



ADAT - 2017

(Aditya Degree Admission Test, a compulsory exam for admission into 3 years degree course)

ADITYA DEGREE COLLEGES



KAKINADA :: RAJAHMUNDRY :: VISAKHAPATNAM :: PALAKOL

Time : 3hrs

Max Marks :100

- Instructions:** 1. There will be 5 Sections- Mathematics, Physics, Chemistry, Aptitude & Softskills.
2. Each section consists of 20 bits & each bit carries 1 Mark.
3. Each wrong answer entails 1/4 negative marking.

SECTION -A (MATHEMATICS)

1. $f(x+y) = f(x) \cdot f(y)$ for all x and y . $f(1) = 2$ the area enclosed by $3|x| + 2|y| \leq 8$ is
1. $f(5)$ sq.units 2. $f(6)$ sq.units 3. $\frac{1}{3} f(6)$ sq.units 4. $f(4)$ sq.units
2. If p is the length of the perpendicular from the origin on the line $\frac{x}{a} + \frac{y}{b} = 1$ and a^2, p^2, b^2 are in A.P. Then $a^4 - 2p^2$
 $a^2 + 2p^4 =$ _____
1. -1 2. 0 3. 1 4. 2
3. If θ is angle between diagonal of a cube and diagonal of a face of a cube then $\cos^2 \theta =$
1. $\frac{1}{2}$ 2. 0 3. $\frac{1}{3}$ 4. $\frac{2}{3}$
4. $\lim_{x \rightarrow 0}$
1. $\frac{3}{32}$ 2. $\frac{9}{32}$ 3. $\frac{3}{2}$ 4. $\frac{7}{32}$
5. If $y = \frac{1}{x} - \frac{1}{x^2} + \frac{1}{x^3} - \frac{1}{x^4} + \dots (x > 1)$ Then $\frac{dy}{dx} =$
1. $\frac{1}{1+x}$ 2. $\frac{-1}{1+x^2}$ 3. $\frac{-1}{(1+x)^2}$ 4. $1 - \frac{1}{2x} + \frac{1}{3x^2} + \dots$
6. Equation of the rectangular hyperbola whose asymptotes are coordinate axes is
1. $x^2 - y^2 = a^2$ 2. $x^{2/3} - y^{2/3} = a^{2/3}$ 3. $xy = c^2$ 4. $y^2 = ax^2$
7. $\int_0^{2\pi} [|\sin x| + |\cos x|] dx =$
1. 0 2. 4 3. 8 4. 1
8. The focus of the parabola $y^2 - x - 2y + 2 = 0$
1. $\left(\frac{1}{4}, 1\right)$ 2. $\left(\frac{5}{4}, 1\right)$ 3. $\left(1, \frac{5}{4}\right)$ 4. $\left(\frac{5}{4}, 0\right)$
9. Distance between directrices of the ellipse $\frac{x^2}{36} + \frac{y^2}{20} = 1$ is
1. 28 2. 18 3. 56 4. 16
10. The centre of the circle which cuts orthogonally each of the three circles
 $x^2 + y^2 + 2x + 17y + 4 = 0$, $x^2 + y^2 + 7x + 6y + 11 = 0$ and $x^2 + y^2 - x + 22y + 3 = 0$ is
1. (3,2) 2. (1,2) 3. (2,3) 4. (0,2)



11. If a and b are unit vectors and θ is the angle between them, then $a - b$ will be a unit vector if $\theta =$
1. $\frac{\pi}{4}$ 2. $\pi/3$ 3. $\pi/6$ 4. $\pi/2$
12. Period of the function $|\sin x| + |\cos x|$
1. $\frac{\pi}{2}$ 2. π 3. 2π 4. $\frac{3\pi}{2}$
13. The value of $\sin 21^\circ \cos 9^\circ - \cos 84^\circ \cos 6^\circ$ is
1. $\frac{1}{2}$ 2. 0 3. 1 4. $\frac{1}{4}$
14. Value of $\sin^{-1} \frac{4}{5} + 2 \tan^{-1} \frac{1}{3} =$
1. $\pi/3$ 2. π 3. $\frac{\pi}{2}$ 4. 2π
15. If $a = 4, b = 5, c = 7$ then $\cos \frac{B}{2} =$
1. $\frac{6}{7}$ 2. $\sqrt{\frac{6}{7}}$ 3. $\sqrt{\frac{7}{6}}$ 4. $\frac{7}{6}$
16. The sum of the First 10 Terms in the expansion $(1-x)^{-3}$ is
1. 220 2. 286 3. 120 4. 150
17. $\sqrt{42 + \sqrt{42 + \sqrt{42 + \dots}}} =$
1. -6 2. 5 3. $\sqrt{43}$ 4. 7
18. The number of different signals can be given by using only numbers of flags from 4 flags of different colours is
1. 24 2. 256 3. 64 4. 60
19. The probability that leap year will have 53 sundays is
1. $\frac{1}{7}$ 2. $\frac{2}{7}$ 3. $\frac{3}{7}$ 4. $\frac{4}{7}$
20. If α is root of $f(x) = 0$ then α^2 is root of
1. $f(x) = 0$ 2. $f(x+1) = 0$ 3. $f(\sqrt{x}) = 0$ 4. $f(x^2) = 0$

