

SAMPLE PAPER -1

DAV – AKT DEFENCE SERVICES PREPARATORY ACADEMY

KALLAKURICHI, Dist. KALLAKURICHI. TAMIL NADU- 600213

DSPA- ENTRANCE EXAMINATION – 2023 (ONLINE)

Marks: 160

Time: 3 hours (2+1 hr)

INSTRUCTIONS:

- (i) This online test comprises 80 Questions in 2 parts. (10th std. level)
Part-A (50 questions) which includes -Mathematics – 20, Science -13, social science-10, GK-7.
Part-B (30 questions) – Mental Ability-30 which will have to be attended separately after completing Part-A.
- (ii) Choose the right answer from the FOUR options given for each question.
- (iii) Each question carries 2 marks.
- (iv) **0.5 mark will be deducted for every wrong answer (Negative marking).**
- (v) Questions not attempted will be marked '0'.
- (vi) Ensure good internet and uninterrupted connectivity.
- (vii) 'SUBMIT' button to be clicked only at the end of the examination- Part-A and Part-B separately. **There is no option to change the answer after submission.**

NOTE : Absolute honesty is expected during the online exam.

(ANY MALPRACTICE OR TAKING EXTERNAL HELP WILL BE IDENTIFIED DURING THE PERSONAL INTERVIEW WHICH WILL LEAD TO DISQUALIFICATION, IF ESTABLISHED).

PART -1

Mathematics

Q.1) If $777x + 666y = 1332$ & $666x + 777y = 111$; then the value of $x + y$ is

[1] 1

[2] 2

[3] 3

[4] 4

Q.2) The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and the 15 as remainder. What is the smaller number?

- [1] 240
- [2] 270
- [3] 295
- [4] 360

Q.3) A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?

- [1] 34%
- [2] 44%
- [3] 54%
- [4] 64%

Q.4) Two dice are tossed. The probability that the total score is a prime number is:

- [1] $\frac{1}{6}$
- [2] $\frac{5}{12}$
- [3] $\frac{1}{2}$
- [4] $\frac{7}{9}$

Q.5) A Navy captain going away from a lighthouse at the speed of $4(\sqrt{3} - 1)$ m/s. He observes that it takes him 1 minute to change the angle of elevation of the top of the lighthouse from 60° to 45° . What is the height (in metres) of the lighthouse?

- [1] $240\sqrt{3}$
- [2] $280\sqrt{3}$
- [3] $480(\sqrt{3} - 1)$
- [4] $360\sqrt{3}$

Q.6) The length of one side of a rhombus is 41 cm and its area is 720 sq.cm. What is the sum of the lengths of its diagonals?

- [1] 82 cm
- [2] 90 cm
- [3] 98 cm

[4] 80 cm

Q.7) If the 10th term of the sequence $a, a-b, a-2b, a-3b, \dots$ is 20 and its 20th term is 10, then its x^{th} term is

[1] $20 - x$

[2] $25 + x$

[3] $25 - x$

[4] $30 - x$

Q.8) The altitude AD of a $\triangle ABC$ in which $\angle A$ is obtuse and $AD=10\text{cm}$. If $BD=10\text{cm}$ and $CD=10\sqrt{3}\text{cm}$, then $\angle A$ is

[1] 110°

[2] 120°

[3] 105°

[4] 100°

Q.9) A train moving at speed of 90 km/hr crosses a pole in 7 seconds. Find the length of the train.

[1] 150 m

[2] 165 m

[3] 175 m

[4] 170 m

Q.10) A 60 liters mixture of milk and water contains 10% water. How much water must be added to make water 20% in the mixture?

