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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 $z = (aw^2 + bw^c)$ 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 α and β 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 $[xyz]$ $\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} [x \\ y \\ z]$

(a) 3×1 (b) 1×1 (c) 1×3 (d) 3×3

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 α is equal to.

(a) ± 1 (b) ± 2 (c) ± 3 (d) ± 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 $x = \pi$ equal to?

(a) $(1 + \pi)e^{\pi^2}$ (b) $2e^{\pi^2}$
 (c) $2\pi e^{\pi^2}$ (d) e^{π^2}

22. If $x = a(\cos \theta + \theta \sin \theta)$ and $y = a(\sin \theta - \theta \cos \theta)$ what is $\frac{d^2y}{dx^2}$ equal to

(a) $\sec^2 \theta$ (b) $-\csc^2 \theta$
 (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) $\frac{1}{3}$ unit² (b) 1 unit²
 (c) 2 unit² (d) $\frac{1}{6}$ unit²

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) $\frac{\hat{i}}{\sqrt{2}} + \frac{\hat{i}}{\sqrt{2}} + \frac{\hat{k}}{\sqrt{2}}$
 (c) $\frac{\hat{i}}{\sqrt{3}} - \frac{\hat{i}}{\sqrt{3}} - \frac{\hat{k}}{\sqrt{3}}$
 (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° (b) 90°
 (c) 144° (d) 320°

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 grumbly 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.	Bakra	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 Ernest Borlough
 2. In India Dr. M.S.S. Swaminathan known as father of green revolution

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) Wellesley
(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) Tripsin

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

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