



# INDIAN SCHOOL AL WADI AL KABIR


## ASSESSMENT I: 2021 -2022

### Applied Mathematics – Practice Questions (Subject Code: 241)

1	Which of the following is not a binary number? (a) 1111                      (b) 101                      (c) 11E                      (d) 000
2	Binary equivalent of octal 76 is (a) 1101100                      (b) 1001100                      (c) 1001000                      (d) 1001010
3	$2\frac{1}{2} \cdot 4\frac{3}{4}$ is equal to (a) a fraction                      (b) a positive integer                      (c) a negative integer                      (d) none of these
4	The solution of $\frac{1}{2} \log_{10} 25 - 2 \log_{10} 3 + \log_{10} 18$ (a) 4                      (b) 3                      (c) 2                      (d) 1
5	$\log \frac{1}{81}$ to the base 9 is equal to .....
6	The value of $\log 0.0001$ to the base 0.1 is (a) 4                      (b) 3                      (c) 2                      (d) 1
7	The average of four consecutive even numbers is 27, then the largest number is..... (a) 26                      (b) 28                      (c) 30                      (d) 32
8	On 8 <sup>th</sup> December, 2007 Saturday falls. What day of the week was it on 8 <sup>th</sup> December 2006 ? (a) Sunday                      (b) Thursday                      (c) Tuesday                      (d) Friday
9	A clock is started at noon. By 10 minutes past 5, the hour hand has turned through (a) 145°                      (b) 150°                      (c) 155°                      (d) 160°
10	'A' does a work in 10 days and 'B' does the same work in 15 days. In how many days they together will do the same work? (a) 5 days                      (b) 6 days                      (c) 8 days                      (d) 9 days
11	The length of the longest pole that can be placed in a room 12m long 8m broad and 9m high is (a) 12                      (b) 15                      (c) 17                      (d) 29
12	Six persons are sitting in a circle. A is facing B. B is to the right of E and left of C. C is to the left of D. F is to the right of A. Now, D exchanges his seat with F, and E with B. Then person sitting left to D is (a) A                      (b) B                      (c) E                      (d) F

13	The negation of the statement "6 is greater than 8" is (a) 8 is less than 6 (b) 6 is equal to 8 (c) 6 is not greater than 8 (d) None of these
14	The connective in the statement " $3 + 5 > 9$ or $3 + 5 < 9$ " is (a) $>$ (b) $<$ (c) or (d) and
15	The contrapositive of the statement "If p, then q" is: (a) If q, then $\sim p$ (b) If $\sim p$ , then $\sim q$ (c) If p, then $\sim q$ (d) If $\sim q$ , then $\sim p$
16	If TEMPLE is coded as VHQURL, how would you code CHURCH? (a) EKYWIO (b) EKWUWIO (c) EKVWIN (d) EKYWJO
17	Find the odd man out? (a) 32 : 15 (b) 56 : 26 (c) 86 : 42 (d) 74 : 36
18	Showing a lady in the park, Vineet said, "She is the daughter of my grandfather's only son." How is Vineet related to that lady? (a) Brother (b) Cousin (c) Father (d) Uncle
19	If the sum of n terms of an A.P. is given by $S_n = 3n + 2n^2$ , then the common difference of the A.P. is (a) 3 (b) 2 (c) 6 (d) 4
20	In a G.P. of positive terms, if any term is equal to the sum of the next two terms. Then the common ratio of the G.P. is (a) $\frac{(\sqrt{5}-1)}{2}$ (b) $\frac{(\sqrt{5}+1)}{2}$ (c) $\frac{-\sqrt{5}-1}{2}$ (d) $\frac{\pm\sqrt{5}-1}{2}$
21	If in a G.P., $a_3 + a_5 = 90$ and if $r = 2$ , then the first term of G.P. is ..... (a) 27 (b) 9 (c) $\frac{9}{2}$ (d) $\frac{27}{2}$
22	Which term of the G.P. $2, 1, \frac{1}{2}, \frac{1}{4}, \dots$ is $\frac{1}{1024}$ (a) 10 (b) 12 (c) 14 (d) 16
23	The 3rd term of GP is 4. The product of its first 5 term is (a) $4^3$ (b) $4^4$ (c) $4^5$ (d) None of these
24	If in an A.P. 7th term is 9 and 9th term is 7, then find 16th term. (a) 0 (b) 4 (c) 16 (d) 16

