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Exam Paper Code : ADA2215

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1. If  $A = \{1, 2, 3\}$  find  $n\{P(A)\}$   
(a) 3 (b) 6 (c) 8 (d) 9
2. If  $a + ib = \sqrt{\frac{1+i}{1-i}}$  then the value of  $a^2 + b^2 = ?$   
(a) 0 (b)  $\frac{1}{\sqrt{2}}$  (c)  $\sqrt{2}$  (d) 1
3. If  $x = (a + b)$ ,  $y = (aw + bw^2)$  and  $z = (aw^2 + bw)$  then the Value of  $x.y.z = ?$  Where  $w$  is cube root of unity.  
(a)  $(a + b)^3$  (b)  $(a - b)^3$  (c)  $a^3 - b^3$  (d)  $a^3 + b^3$
4. The third term of a GP is 3. What is the Product of the first five terms.  
(a) 216 (b) 226 (c) 243 (d) 245
5. What is the fifth term of an AP of  $n$  terms whose sum is  $n^2 - 2n$ .  
(a) 5 (b) 7 (c) 8 (d) 15
6. The total number of 5-digit number that can be Composed of distinct digits from 0 to 9 is .  
(a) 45360 (b) 30240 (c) 27216 (d) 151
7. If  $\alpha$  and  $\beta$  are the roots of the equation  $ax^2 + bx + c = 0$  where  $a \neq 0$  then  $(a\alpha + b).(a\beta + b)$  is equal to.  
(a)  $ab$  (b)  $bc$  (c)  $ca$  (d)  $abc$
8. In the expansion of  $(1+x)^{43}$  if the coefficient of  $(2r+1)^{th}$  and  $(r+2)^{th}$  terms are equal then what is the value of  $r$  and  $(r \neq 1)$ .  
(a) 14 (b) 5 (c) 21 (d) 22
9. What is the order of  $\begin{bmatrix} a & h & g \\ xyz & h & b & f \\ g & f & c \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$   
(a)  $3 \times 1$  (b)  $1 \times 1$  (c)  $1 \times 3$  (d)  $3 \times 3$
10. If  $A = \begin{bmatrix} 2 & 7 \\ 1 & 5 \end{bmatrix}$  then what is  $A + 3A^{-1}$  equal to.  
(a) 3 I (b) 5 I (c) 7 I (d) 8 I  
where I is identity matrix of order 2.
11. If  $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$  and  $|A^3| = 125$  then  $\alpha$  is equal to.  
(a)  $\pm 1$  (b)  $\pm 2$  (c)  $\pm 3$  (d)  $\pm 5$
12. If  $\tan \theta = \frac{1}{2}$  and  $\tan \phi = \frac{1}{3}$  then what is the value of  $(\theta + \phi)$   
(a) 0 (b)  $\frac{\pi}{4}$  (c)  $\frac{\pi}{6}$  (d)  $\frac{\pi}{2}$
13.  $\frac{\sin 5x - \sin 3x}{\cos 5x + \cos 3x}$  is equal to  
(a)  $\tan x$  (b)  $\sin x$  (c)  $\cot x$  (d)  $\cos x$
14. The value of  $\sin^{-1}\left(\frac{3}{5}\right) + \tan^{-1}\left(\frac{1}{7}\right)$  is equal to.  
(a) 0 (b)  $\frac{\pi}{4}$  (c)  $\frac{\pi}{3}$  (d)  $\frac{\pi}{2}$