SECTION - B (PHYSICS)

21. If force, velocity and time are taken as fundamental quantities then the dimensions of work is
1. FVT 2. $\frac{FV}{T}$ 3. $\frac{VT}{F}$ 4. $\frac{FT}{V}$
22. If $A = 2i + 4j + 4k$ and $B = 4i + 2j - 4k$ are two vectors, then the angle between them is
1. 0° 2. 45° 3. 90° 4. 60°
23. A 2 kg block is moving on a straight line with a constant velocity of 4m/s for 4sec. The resultant force in newtons is
1. 2 2. 0 3. 32 4. 8
24. A Spring balance is placed on a horizontal table. Its two ends are pulled with a force of 10kg wt each. The reading of the balance in kg wt is
1. 0 2. 20 3. 10 4. 5
25. A hole is dug along the diameter of the earth from north to south and a body is dropped into it. then it
1. Comes out from the other end 2. Stops at the centre
3. Executes S.H.M 4. Remains at the point from where it is dropped.



26. A given quantity of gas ($\gamma=1.5$) at 27°C is compressed suddenly to one fourth of its volume. The change in temp is
1. 300k 2. 300°C 3. both a & b 4. 0
27. Three tuning forks produce sounds of wavelengths 1m , 2m and 3m respy in air at the same temp. The ratio of their frequencies is
1. $2 : 3 : 6$ 2. $6 : 3 : 2$ 3. $6 : 2 : 3$ 4. $3 : 6 : 2$
28. Longitudinal waves can be produced in
1. Solids 2. Solids & Liquids
3. Liquids & Gases 4. Solids, Liquids & Gases
29. A Convexo Concave lens has radii 16cm and 24cm . If its refractive index is 1.5 , the focal length is
1. 96cm 2. 19.2cm 3. 64cm 4. 36cm
30. Two raindrops hit the ground with speeds 120ms^{-1} and 30ms^{-1} the ratio of their diameters is
1. $4 : 1$ 2. $2 : 1$ 3. $1 : 2$ 4. $8 : 1$
31. An electron and proton are subjected to same electric feild. The ratio of the forces acting on them is
1. $1 : 2$ 2. $2 : 1$ 3. $1 : 1$ 4. $1 : 4$
32. The effective resistances of two resistances are 9ohms and 2ohms when they are connected in series and in parallel respy. The individual resistances are
1. 1 and 2 2. 2 and 3 3. 3 and 4 4. 6 and 3
33. An inductance 1 Henry is connected in series with A.C source of 220V and 50Hz . The inductive reactance in ohms is
1. 2π 2. 50π 3. 100π 4. 1000π
34. A current carrying circular coil, suspended freely in a uniform external magnetic feild orients to a position of stable equilibrium. In this state
1. The plane of the coil is normal to the external magfield.
2. The plane of the coil is parallel to the external magfield
3. Flux through the coil is minimum
4. Torque on the coil is maximim
35. The ratio of radii of nuclei ${}_{13}\text{Al}^{27}$ and ${}_{52}\text{Te}^{125}$ is
1. $1 : 5$ 2. $2 : 5$ 3. $4 : 5$ 4. $3 : 5$
36. In a nuclear reactor using ${}_{92}\text{U}^{235}$ as a fuel the out put power is 4.8mw . Energy released per fission $=20\text{mev}$. The number of fissions per sec is
1. 15×10^{17} 2. 3×10^{19} 3. 3×10^{25} 4. 3×10^{25}
37. In n- type semi conductor, The fermi energy level is
1. In the forbidden energy gap nearer to the conduction band
2. In the Forbidden energy gap nearest to the Valince band
3. In the middle of forbidden energy gap
4. Outside the forbidden energy gap
38. In a transistor circuit, when the base current is increased by 56 microamp at fixed collector voltage 2volt , the collector current increases by 1m amp . The current gain of the transistor is
1. 20 2. 40 3. 60 4. 80
39. Two magnets of moments 20 and 15amp m^2 are placed perpendicular to each other. The resultant magnetic moment in amp m^2 is
1. 35 2. 5 3. 625 4. 25
40. The property of light that confirmed the transverse nature of light is
1. reflection 2. refractions 3. interference 4. polarisation