25	A researcher wants to determine whether the circadian temperature cycle is less stable for older compared to middle aged adults. Body temperature in degrees Fahrenheit is measured every 15 minutes over a period of 3 days. Choose the appropriate scale of measurement. (a) Nominal            (b) Ordinal            (c) Interval            (d) Ratio																																																	
26	The third quartile of the data set 33, 25, 42, 25, 31, 37, 46, 29, 38, is ..... (a) 38                    (b) 40                    (c) 42                    (d) 44																																																	
27	The monthly income of 8 persons working in a factory are 170, 210, 140, 360, 100, 250, 150, 290. Find $P_{30}$ income. (a) 141                    (b) 143                    (c) 145                    (d) 147																																																	
28	For the data: 5, 24, 36, 12, 20, and 8, value of $D_5$ is..... (a) 10                    (b) 12                    (c) 14                    (d) 16																																																	
29	Calculate the coefficient of range from the following distribution: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">10 – 15</td> <td style="text-align: center;">15 – 20</td> <td style="text-align: center;">20 – 25</td> <td style="text-align: center;">25 - 30</td> </tr> <tr> <td style="text-align: center;">Frequency</td> <td style="text-align: center;">4</td> <td style="text-align: center;">10</td> <td style="text-align: center;">16</td> <td style="text-align: center;">8</td> </tr> </table> (a) 20                    (b) 30                    (c) 40                    (d) 50	X	10 – 15	15 – 20	20 – 25	25 - 30	Frequency	4	10	16	8																																							
X	10 – 15	15 – 20	20 – 25	25 - 30																																														
Frequency	4	10	16	8																																														
30	The mean derivation of the data 3, 10, 10, 4, 7, 10, 5 from the mean is (a) 2                    (b) 2.57                    (c) 3                    (d) 3.75																																																	
31	The variance for the following frequency distribution table is: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Classes</th> <th style="text-align: center;">Mid-value <math>x_i</math></th> <th style="text-align: center;">Frequency (<math>f_i</math>)</th> <th style="text-align: center;"><math>u_i = \frac{x_i - 25}{10}</math></th> <th style="text-align: center;"><math>f_i u_i</math></th> <th style="text-align: center;"><math>u_i^2</math></th> <th style="text-align: center;"><math>f_i u_i^2</math></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0 – 10</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">-2</td> <td style="text-align: center;">-10</td> <td style="text-align: center;">4</td> <td style="text-align: center;">20</td> </tr> <tr> <td style="text-align: center;">10 – 20</td> <td style="text-align: center;">15</td> <td style="text-align: center;">8</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">-8</td> <td style="text-align: center;">1</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">20 – 30</td> <td style="text-align: center;">25</td> <td style="text-align: center;">15</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">30 – 40</td> <td style="text-align: center;">35</td> <td style="text-align: center;">16</td> <td style="text-align: center;">1</td> <td style="text-align: center;">16</td> <td style="text-align: center;">1</td> <td style="text-align: center;">16</td> </tr> <tr> <td style="text-align: center;">40 – 50</td> <td style="text-align: center;">45</td> <td style="text-align: center;">6</td> <td style="text-align: center;">2</td> <td style="text-align: center;">12</td> <td style="text-align: center;">4</td> <td style="text-align: center;">24</td> </tr> <tr> <td style="text-align: center;"><b>Total</b></td> <td></td> <td style="text-align: center;"><b><math>N = 50</math></b></td> <td></td> <td style="text-align: center;"><b><math>\Sigma f_i u_i = 10</math></b></td> <td></td> <td style="text-align: center;"><b><math>\Sigma f_i u_i^2 = 68</math></b></td> </tr> </tbody> </table> (a) 27                    (b) 32                    (c) 127                    (d) 132	Classes	Mid-value $x_i$	Frequency ( $f_i$ )	$u_i = \frac{x_i - 25}{10}$	$f_i u_i$	$u_i^2$	$f_i u_i^2$	0 – 10	5	5	-2	-10	4	20	10 – 20	15	8	-1	-8	1	8	20 – 30	25	15	0	0	0	0	30 – 40	35	16	1	16	1	16	40 – 50	45	6	2	12	4	24	<b>Total</b>		<b><math>N = 50</math></b>		<b><math>\Sigma f_i u_i = 10</math></b>		<b><math>\Sigma f_i u_i^2 = 68</math></b>
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10 – 20	15	8	-1	-8	1	8																																												
20 – 30	25	15	0	0	0	0																																												
30 – 40	35	16	1	16	1	16																																												
40 – 50	45	6	2	12	4	24																																												
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32	The degree of peakness or flatness of a unimodal distribution is called..... (a) Skewness            (b) Symmetry            (c) Dispersion            (d) Kurtosis																																																	
33	Karl Pearson's coefficient of skewness is 1.28, its mean is 164 and mode 100, then the standard deviation is (a) 30                    (b) 40                    (c) 50                    (d) 60																																																	