15. What is the distance between the straight lines  $3x + 4y = 9$  and  $6x + 8y = 15$ .
- (a)  $\frac{3}{2}$  (b)  $\frac{3}{10}$   
(c) 6 (d) 5
16. If the centroid of triangle formed by  $(7, x)$ ,  $(y, -6)$  and  $(9, 10)$  is  $(6, 3)$  then the value of  $x$  and  $y$  are respectively.
- (a) 5, 2 (b) 2, 5  
(c) 1, 0 (d) 0, 0
17. What is the radius of the circle passing through the point  $(2, 4)$  and having centre  $x - y = 4$  and  $2x + 3y + 7 = 0$ ?
- (a) 3 units (b) 5 units  
(c)  $3\sqrt{3}$  units (d)  $5\sqrt{2}$  units
18. What is the equation of the ellipse whose vertices are  $(\pm 5, 0)$  and foci are at  $(\pm 4, 0)$ ?
- (a)  $\frac{x^2}{25} + \frac{y^2}{9} = 1$   
(b)  $\frac{x^2}{16} + \frac{y^2}{9} = 1$   
(c)  $\frac{x^2}{25} + \frac{y^2}{16} = 1$   
(d)  $\frac{x^2}{9} + \frac{y^2}{25} = 1$
19. If  $f(x) = x^2$  then what is the value of  $[f \circ (f \circ f)](2)$ .
- (a) 2 (b) 8  
(c) 16 (d) 256
20.  $\lim_{x \rightarrow 10} \frac{1 - \cos^3 4x}{x^2}$  is equal to
- (a) 0 (b) 12  
(c) 24 (d) 36
21. If  $y = e^{x^2} \cdot \sin 2x$  then what is  $\frac{dy}{dx}$  at  $n = \pi$  equal to?
- (a)  $(1 + \pi)e^{\pi^2}$  (b)  $2 \cdot e^{\pi^2}$   
(c)  $2\pi e^{\pi^2}$  (d)  $e^{\pi^2}$
22. If  $x = a(\cos \theta + \theta \sin \theta)$  and  $y = a(\sin \theta - \theta \cos \theta)$  what is  $\frac{d^2 y}{dx^2}$  equal to
- (a)  $\sec^2 \theta$  (b)  $-\cos \sec^2 \theta$   
(c)  $\frac{\sec^3 \theta}{a\theta}$  (d) None of these
23. If a function  $f(x) = \left(\frac{1}{x}\right)^{2x^2}$  where  $x > 0$  at what value of  $x$  does the function attain maximum value?
- (a)  $e$  (b)  $\sqrt{e}$   
(c)  $\frac{1}{\sqrt{e}}$  (d)  $\frac{1}{e}$
24. What is  $\int \tan^{-1}(\sec x + \tan x) dx$  equal to?
- (a)  $\frac{\pi x}{4} + \frac{x^2}{4} + c$   
(b)  $\frac{\pi x}{2} + \frac{x^2}{4} + c$   
(c)  $\frac{\pi x}{4} + \frac{\pi x^2}{4} + c$   
(d)  $\frac{\pi x}{4} - \frac{x^2}{4} + c$
25.  $\int_0^{\pi/2} \frac{dx}{a^2 \cos^2 x + b^2 \sin^2 x}$  equal to ?
- (a)  $2ab$  (b)  $\frac{\pi}{2ab}$   
(c)  $2\pi ab$  (d)  $\frac{\pi}{ab}$
26. The area banded by the Co-ordinate axes and the Curve  $\sqrt{x} + \sqrt{y} = 1$  is :
- (a)  $\frac{1}{3}$  unit<sup>2</sup> (b) 1 unit<sup>2</sup>  
(c) 2 unit<sup>2</sup> (d)  $\frac{1}{6}$  unit<sup>2</sup>
27. What is the Solution of the differential equation  $\log_e \left( \frac{dy}{dx} \right) = ax + by$ ?
- (a)  $ae^{ax} + be^{by} = c$   
(b)  $\frac{1}{a}e^{ax} + \frac{1}{b}e^{by} = c$   
(c)  $ae^{ax} + be^{-by} = c$   
(d)  $\frac{1}{a}e^{ax} + \frac{1}{b}e^{-by} = c$
28. A unit Vector perpendicular to each of the vectors  $2\hat{i} - \hat{j} + \hat{k}$  and  $3\hat{i} - 4\hat{j} - \hat{k}$  is
- (a)  $\frac{\hat{i}}{\sqrt{3}} + \frac{\hat{j}}{\sqrt{3}} - \frac{\hat{k}}{\sqrt{3}}$   
(b)  $\frac{\hat{i}}{\sqrt{2}} + \frac{\hat{j}}{\sqrt{2}} + \frac{\hat{k}}{\sqrt{2}}$   
(c)  $\frac{\hat{i}}{\sqrt{3}} - \frac{\hat{j}}{\sqrt{3}} - \frac{\hat{k}}{\sqrt{3}}$   
(d)  $\frac{\hat{i}}{\sqrt{3}} + \frac{\hat{j}}{\sqrt{3}} + \frac{\hat{k}}{\sqrt{3}}$

