SET NO.2

DAV PUBLIC SCHOOLS,ODISHA ZONE –I
PA-II EXAMINATION, 2021-22

- **Check that this question paper contains 5 printed pages.**

- **Set number given on the right hand side of the questions paper should be written on the OMR SHEET by the candidate.**

- **Check that this question paper contains 50 questions.**

CLASS: XI (Commerce)
SUB:APPLIED MATHEMATICS (241)

Time: 90 Minutes   **Maximum Marks: 40**

General Instructions:
1. *This question paper contains **three sections – A, B and C**. Each part is compulsory.*
2. ***Section - A** has 20 MCQs, attempt **any 16 out of 20**.*
3. ***Section - B** has 20 MCQs, attempt **any 16 out of 20***
4. ***Section - C** has 10 MCQs, attempt **any 8 out of 10**.*
5. *There is no negative marking.*
6. *All questions carry equal marks.*

SECTION – A
(Section A consists of 20 questions (1 -20) of each 1mark weightage. Any 16 questions are to be attempted. The first attempted 16 questions would be evaluated.)

Q1. The value of $\left[(64)^{2/3} \times 2^{-2} \div 8^0\right]^{-1/2}$ is   1
   (A) 1   (B) ½   (C) 2   (D) 0

Q2. If log x = - 1.2357, then x is equal to   1
   (A) 0.01726   (B) 0.1726   (C) 0.5812   (D) 0.05812

Q3. If 2 men or 3 boys take 40 hours to do a certain piece of work, then 4   1
   men and 9 boys will together complete the work in
   (A) 8 hours   (B) 6 hours   (C) 5 hours   (D) 4 hours

Q4. In 1900 years, the no. of odd days is   1
   (A) 0   (B) 1   (C) 2   (D) 3

Q5. Number of proper subsets of a set containing 4 elements is   1
     (A) 4^2 (B) $4^2 - 1$ (C) 2^4 (D) $2^4 - 1$

Q6. The number of integers between 100 and 1000 that are not divisible by 7   1
are
     (A) 128   (B) 899   (C) 771   (D) 772

Q7. If 9 times the 9th term of an A.P. is equal to 13 times the 13th term, then   1
the 22nd term of the A.P is
     (A) 0   (B) 22   (C) 198   (D) 220

Q8. The minimum value of $4^x + 4^{1-x}, x \in R$ is   1
     (A) 2   (B) 4   (C) 6   (D) 8

Q9. The product of 5 terms of G.P. whose 3rd term is 2 is   1
     (A) 5^2 (B) 2^5 (C) 3^2 (D) 3^5

Q10. The negation of the statement "Aman or Ria lived in Lucknow" is   1
     (A) Aman did not live in Lucknow and Ria lived in Lucknow
     (B) Aman lived in Lucknow and Ria did not live in Lucknow
     (C) Aman did not live in Lucknow and Ria did not live in Lucknow
     (D) Aman did not live in Lucknow or Ria did not live in Lucknow.

Q11. If SPIDER is written as PSDIRE, COMMON would be written as   1
     (A) ZRHRNO   (B) OCMMNO   (C) ZRMMPQ   (D) none
of these

Q12. The contra positive of the statement " If p then q" is   1
     (A) If q then p   (B) If ~q then ~p   (C) If p then ~q   (D) If ~p
then ~q

Q13 The domain of the function f defined by $f(x) = \sqrt{x^2 - 9}$ is   1
     (A) [-3, 3]   (B) (-3, 3)   (C) $(-\infty, -3] \cup [3, \infty)$ (D) [0, 3]

Q14 If $f(x) = px + q$, where p and q are integers, $f(-1) = 1$ and $f(2) = 13$, then   1
p and q are
     (A) p = 4, q = 5   (B) p = -4, q = 5   (C) p = -4, q = -5   (D) p = 4, q = -5

Q15 The variance of the first 5 natural numbers is   1
     (A) 1   (B) 2   (C) 3   (D) 4

Q16 City of birth is an example of a/an   1
     (A) Nominal scale   (B) Ordinal scale   (C) Interval scale   (D) Ratio scale

Q17 The mean deviation about the median of the data: 3, 6 ,11, 12, 18 is   1
     (A) 1.2   (B) 2.2   (C) 3.2   (D) 4.2

Q18 Skewness is a measure of   1
     (A) Peakedness   (B) Central tendency   (C) Symmetry   (D)
Dispersion.