[1] 8 liters

[2] 7.5 liters

[3] 7 liters

[4] 6.5 liters

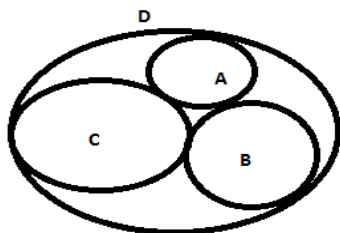
Q.11) The angle of elevation of the top of an unfinished building at point P which is 120 m away from its base is 30° . If the angle of elevation of the finished building at the same point would be 60° , find the height of the remaining part of the building

- [1] $70\sqrt{3}$ m
- [2] $75\sqrt{3}$ m
- [3] $80\sqrt{3}$ m
- [4] $85\sqrt{3}$ m

Q.12) A hollow sphere of internal and external diameters 4 cm and 8 cm respectively is melted to form a solid cylinder of base diameter 8 cm. What is the height of the cylinder?

- [1] 4.5 cm
- [2] 4.57 cm
- [3] 4.67 cm
- [4] 4.7 cm

Q.13) Circles A, B, C and D intersect each other at exactly one point



Circles A and B are congruent. Circle C has radius 1 unit and passes through the centre of the circle D. Then the radius of the circle B is

- [1] $\frac{2}{3}$ units
- [2] $\frac{8}{9}$ units
- [3] $\frac{4}{5}$ units
- [4] $\frac{1}{2}$ unit

Q.14) Let x and y be real numbers satisfying $x^4 - y^5 + y^4x^5 = 210$ and $x^3y^6 + y^3x^6 = 945$. Then the value of $2x^3 + x^3y^3 + 2y^3$ is

- [1] 89
- [2] 45

[3] 91

[4] 51

Q.15) The solution of $3(5x) + 5(3x) = 510$ is

[1] 2

[2] 3

[3] 4

[4] 5

Q.16) The volume of a hollow cube is 216cm^3 . What surface area of the largest sphere which be enclosed in it?

[1] 18π sq.cm

[2] 36π sq.cm

[3] 27π sq.cm

[4] 72 sq. cm

Q.17) One-fourth of a herd of cows are in the forest. Twice the square root of the herd has gone to mountains and the remaining 15 are on the banks of the river. Find the total number of cows

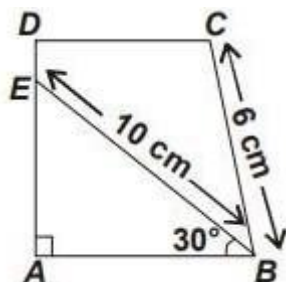
[1] 26

[2] 100

[3] 36

[4] 63

Q.18) In the given figure, length of AE= _____.



[1] 4 cm

[2] 5 cm

[3] 6 cm

[4] 8 cm

Q.19) In what ratio must rice at D 7.20 per kg be mixed with ice at D 5.70 per kg so that the worth D 6.30 per kg.

[1] 1:3

[2] 2:3

[3] 3:4

[4] 4:5

Q.20) Subhash purchased an audio set at $\frac{9}{10}$ of its selling price and sold it at 8% more than its selling price. What is the gain percentage in this transaction?

[1] 8%

[2] 10%

[3] 18%

[4] 20%

SCIENCE

Q.1) An object kept at a distance of 18cm, 10cm, 22cm and 30 cm from a lens of power + 5 D. In which case or cases would you get a real magnified image.

[1] 18 cm & 10cm

[2] 10 cm & 22 cm

[3] 18 cm & 30 cm

[4] 22cm & 30 cm

Q.2) A spherical mirror and a spherical lens each have a focal length of +20 cm. The mirror and the lens are likely to be

[1] the mirror is concave and the lens is concave

[2] the lens is convex and the mirror also is concave

[3] the mirror is convex and the lens is convex

[4] the mirror is convex and the lens is concave

Q.3) The following readings were recorded for object distance 'u' and image distance 'v' in the case of a converging lens having power +5 D. Identify the wrong set of reading

U (cm)	30	35	45	55
V (cm)	60	37	35	30
	set I	set II	set III	set IV

[1] III

[2] I

[3] IV

[4] II

Q.4) In refraction through a prism, when the angle of incidence becomes equal to the angle of emergence, then