29. For any Vector  $\vec{a}$   $|\vec{a} \times \hat{i}|^2 + |\vec{a} \times \hat{j}|^2 + |\vec{a} \times \hat{k}|^2$  is equal to  
 (a)  $|\vec{a}|^2$  (b)  $2|\vec{a}|^2$   
 (c)  $3|\vec{a}|^2$  (d)  $4|\vec{a}|^2$
30. If  $|\vec{a}| = 2$ ,  $|\vec{b}| = 5$  and  $|\vec{a} \times \vec{b}| = 8$  then what is  $\vec{a} \cdot \vec{b}$  equal to.  
 (a) 6 (b) 7  
 (c) 8 (d) 9
31. Arithmetic mean of 10 Observations is 60 and sum of squares of deviations from 50 is 5000. What is the standard deviation of the observations.  
 (a) 20 (b) 21  
 (c) 22.36 (d) 24.70
32. In an examination 40% of Candidates got second Class. When the data are represented by pie chart what is the angle Corresponding the second Class.  
 (a)  $40^\circ$  (b)  $90^\circ$   
 (c)  $144^\circ$  (d)  $320^\circ$
33. If a fair die is rolled 4 times then what is the probability that, have are exactly 2 sixes.  
 (a)  $\frac{5}{216}$  (b)  $\frac{25}{216}$   
 (c)  $\frac{125}{216}$  (d)  $\frac{175}{216}$
34. Two Cards are chosen at random from a deck of 52 cards. What is the probability that both of them have the same value?  
 (a)  $\frac{1}{17}$  (b)  $\frac{3}{17}$   
 (c)  $\frac{5}{17}$  (d)  $\frac{7}{17}$
35. For two events A and B let  $P(A) = \frac{1}{2}$ ,  $P(A \cup B) = \frac{2}{3}$  and  $P(A \cap B) = \frac{1}{6}$ . What is  $P(\bar{A} \cap B)$  equal to?  
 (a)  $\frac{1}{6}$  (b)  $\frac{1}{4}$   
 (c)  $\frac{1}{3}$  (d)  $\frac{1}{2}$
36. What is the number of triangles that can be formed by choosing that vertices from a set of 12 points in a plane seven of which lie on the same staright line?  
 (a) 185 (b) 175  
 (c) 115 (d) 105
37. What is the value of  $\log_9 27 + \log_8 32$   
 (a)  $\frac{7}{2}$  (b)  $\frac{19}{6}$   
 (c) 4 (d) 7
38. If the line  $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$  lies on the plane  $2x - 4y + z = 7$  then what is the value of k.  
 (a) 2 (b) 3  
 (c) 5 (d) 7
39. The binary number expression of the decimal number 31 is.  
 (a) 1111 (b) 10111  
 (c) 11011 (d) 11111
40. The number of real roots of the equation  $x^2 - 3|x| + 2 = 0$  is  
 (a) 2 (b) 4  
 (c) 1 (d) 3
- **Direction:-** Read each of the following passage carefully and answer the questions that follow.
- He saw nothing he had know knife or sharp instrument, the grating of the window was iron and he had too often assured himself of its solidity. His furniture consisted of a bed, a chair, a table, a pail and a jug. The bed had iron clamps, but they were screwed to the wall and it would have required a screwdriver to take them off.
- Dantes had but one resource which was to break the jug and with one of the sharp fragments attack the wall. He let the jug fall on the floor and it broke in pieces. He concealed two or three of the sharpest fragments in his bed, leaving the rest on the floor. The breaking of the jug was too natural an accident to excite suspicion, and next morning the gaolre went grumblingly to fetch another without giving himself the trouble to remove the fragments. Dantes heard joyfully the key grate in the lock as the guard departed.
41. Dantes was in  
 (a) a hostel  
 (b) a dining room  
 (c) an army barracks  
 (d) a prison
42. Dantes was planning to  
 (a) carve his name (b) make his escape  
 (c) tease the guard (d) call for breakfast
43. The guard left the fragments because he