Q19 The first four central moments of a frequency distribution are 0, 2.4, 0.6   1
and 17.25. Then the curve is
     (A) Leptokurtic   (B) Mesokurtic   (C) Platykurtic   (D) none of these

Q20 To visually examine the relation between two quantitative variables, one   1
must use
     (A) Bar graphs   (B) Pie charts   (C) Histograms   (D) Scatter plots

SECTION – B

(Section A consists of 20 questions (21 – 40) of each 1mark weightage. Any 16 questions are to be attempted. The first attempted 16 questions would be evaluated.)

Q21 If $a+ib=\dfrac{(x+1)^2}{2x-i}$, then a^2+b^2 is equal to   1

(A) $\dfrac{(x+1)^4}{4x^2-1}$ (B) $\dfrac{(x+1)^2}{4x^2+1}$ (C) $\dfrac{(x+1)^4}{4x^2+1}$ (D) $\dfrac{(x+1)^2}{4x^2-1}$

Q22 If $\log_{\sqrt[3]{5}} x = -3$, then the value of x is   1

(A) 1/5   (B) – 1/5   (C) -1   (D) 5

Q23 The average of 19 observations is 54. If the average of first 10 observations is 56 and that of last 10 observations is 53, then the 10th observation is   1

(A) 54   (B) 56   (C) 64   (D) 66

Q24 A cuboid container has the capacity to hold 50 small boxes. If all the dimensions of the container are doubled, then it can hold (small boxes of same size)   1

(A) 100 boxes   (B) 200 boxes   (C) 400 boxes   (D) 800 boxes

Q25 If A = {- 2, - 1, 0, 1, 2} and $f:A\to Z$ be given by $f(x)=x^2-2x-3$, then the pre – image/images of 5 are   1

(A) – 2, 4   (B) - 2   (C) 4   (D) none of these

Q26 If R is a relation on Z (set of integers) defined by x R y if $|x-y|\le 1$, then R is   1

(A) reflexive and symmetric   (B) symmetric and transitive
(C) reflexive and transitive   (D) equivalence relation

Q27 Which of the following pairs are logically equivalent?   1
(A) Conditional, Contra positive   (B) Conditional, Inverse
(C) Contra positive, Converse   (D) Inverse, Contra positive

Q28 Mohan said, "This girl is the wife of the grandson of my mother". Mohan is girl's   1
(A) Brother   (B) Uncle   (C) Father-in-law   (D) son

Q29 The statement $p\Rightarrow p\vee q$ is   1
(A) a tautology   (B) a contradiction   (C) neither (A) nor (B)   (D) None

Q30 If $f(x)=x^2-3x+4$, then the values of x satisfying $f(x)=f(2x+1)$ are   1
(A) 1, 2   (B) -1, 2   (C) -1, 2/3   (D) 1, 2/3

Q31 The domain of definition of the function $f(x)=\log|x|$ is   1
(A) R   (B) $(-\infty,0)$ (C) $(0,\infty)$ (D) R – {0}

Q32 The range of the function is $f(x)=2-|x-5|$ is   1
(A) $(-\infty,1]$ (B) $(-\infty,2]$ (C) $(-\infty,1)$
   (D) $(-\infty,2)$

Q33 If Karl Pearson's coefficient of skewness of a distribution is 2.5, standard deviation is 8 and mean is 30, then mode of the distribution is   1
(A) 25   (B) 10   (C)20   (D) 5