[1] the refracted ray travels parallel to the base of the prism

[2] the refracted ray travels perpendicular to the base of the prism

[3] the angle of deviation becomes minimum

[4] the refracted ray travels parallel to the base of the prism and the angle of deviation becomes minimum

Q.5) The minimum distance between an object and its real image formed by a concave mirror of focal length 10 cm is

[1] 10 cm

[2] 20 cm

[3] Zero

[4] 5 cm

Q.6) Light travels from air to a glass slab of thickness 10 cm. If the refractive index of the glass slab is 1.5, then find the time taken by the light to traverse the thickness of the glass slab.

[1] $5 \times 10^{10} \text{ s}$

[2] $2 \times 10^{-10} \text{ s}$

[3] $5 \times 10^8 \text{ s}$

[4] $5 \times 10^{-10} \text{ s}$

Q.7) A convex lens A of focal length 20cm and a concave lens B of focal length 5cm are kept along the same axis with a distance 'd' between them. If a parallel beam of light falling on A leaves B as a parallel beam, then the distance 'd' in cm will be

- [1] 25 cm
- [2] 15 cm
- [3] 10 cm
- [4] 40 cm

Q.8) A person is in a room where the ceiling and 2 adjacent walls are mirrors. The number of images formed are

- [1] 5
- [2] 6
- [3] 7
- [4] 8

Q.9) Four students tested the three given solutions A, B and C with indicators and noted down the colour changes. As per their observation,

Solution A gave pink colour with Phenolphthalein,

Solution B gave pinkish red colour with Methyl orange and

Solution C gave blue colour with Litmus solution.

The results given by the four students are tabulated below. Which student gave the correct answer?

	Name of the student	RESULT
a)	RAVI	A and B are acidic & C is basic
b)	RAM	A and C are basic & B is acidic
c)	RAJU	B and C are acidic & A is basic
d)	RAGHAV	A, B and C are basic

- [1] RAVI
- [2] RAM
- [3] RAJU
- [4] RAGHAV

Q.10) Which of the following statements regarding plaster of Paris and Gypsum are true?

- A) Plaster of Paris with water gives Gypsum
- B) Gypsum with water gives Plaster of Paris.
- C) Plaster of Paris on heating gives gypsum.
- D) Gypsum on heating gives Plaster of Paris.

- [1] A and C
- [2] B and D
- [3] A and D
- [4] B and C

Q.11) A solution of sodium hydroxide contains

- [1] Na^+ and OH^- ions
- [2] Na^+ and H_3O^+ ions
- [3] OH^- , H^+ and H_3O^+ ions
- [4] Na^+ , OH^- and H_3O^+ ions

Q.12) ASSERTION: Copper sulphate solution is acidic in nature.

REASON: Copper sulphate is the salt obtained from strong acid and strong base.

- [1] Both A and R are true
- [2] A is true and R is false.
- [3] A is false and R is true.
- [4] Both A and R are false.

Q.13) ASSERTION: Zinc oxide is neither an acidic nor a basic oxide.

REASON: It reacts with both acids and bases to form salt and water.

- [1] A is false and R is true.
- [2] A is true and R is false.
- [3] Both A and R are true.
- [4] Both A and R are false.