SECTION - C (CHEMISTRY)

41. Electron is discovered by
1. Rutherford 2. J.J.Thomson 3. James Chadwick 4. Stoney
42. According to Molecular Orbital Theory, O_2 is paramagnetic because of presence of
1. Two unpaired electrons 2. Three unpaired electrons
3. One unpaired electron 4. zero unpaired electron
43. Which of the following is called inorganic benzene
1. Borazole 2. chlorobenzene 3. boracyclohexane 4. cyclohexane
44. The value of Plank's constant is
1. $6.625 \times 10^{-27}\text{ erg sec}$ 2. $66.25 \times 10^{-26}\text{ erg sec}$
3. $662.5 \times 10^{-27}\text{ erg sec}$ 4. $6.625 \times 10^{-34}\text{ erg sec}$



45. In the titration of KMnO_4 and Mohr's salt, the indicator used is
1. methyl orange 2. phenolphthalein 3. diphenylamine 4. self indicator
46. $PV=nRT$ is
1. Charles Law 2. Ideal gas equation 3. Boyle's Law 4. Avagadro's Law
47. Propene on addition of HBr gives
1. Propane 2. 2-Bromo Propane 3. 1-Bromo Propane 4. propanol
48. Hybridisation of carbon in methyl carbanion is
1. SP^3 2. SP^3d^2 3. SP^2 4. SP^3d
49. The oxidation number of oxygen in peroxides and superoxides respectively are
1. +1, -1/2 2. +1, +1/2 3. -1, -1/2 4. -1, +1/2
50. E° of hydrogen electrode is
1. 1 2. -1 3. +1 4. 0
51. Which element is stored in water
1. P 2. Al 3. C 4. N
52. H_2SO_4 is called
1. Oil of Vitriol 2. Musturd Oil 3. Oil of winter green 4. Oil of Mirbane
53. In an electrolytic cell current flows from
1. cathode to anode 2. anode to cathode 3. does not flow 4. none
54. Example of electron deficient compound
1. methane 2. acetic acid 3. diborane 4. sulphuric acid.
55. Laughing gas is
1. NO_2 2. N_2O_3 3. N_2O 4. N_2O_5
56. Which of the following give methane on hydrolysis
1. CaC_2 2. Al_4C_3 3. BN 4. all
57. Proton is identical with
1. H 2. H^- 3. H^+ 4. He
58. Benzene diazonium chloride react with CuCN and produce
1. Phenol 2. Phenyl cyanide 3. Benzene 4. Phenyl Isocyanide
59. Baeyer's reagent is
1. Aq. Br_2 solution 2. acidic KMnO_4 3. alkaline KMnO_4 4. neutral KMnO_4
60. The general electronic configuration of P - block elements
1. $n\text{S}^2n\text{P}^1$ 2. $n\text{S}^2n\text{P}^2$ 3. $n\text{S}^2n\text{P}^{1-5}$ 4. $n\text{S}^2n\text{P}^{1-6}$

SECTION - D (APTITUDE)

61. In a code FLAUNT is written as DNYWLV, then how will WAGONG be written
1. UYEMLQ 2. YCLQPU 3. CYEPQU 4. UCEQLI
62. BDFH : JNLP :: CEGI :-
1. HIJK 2. EGJL 3. KMOQ 4. KLPQ
63. Which one does not belong to the same group
1. Tomato 2. Turmeric 3. Potato 4. Carrot
64. Which one does not belong to the same group
1. 31 2. 41 3. 81 4. 71
65. Complete the series DF,GJ,KM,NQ,RT, _____
1. UW 2. UX 3. YZ 4. XZ
66. A is the brother of B. C is the mother of B. M is the sister of C. How is M related to B.
1. Nephew 2. Niece 3. Uncle 4. Aunt
67. If P means X, R means \div , M means -, and W means + then find the value of $20R 5 W12 M3 P4$
1. 4 2. 16 3. 28 4. 52
68. Amar walked 30 meters toward south, turned left and walked 50 meters, again he turned left and walked 30 meters. How far is he from the starting point.
1. 80 meters 2. 100 meters 3. 50 meters 4. 130meters