- (a) didn't notice them
- (b) wished to punish
- (c) was too lazy to bother
- (d) wanted Dantes to clear up

➤ **Direction:-** Out of the given alternatives, choose the one that best expresses the meaning of the given word.

**44. DODGE**

- (a) Confuse (b) Avoid
- (c) Thwart (d) Frustrate

**45. INSIPID**

- (a) Dull (b) Disobedient
- (c) Insane (d) Incapable

**46. BUCOLIC**

- (a) Helpless (b) Fancy
- (c) Shameless (d) Rustic

➤ **Direction:** In each of the following questions, choose the word opposite in meaning to the given word.

**47. QUERULOUS**

- (a) Bright (b) Splendid
- (c) Smart (d) Happy

**48. PERNICIOUS**

- (a) Precious (b) Healing
- (c) Swerving (d) Conservative

**49. EXPLICATE**

- (a) Enjoy (b) Rinse
- (c) Clarify (d) Accept

➤ **Directions:-** In the following sentences certain words are jumbled up so that the sentence has lost its proper meaning. For your convenience each sentence is broken into various parts and each part is marked P,Q,R,S. There are four alternatives that follow the question line. You have to find out the correct alternatives the order of which will provide proper meaning to the sentence.

**50.** S1: We are living in a n age in which technology has suddenly "annihilated distance".

P: Are we going to let this consciousness of our variety make us fear and hate each other?

Q: Physically we are now all neighbours, but psychologically we are still strangers to each other.

R: How are we going to react?

S: We have never been so concious of our variety as we are now that we have come to such close quarters.

S6: In that event, we should be dooming or selves to wipe each other out.

- (a) PQSR (b) PSQR
- (c) QSRP (d) RQSP

**51.** S1: In 1945, America faced to powerful enemies in the world war.

S6: This was the weapon that ended the second world war.

P: America found conventional weapons insufficient to crush them.

Q: These were Germany and Japan who posed strong opposition to America.

R: The result of this was the production of the Atom bomb.

S: The government ordered scientists to conduct research and produce a new , deadly weapon.

The proper sequence should be:

- (a) QPSR (b) PQRS
- (c) QPRS (d) PQSR

**52.** S1: One of the most dangerous insect pests is the locust.

S6: At this stage, they gather in huge numbers and rise from the ground on their powerful wings in cloud.

P: At first they look just like ordinary grasshoppers, which are harmless and unable to fly very far.

Q: Until about thirty year ago, no one knew where locusts came from or why they appeared in the different countries they attacked.

R: Then they change in appearance and develop wings which enable them to fly long distances.

S: Then it was discovered that there are two stages in the life of locusts.

- (a) PSQR (b) PSRQ
- (c) QSPR (d) QSRP

➤ **Direction:-** Four parts of each of the following sentences are given. One of these parts has a mistake somewhere. You have to marks only that part which has a mistake. Mind you, you have only to identify the incorrect portion of the sentences and not to correct it. In case of the sentences having three parts a, b & c No error will form part (d).