SOCIAL SCIENCE

- Q.1) The main function of the Prussian Zollverein was to
- [1] Impose custom duties
 - [2] Abolish tariff barriers
 - [3] Reduce custom duties
 - [4] Introduce new rules for trade.
- Q.2) Who presided over the Lahore session of Congress in 1929.
- [1] Motilal Nehru
 - [2] Mahatma Gandhi
 - [3] C.R.Das
 - [4] Jawaharlal Nehru
- Q.3) Why did the British manufacturers use calendars for advertisements?
- [1] Indians were fond of calendars
 - [2] It adds beauty to the room.
 - [3] Calendars were seen as a more effective means of advertisement.
- Q.4) Why is the Buxa Tiger Reserve in West Bengal threatened?
- [1] Industrialisation
 - [2] Agricultural expansion.
 - [3] Port activities
 - [4] Mining.
- Q.5) Specialized cultivation of fruits and vegetables is called:
- [1] Horticulture
 - [2] Pisciculture
 - [3] Sericulture
 - [4] Apiculture
- Q.6) Body Mass Index of a person is calculated by
- [1] dividing person's weight by the cube of height in meters.
 - [2] dividing person's weight by the cube of height in centimeters
 - [3] dividing person's weight by the square of height in meters
 - [4] dividing person's weight by the square of height in centimeters
- Q.7) The Apex institution that monitors the monetary system in India is
- [1] The Central Bank
 - [2] The Reserve Bank of India
 - [3] The Prime Minister
 - [4] The Parliament.

Q.8) In a SHG most of the decisions regarding savings and loan activities are taken by

- [1] Banks
- [2] N.G.O
- [3] Members
- [4] RBI

Q.9) Tax on import is an example of:

- [1] Collateral
- [2] Terms of Credit
- [3] Foreign trade
- [4] Trade barriers

Q.10) Match the following

- | | |
|--------------------------|-------------------|
| a) National Defense | 1 State List |
| b) Trade | 2 Concurrent List |
| c) Education. | 3 Urban areas |
| d) Municipal Corporation | 4 Union List |

- [1] a-3, b-4, c-1, d-2
- [2] a-2, b-1, c-4, d-1
- [3] a-3, b-1, c-2, d-4
- [4] a-4, b-1, c-2; d-3

General Knowledge

Q.1) Match List-I with List-II and choose the correct code from the given codes

	List-I		List-II
1	Permanent Chairman of the Constituent Assembly	(i)	B. N. Rao
2	Legal Adviser of the Constituent Assembly	(ii)	<u>Dr. Rajendra Prasad</u>
3	Chairman of the Constituent Assembly	(iii)	<u>Sachchidanand Sinha</u>
4	Temporary Chairman of the Drafting Committee	(iv)	<u>Dr. Bhim Rao Ambedkar</u>

- | | 1 | 2 | 3 | 4 |
|-----|-------|-------|-------|-------|
| [1] | (i) | (ii) | (iii) | (iv) |
| [2] | (ii) | (i) | (iv) | (iii) |
| [3] | (iii) | (iv) | (i) | (ii) |
| [4] | (iv) | (iii) | (ii) | (i) |

Q.2) The World Trade Organization was established on _____

- [1] 1st January, 1935
- [2] 1st April, 1935
- [3] 1st January, 1995
- [4] 1st April, 1995

Q.3) Which of the following rivers falls in the Arabian Sea?

- [1] Tapti
- [2] Krishna
- [3] Kaveri
- [4] Mahanadi

Q.4) Rule 49 - O describes _____

- [1] Transparency of the election proceedings
- [2] Conduct of free and fair election
- [3] Auditing procedure of the expenditure incurred by the contesting party
- [4] Not willing to elect any candidate

Q.5) Who is appointed according to Article 216?

- [1] Chief Justice of High Court
- [2] Chief Justice of India
- [3] President
- [4] Prime Minister

Q.6) The leading Solar Power producing state in India in 2021 is ____

- [1] Rajasthan
- [2] Uttar Pradesh
- [3] Tamil Nadu
- [4] Kerala

Q.7) POCSO Act was passed in the year _____.

- [1] 2012
- [2] 2009
- [3] 2010
- [4] 2011

PART- B

MENTAL ABILITY (30 x2=60)

Q.1) If $5\#6=121$ and $10\#8=324$, then find the value of $23\#14=?$

- [1] 1369
- [2] 1349
- [3] 1331
- [4] 725

Q.2) Today is Thursday. The day after 59 days will be?

