	30	5

Weighted aggregative index number is :

	(a)	123.34	O
	(b)	156.11	O
	(c)	176.52	O
	(d)	142.89	O
49.	From the following find the Simple average (GM) of Relative Quantity index		

Item	Base Year Quantity	Current Year Quantity
A	8	12
B	10	11
C	15	10

	(a)	100.23	O
	(b)	111.45	O
	(c)	190.15	O
	(d)	103.23	O
50.	From the data given below the wholesale price index number for the year 1 taking year 0 as base using simple arithmetic average of relatives method is : Commodity — Price year 0 — Price year 1 A — 80 — 120 B — 120 — 150 C — 40 — 80 D — 100 — 150 E — 200 — 240		
	(a)	180	O
	(b)	112	O
	(c)	134	O
	(d)	149	O