53. Myself Avika (a)/ I work with (b)/ an MNC(c)/ No error(d)
54. Avni told to the teacher (a)/ that she couldn't come for the rehearsals (b)/ the next day. (c)/ No error(d)
55. Meghna went to her friend's house at the appointed hour but(a)/ she was told (b)/ that her friend left half an hour earlier.(c)/ No error(d)
56. Pihu is (a)/ enough old (b)/ to get married.(c)/ No error(d)
57. I am told that Ananya has been (a)/ suffering from fever (b)/ since ten days. (c)/ No error(d)

➔ **Direction :** Given below are some idioms/phrases followed by four alternatives meanings to each. Select the most appropriate response from the options (a), (b), (c) or (d) and mark your response on the Answersheet accordingly.

58. 'A white elephant'  
(a) A useless item/person  
(b) An expensive  
(c) A big one  
(d) A small one
59. 'Bells and Whistles'  
(a) Unnecessary extras  
(b) Bells for alarming  
(c) Whistles for signalling  
(d) Cheerful and joyful
60. 'Nip in the bud'  
(a) Punish the opposition  
(b) Hide a secret  
(c) Suppress something at an early stage  
(d) Fight with someone younger
61. In Bangladesh Ganga is called  
(a) Debang (b) Meghna  
(c) Lohit (d) Padma
62. Match List-I and List-II

List-I Project		List-II River	
A.	Bhakra	1.	Krishna
B.	Hirakund	2.	Periyar
C.	Idukki	3.	Mahanadi
D.	Nagarjun Sagar	4.	Satluj

Coot

A	B	C	D
(a) 1	2	3	4
(b) 4	3	2	1
(c) 3	4	1	2
(d) 4	1	3	2

63. India's largest rubber producer  
(a) Karnatka (b) Maharastra  
(c) Kerela (d) Gujarat
64. Consider the following statement  
1. The sun light reaches Earth in 8 min 20 sec.  
2. Indian became 2nd country reached on the south pole of the moon.  
Which of the following is/are correct answer:  
(a) only 1  
(b) only 2  
(c) both 1 and 2  
(d) Neither 1 nor 2
65. Which of the following is an example of fold mountain?  
(a) Siera Nevada (b) Alps  
(c) Satpura (d) Sinsinati
66. Which wind does Blood Rain?  
(a) Simum (b) Chinook  
(c) Sirocco (d) Fohn
67. The greater Himalaya is separated from the lesser Himalaya by—  
(a) Indo-Tsangpo Shuture zone  
(b) Main central thrust  
(c) Main boundary fault  
(d) Great boundary fault
68. India's longest National water ways—  
(a) From Prayagraj to Haldia  
(b) From Sadia to Dhubri  
(c) From Kottapuram to Kollam  
(d) From Bhadrachalam to Rajmundri
69. Which of the following state was known as NEFA?  
(a) Assam  
(b) Arunachal Pradesh  
(c) Meghalaya  
(d) Tripura
70. Consider the following statement  
1. In the world, father of green revolution known as Norman Earnest Borlough  
2. In India Dr. M.S.S Swaminathan known as father of green revolution