- [1] Monday
- [2] Tuesday
- [3] Saturday
- [4] Sunday

Q.3) Complete the series by replacing '?' Mark G4T, J9R, M20P, P43N, S90L, '?'

- [1] S90L
- [2] V185J
- [3] M20P
- [4] P43N

Q.4) In the given series 18, 21, 26, 35, 52, 85, _____ what is the missing number?

- [1] 150
- [2] 151
- [3] 116
- [4] 115

Q.5) In a row of students a boy is 12th from the left end and 18th from the rightend. The total number of students in the row is a /an

- [1] Prime number
- [2] Composite number
- [3] Even number
- [4] none of these

Q.6) If “–” means “x”, “x” means “+”, “+” means “÷”, “÷” means “–”, thenanswer the following

[qn.6 &7]

Q.36) $8+4-3 \times 2 \div 1 =$ -----

- [1] 8
- [2] 7
- [3] 22
- [4] 21

Q.7) $12 \times 8 + 2 - 4 \div 6 =$ -----

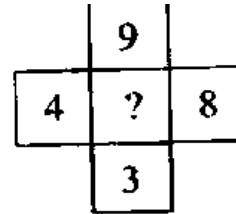
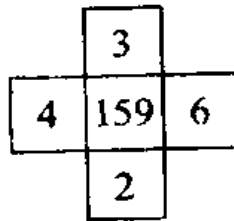
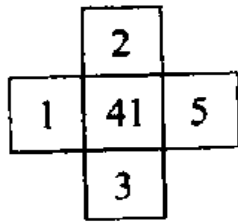
- [1] 7
- [2] 16
- [3] 18
- [4] 22

Q.8) Find the value of ‘?’ from the options given below

72	24	6
96	16	12
108	?	18

- [1] 12
- [2] 16
- [3] 18
- [4] 12

Q.9) Select the missing number from the given responses



[1] 848

[2] 788

[3] 888

[4] 842

Q.10) Arrange the following words in a sequence, in which they occur in the dictionary and then choose the correct sequence

(1) Preach (2) Praise (3) Precinct (4) Precept (5) Precede

[1] 2, 1, 5, 4, 3

[2] 2, 1, 3, 4, 5

[3] 2, 5, 1, 4, 3

[4] 1, 2, 5, 4, 3

Q.11) Arun said "This girl is the wife of grandson of my mother". How is Arun related to the girl?

[1] Father

[2] Grand-father

[3] Husband

[4] Father-in-law

Q.12) Three of the following four are alike in a certain way and hence form a group. Which is the one that does not belong to that group?

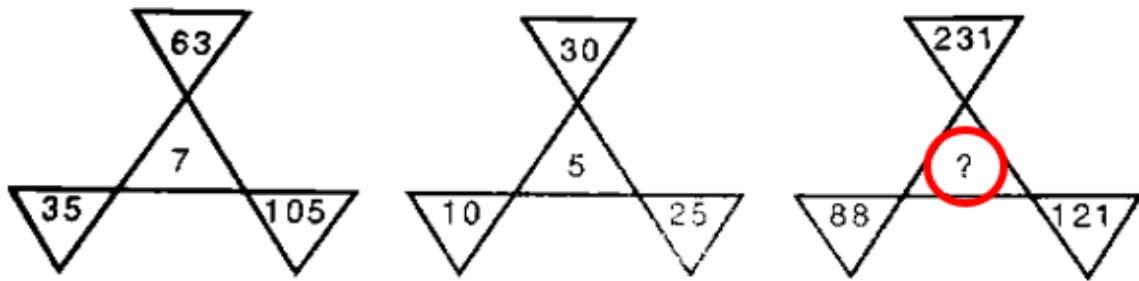
[1] 75

[2] 85

[3] 95

[4] 115

Q.13) Find the missing number “?”