34	The set $A = \{x: x \text{ is a real number and } x^2 = 16 \text{ and } 2x = 6\}$ equals (a) $\emptyset$ (b) $\{14, 3, 4\}$ (c) $\{3\}$ (d) $\{4\}$
35	The number of subsets of a set containing 'n' elements is (a) n                      (b) $2^n - 1$ (c) $n^2$ (d) $2^n$
36	Which of the following statement is false: (a) $A - B = A \cap B'$ (b) $A - B = A - (A \cap B)$ (c) $A - B = A - B'$ (d) $A - B = (A \cup B) - B$
37	The domain of the function $f(x) = \sqrt{25 - x^2}$ is (a) $[-5, 5]$ (b) $(-5, 5]$ (c) $[-5, 5)$ (d) $(-5, 5)$
38	For two sets A and B, given $n(A \times B) = 6$ and three of the elements of $A \times B$ are (2, 5), (4, 6) and (8, 6). Then the remaining elements are (a) (2, 4), (4, 8), (5, 6)                      (b) (2, 6), (4, 5), (4, 8) (c) (2, 4), (4, 5), (6, 8)                      (d) (2, 6), (4, 5), (8, 5)
39	Let $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6, 7\}$ , then what is the value of $n[(A \times B) \cap (B \times A)]$ (a) 0                      (b) 4                      (c) 9                      (d) 20
40	Which among the following is not a transitive relation? (a) $R = \{(1,2), (2,3), (1,3)\}$ (b) $R = \{(1,2), (3,4)\}$ (c) $R = \{(1,2), (2,3), (1,1)0\}$ (d) $R = \{(1,1), (2,2), (3,3), (4,4)\}$
<b>Case Study - I</b>	
I	 <p>A party was arranged by Rahul and total 25 people joined the party. Out of 25 people, 12 like to take tea, 15 like to take coffee and 7 like to take coffee and tea both. On the basis of the above information answer the following questions:</p>
41	How many of them like at least one of the two drinks? (a) 25                      (b) 30                      (c) 45                      (d) 20
42	How many of them only like tea but not coffee? (a) 4                      (b) 6                      (c) 5                      (d) 8
43	How many of them like only coffee but not tea? (a) 10                      (b) 12                      (c) 6                      (d) 8
44	How many of them like neither tea nor coffee? (a) 4                      (b) 6                      (c) 5                      (d) 3

45	<p>If the cost of a Tea per cup in the party was Rs 35 and the cost of a Coffee per cup in the party was Rs 75 and it is assumed that each person who like only tea or only coffee have consumed two cups of tea and coffee respectively. Then what was the total cost of Tea and Coffee which was consumed in the party by such persons?</p> <p>(a) 1200                      (b) 1500                      (c) 1555                      (d) 1550</p>
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### Case Study - II

II		<p>In class of Statistics, teacher was discussing the concept of Measures of Correlation, in which he was discussing about Karl Pearson's Coefficient of Correlation. During his class, he discussed the following few points on this:</p>
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This is the best method for finding correlation between two variables provided the relationship between the two variables is linear. This method is also known as product moment correlation coefficient. Pearson's correlation coefficient may be defined as the ratio of covariance between the two variables to the product of the standard deviation of the two variables. If the two variables are denoted by  $x$  and  $y$  and of the corresponding bivariate data are  $(x_i, y_i)$  for  $i = 1, 2, 3, \dots, n$ , then the coefficient of correlation between  $x$  and  $y$  due to Karl Pearson, is given by:

$$r_{xy} = \frac{\text{Cov}(x, y)}{\sqrt{\text{Var } x} \cdot \sqrt{\text{Var } y}}$$

If  $x, y$  are small numbers, we use

$$r = \frac{\Sigma xy - \frac{1}{N} \Sigma x \Sigma y}{\sqrt{\Sigma x^2 - \frac{1}{N} (\Sigma x)^2} \sqrt{\Sigma y^2 - \frac{1}{N} (\Sigma y)^2}}$$

For example: Find Karl Pearson's coefficient of correlation between  $X$  and  $Y$  for the data  
 Following problem was given to students on the same concept: On the basis of the above information, answer the following questions:

X	5	4	3	2	1
Y	4	2	10	8	6

46	<p>Pearson's correlation coefficient may be defined as the ratio of covariance between the two variables to the</p> <p>(a) product of mean deviations                      (b) product of the standard deviations          (c) product of negative correlation                      (d) product of positive correlation</p>
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47	<p>What is the value <math>\Sigma xy</math> in this data?</p> <p>(a) 65                      (b) 70                      (c) 80                      (d) 90</p>
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48	What is the value $\sum x^2$ (a) 40                      (b) 35                      (c) 55                      (d) 45
49	What is the value of $\sum y^2$ (a) 220                      (b) 230                      (c) 195                      (d) 210
50	What is the value of Karl Pearson's Coefficient of Correlation between x and y? (a) 0.2                      (b) -0.5                      (c) -0.2                      (d) 0.5

### Answers Key

1	C
2	B
3	B
4	D
5	A
6	A
7	C
8	D
9	C
10	B

11	C
12	A
13	C
14	C
15	D
16	A
17	B
18	A
19	D
20	A

21	C
22	B
23	C
24	A
25	C
26	B
27	D
28	D
29	D
30	B

31	D
32	D
33	C
34	A
35	D
36	C
37	A
38	D
39	B
40	C

### Case Study Answers

41	D
46	B

42	C
47	C

43	C
48	C

44	C
49	B

45	D
50	A