- (a) Only 1                      (b) Only 2  
(c) 1 and 2 both              (d) Neither 1 nor 2
- 71.** Consider the following statements about Motion.
1. Motion is observed when its position changes with time.
  2. If an object moves very slowly then its movement can be observed easily.
  3. Rectilinear motion takes place in a fixed direction.
- Which of the above statements is/are correct?
- (a) 1 and 3                      (b) 2 and 3  
(c) 1 and 3                      (d) 1, 2 and 3
- 72.** The unit of force
- (a) Newton                      (b) Dyne  
(c) Kilogram                      (d) Candela
- 73.** One kilowatt hour is equal to
- (a) 3.6 mega joule              (b) 3.2 mega joule  
(c) 4.0 mega joule              (d) 3.8 mega joule
- 74.** Heat from the sun reached earth by—
- (a) Convection                      (b) Radiation  
(c) Conduction                      (d) Reflection
- 75.** The hair of shaving brush clings together when removed from water due to
- (a) Friction                      (b) Elasticity  
(c) Surface tension              (d) Viscosity
- 76.** The best conductor of electricity among the following is
- (a) copper                      (b) Silver  
(c) Iron                      (d) Aluminium
- 77.** Shaving mirror is—
- (a) Plane                      (b) Parabolic  
(c) Convex                      (d) Concave
- 78.** If  $X$  goes towards North Pole from Equator, the effect on 'g'
- (a) increases                      (b) decreases  
(c) remain same                      (d) None of the above
- 79.** Ohm's law is valid in case of the following?
- (a) Conductor  
(b) Semi conductor  
(c) Super conductor  
(d) Insulator
- 80.** Optical fibers are based on phenomenon of
- (a) Total internal reflection  
(b) Diffraction  
(c) Dispersion  
(d) Interference
- 81.** Where did battle of Plassey fight?
- (a) Bihar                      (b) Bengal  
(c) Oudh                      (d) Maharashtra
- 82.** Who implemented Permanent settlement?
- (a) Lord Cornwallis  
(b) Wellesly  
(c) Lord William Bentick  
(d) Lord Dalhousie
- 83.** Where is tomb of Akbar?
- (a) Sikandara                      (b) Agra  
(c) Delhi                      (d) Farukhabad
- 84.** What is the chemical name for 'Baking Soda'?
- (a) Sodium Carbonate  
(b) Sodium bicarbonate  
(c) Sodium Nitrite  
(d) Sodium Nitrate
- 85.** The major component in the LPG is—
- (a) Methane                      (b) Butane  
(c) Ethane                      (d) Propane
- 86.** The pH of lemon juice is expected to be—
- (a) equal to 7                      (b) less than 7  
(c) more than 7                      (d) less than 6
- 87.** Pituitary gland is located in—
- (a) brain                      (b) liver  
(c) kidney                      (d) intestine
- 88.** The enzyme that is present in the saliva of man is
- (a) Pepsin                      (b) Renin  
(c) Amylase                      (d) Trypsin
- 89.** Polio is caused by
- (a) Bacteria                      (b) Insect  
(c) Fungus                      (d) Virus
- 90.** Where is Narendra Modi cricket stadium?
- (a) Ahmedabad                      (b) Gandhi Nagar  
(c) Rajkot                      (d) Surat
- 91.** How many parts are in the constitution?
- (a) 22                      (b) 24  
(c) 21                      (d) 25
- 92.** Select the mismatch pair of the following?
- (a) Australian open  
(b) French open  
(c) Wimbledon  
(d) Davis cup
- 93.** Who is author of why Bharat Matters?
- (a) Ajit Dobal                      (b) S. Jaishankar  
(c) Prasun Joshi                      (d) Smriti Irani

94. In which house the budget is presented?  
(a) Loksabha  
(b) Rajya-Sabha  
(c) Legislative Council  
(d) both a and b
95. For which Loksabha the election of 2024 took place?  
(a) 17 (b) 18  
(c) 19 (d) 16
96. Indian Economy is—  
(a) Mixed economy  
(b) Capitalistic economy  
(c) Traditional economy  
(d) Market economy
97. Who won 2024 Australia open?  
(a) Andy Murray  
(b) Novac Jocoviz  
(c) Janik Sinner  
(d) Rohan Boponna
98. Where is the head quarters of the ISRO?  
(a) New Delhi (b) Bangluru  
(c) Hyderabad (d) Ranchi
99. Who was the Prime Minister of India during the establishment of National Defence Academy?  
(a) Indira Gandhi  
(b) Lal Bahadur Shastri  
(c) Jawahar Lal Nehru  
(d) Establishment before independence
100. The commodore of Indian Navy is equal to which of the following rank of Indian army?  
(a) Colonel (b) Brigadier  
(c) Major General (d) Captain