Q34 Percentile rank refers to 1
(A) the percentage of scores that fall above a certain score
(B) the percentage of scores that fall at or above a certain score
(C) the percentage of scores that fall at or below a certain score
(D) the percentage of scores that equal a certain score

Q35 The coefficient of correlation 'r' satisfies 1
(A) $r > 1$ (B) $r \leq -1$ (C) $-1 < r < 1$ (D) $-1 \leq r \leq 1$

Q36 If $\sum u_i v_i = 50$ and n = 15 where u_i and v_i are deviations of X and Y series 1
from their respective mean, then Cov(X,Y) is
(A) 2.43 (B) 3.33 (C) 3.24 (D) 3.63

Q37 If $\bar{x}$ is the mean of n observations $x_1, x_2, x_3 \ldots, x_n$, then the value of $\sum_{i=1}^{n}(x_i - \bar{x})$ is 1

(A) -1 (B) 0 (C) 1 (D) n - 1

Q38 The median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54, 84 is 1
(A) 45 (B) 49.5 (C) 54 (D) 56

Q39 If the standard deviation of a set of observations is 8 and each observation 1
is divided by -2, then the standard deviation of the new set of observations
will be
(A) - 4 (B) - 8 (C) 8 (D) 4

Q40 For any frequency distribution, the Kurtosis is 1
(A) Greater than 1 (B) less than 1 (C) equal to 1 (D) None

SECTION – C

(Section C consists of 10 questions (41-50) of each 1mark weightage. Any 08 questions
are to be attempted. Questions 46 – 50 are based on a Case- Study. The first attempted
08 questions would be evaluated.)

Q41 A car travels for 2 hours at a speed of 40 km/h and then travels at 50 1
km/h for next 2 hours. The average speed of the car is
(A) 45 km/h (B) 44.4 km/h (C) 47 km/h (D) 48 km/h

Q42 The binary equivalent of the decimal number $(24)_{10}$ is 1
(A) $(1101111)_2$ (B) $(11000)_2$ (C) $(111111)_2$ (D) $(11001)_2$

Q43 ABC is an isosceles right angled triangle with $\angle ABC = 90°$. A semicircle is 1
drawn with AC as diameter. If AB = BC = 7 cm, then the area of the
shaded region taking $\pi = \frac{22}{7}$ is
(A) 4 cm^2 (B) 7 cm^2 (C) 14 cm^2 (D) 28 cm^2
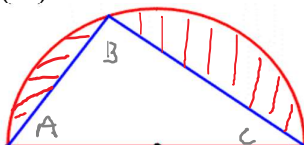
Q44 Find the odd one out: BAKE, PEEL, FRY, BOIL, ROAST 1
(A) BOIL (B) PEEL (C) ROAST (D) FRY

Q45 The difference between the highest and lowest values of the observations 1
is called
(A) Frequency (B) Mean (C) Class- intervals (D) Range

CASE STUDY

In a survey of 40 students, it was found that 21 had taken Mathematics,16 had taken Physics,15 had taken Chemistry, 7 had taken Mathematics and Chemistry, 12 had taken Mathematics and Physics, 5 had taken Physics and Chemistry and 4 had taken all the three subjects

Based on the given information, answer the following questions:-

Q46 **The number of students who had taken Mathematics only is**   1
(A) 5   (B) 6   (C) 7   (D) 8

Q47 **The number of students who had taken Physics and Chemistry but not**   1
Mathematics is
(A) 1   (B) 3   (C) 5   (D) 7

Q48 **The number of students who had taken exactly one of the three subjects is**   1
(A) 12   (B) 14   (C) 16   (D) 18

Q49 **The number of students who had taken at least one of the three subjects is**   1
(A) 40   (B) 38   (C) 34   (D) 32

Q50 **The number of students who had taken none of the three subjects is**   1
(A) 8   (B) 6   (C) 2   (D) 0

****************** **ALL THE BEST** ******************