69. Which of the following does not belong to the same group
1. Blue 2. Red 3. Violet 4. Grey
70. BELOW is related to OBWEL in the same way as DRAFT is related to _____
1. ARTDF 2. FDART 3. DFTRA 4. FDTRA
71. A car covers a distance of 576 kms in 12 hours what is the speed of the car.
1. 54kmph 2. 62 kmph 3.46 kmph 4. 46 kmph
72. There are 1825 employees in an organization out of which 64% are transferred to different places. How many employees are transferred
1. 1054 2. 1168 3. 1490 4. 1263
73. Find the average of 354,281,623,518
1. 444 2. 454 3. 446 4. 464
74. A canteen requires 28 kgs of sugar for one week. How many kgs of sugar is required for the months of March and April.
1.248kgs 2. 274 kgs 3. 244 kgs 4. 232 kgs
75. In an examination Jyothi scored a total of 520 marks out of 800. What is the percentage she got
1. 55 2. 65 3.75 4. 69
76. 15 men can complete a work in 4 days. In how many days will 20 women complete the same work.
1. 2 2. 4 3. 5 4. 3
77. 46% of a member is 1426. What is the number
1. 3100 2. 2550 3. 3475 4.4200
78. A shop keeper buys 5 bangles for Rs. 8880 and later sell them for Rs 9875. How much profit he makes for one bangle.
1. Rs 205 2. Rs 199 3. Rs 213 4. Rs 191
79. What least number is to be added to 8888 to make it a perfect square.
1. 137 2. 52 3. 112 4. 90
80. The average of 4 consecutive even numbers A,B,C and D is 45. What is the product of A and C.
1. 2025 2. 1848 3. 1932 4. 2016

SECTION - E (SOFT SKILLS)

Directions: Read the following passage carefully, identify the correct answer to each of the following questions and mark the corresponding letter as your answer.

Crude mineral oil comes out of the earth as a thick brown or black liquid with a strong smell. It is a complex mixture of many different substances, each with its own individual qualities. Most of them are combinations of hydrogen and carbon in varying proportions. Such hydrocarbons are also found in other forms such as bitumen, asphalt and natural gas. Mineral oil originates from the carcasses of tiny animals and from plants that live in the sea. Over millions of years, these dead creatures form large deposits under sea-bed and ocean currents cover them with a blanket of sand and slit. As this material hardens, it becomes sedimentary rock and effectively shuts out the oxygen, so preventing the complete decomposition of the marine deposits underneath. The layers of sedimentary rock become thicker and heavier. Their pressure produces heat, which transforms the tiny carcasses into crude oil in a process that is still going today.

81. Marine deposits under the sea do not get decomposed because they:
1. Become rock and prevent oxygen from entering them
2. Are covered by the sand and slit brought by the current
3. Contain a mixture of hydrogen and carbon
4. Are constantly washed by the ocean current
82. Sedimentary rock leads to the formation of oil deposits because :
1. It becomes hard and forms into rocks which produce oil.
2. Its pressure produces heat and turns the deposits of animal carcasses and plants into oil
3. It turns heavy and shuts out the oxygen
4. It becomes heavy and hard, and applies pressure to squeeze oil
83. In order to heavy mineral oil, hydrogen and carbon are combined in:
1. Equal proportions 2. Fixed proportions 3. Varying proportions 4. The proportion of two and one



84. The time it takes for the marine deposits to harden into rock is :
1. A few years 2. Thousands of years 3. Hundreds of years 4. Millions of years

FILL IN THE BLANKS

Directions: choose the appropriate word to fill in each of the following blanks and mark the corresponding letter as your answer.

Articles:

85. He went to.....college to meet.....class teacher.
1. a,an 2. an, the 3. the, the 4. a & no article
86.European woman came to America.
1. a 2. an 3. the 4. no article

Prepositions:

87. In General, acids act Metals
1. on 2. in 3. by 4. with
88. He fell the tree an axe
1. On 2. in 3. by 4. with

Conjunctions:

89. A student will fail he does not work hard
1. Because 2. if 3. until 4. though
90. He was late It was raining heavily
1. While 2. after 3. when 4. because

Tenses:

91. He always To prove that the earth revolves round the sun
1. Tried 2. Tries 3. was trying 4. is trying
92. I was watching TV when she In
1. Comes 2. Came 3. come 4. was coming

Correction of sentences

Directions: Identify the part containing the error in each of the following sentences and mark the corresponding letter as your answer.

93. Her and the (1) other members of the group (2) spoke to the person (3) after their final victory (D)
94. When she comes (1) to see us (2) she usually will bring (3) something with her (4)
95. . I did not want (1) him to have spent (2) all the money at (3) the fair yesterday
96. . He picked up (1) the books (2) and put it (3) on the table (4)

Vocabulary:

Directions:

Choose the correct synonym to each of the following words. and the mark the corresponding letter as your answer.

97. absurd
1. Ridiculous 2. correct 3. clear 4. wise
98. Bewilde
1. happier 2. Perplex 3. rational 4. gently

Directions:

Choose the correct Antonym to each of the following words and the mark the corresponding letter as your answer.

99. Renounce
1. Denounce 2. Allow 3. Follow 4. Permit
100. Boon
1. Bless 2. Bane 3. Gift 4. Accept

* * * * *