- [1] 2
- [2] 3
- [3] 5
- [4] 11

Q.14) Some translated words in an artificial language [in which the word order is not necessarily same] are given below

- (i) mie pie sie → good person sing
- (ii) pie sie rie → sing good lyrics
- (iii) tie rie sie → love good lyrics

What is the translation for “person love lyrics”?

- [1] pie tie rie
- [2] tie rie sie
- [3] rie mie tie
- [4] sie mie pie

Q.15) Find the missing number in the following table

3	8	10	2	?	1
6	56	90	2	20	0

- [1] 0
- [2] 3
- [3] 5
- [4] 7

Q.16) MTH, QRK, UPN, YNQ?

[1] CKT

[2] CLT

[3] ELT

[4] EKT

Q.17) B3M, E7J, H15G, K31D?

[1] N65A

[2] O63A

[3] N63A

[4] N63Z

Q.18) B2E, D5H, F12K, H27N,?

[1] J58Q

[2] J56Q

[3] J57Q

[4] J56P

Q.19) 6C7, 8F10, 11J14, 15O19, ?

[1] 19U24

[2] 20U25

[3] 19U25

[4] 20U24

Q.20) 5X9, 8U12, 11R15, 14O18, ?

[1] 17L21

[2] 17K21

[3] 17M21

[4] 17L23

Q.21) How many even numbers are there in the below sequence which are immediately preceded by an odd number and immediately followed by an even number?

5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6

[1] 1

[2] 2

[3] 3

[4] 4

Q.22) Nitin was counting down from 31. Sumit was counting upwards, the numbers starting from 1 and he was calling out only the odd numbers. What common number will they call out at the same time if they were calling out at the same speed?

[1] 19

[2] 21

[3] 22

[4] 23

Q.23) If $A + D > C + E$, $C + D = 2B$ and $B + E > C + D$, it necessarily follows that

[1] $A + B > 2D$

[2] $B + D > C + E$

[3] $A + D > B + E$

[4] $A + D > B + C$

Q.24) Find the value of?

6	18	15
3	2	5
4	3	?
8	27	9

[1] 11

[2] 6

[3] 3

[4] 2

Q.25) If the alphabets were written in the reverse order, which letter will be the fifth letter to the right of the fourteenth letter from the left.

[1] R

[2] I

[3] S

[4] H

Q.26) In answering the question below, use the following information

$X \cup Y$ means divide X by Y,

$X \uparrow Y$ means multiple X by Y,

$X \# Y$ means subtract Y from X,

$X \cap Y$ means add Y to X

One-fifth of one-tenth of two-third of a number X is given by

[1] $X \uparrow [1 \cup 5] \uparrow [1 \cup 10] \uparrow [2 \cup 3]$

[2] $[X \cap 1 \uparrow 5] [1 \uparrow 10] [2 \uparrow 3]$

[3] $[X \cap 1 \uparrow 5] [2 \uparrow 10] [2 \uparrow 3]$

[4] can't be determined

Q.27) Mohit was looking for his father. He went 90 metres in the East before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not there. From here he went 100 metres to the North before meeting his father in a street. How far did the son meet his father from the starting point?

(1) 80 metres

(2) 100 metres

(3) 180 metres

(4) 160 metres

Q.28). If Southeast becomes North, Northeast becomes West and so on, what will West become ?

- (1) Northeast
- (2) Northwest
- (3) Southeast
- (4) South

Q.29) Pointing to a lady in the photograph, Shaloo said, "Her son's father is the soninlaw of my mother."How is Shaloo related to the lady ?

- (1) Aunt
- (2) Sister
- (3) Mother
- (4) Cousin

Q.30). Each of these letters gets a numerical value based on its position in M K K I D N E T T Q O B F H A A G T U U X W L S R I, such as, 1 for M, 2 for K, 4 for I and so on. What is the sum of the values of the group of letters ARM ?

- (1) 32
- (2) 33
- (3) 41
- (4) 35