

# AP GRAMA/WARD SACHIVALAYAM GRAND TEST – 2

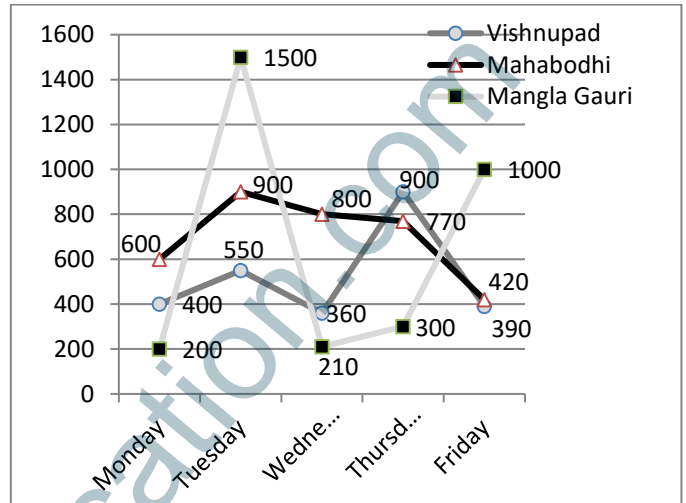
## CAT - 2A

MARKS : 150    No. of Questions: 150    Time : 150 Minutes    (-)tive marks: 0.25

- Ramesh Yadav can do  $\frac{1}{3}$ rd of the work in 4 days Jitu  $66\frac{2}{3}\%$  of the work in 6 days and Pawan  $\frac{2}{5}$ th of the work in 10 days. First day Ramesh Yadav, second day Jitu and third day Pawan do the work. Again fourth day Ramesh Yadav and in the same manner Jitu and Pawan do the work. Then find in how many days will the work complete?
  - $12\frac{56}{75}$ days
  - $18\frac{56}{75}$  days
  - $10\frac{56}{75}$ days
  - None of these
- The price of certain items is increased by 15%. If a consumer wants to keep this expenditure on the item the same as before, how much percent must he reduce his consumption of that item.
  - $13\frac{1}{23}\%$
  - $13\frac{1}{25}\%$
  - $14\frac{1}{23}\%$
  - 15%
- Two trains A and B, start from stations X and Y towards each other they take 4 hours 48 minutes and 3 hours 20 minutes to reach Y and X respectively after they meet if train A is moving at 45 km/hr, then the speed of the train B is:
  - 60 km/hr
  - 64.8 km/hr
  - 54 km/hr
  - 37.5 km/hr
- A sum of money placed at compound interest thrice itself in 4 years. In how many years will it amount to 27 times itself?
  - 12 years
  - 15 years
  - 14 years
  - 10 years
- A and B started a business in partnership by investing in the ratio of 7 : 9. After 3 months A withdraw  $\frac{2}{3}$  of its investment and after 4 months from the beginning B withdraw  $33\frac{1}{3}\%$  of its investment. If a total earned profit is Rs. 10201 at the end of 9 months, find the share of each in profit
  - Rs. 3535, Rs. 6666
  - Rs. 3055, Rs. 5555
  - Rs. 4503, Rs. 1345
  - Rs. 3545, Rs. 3333

**Directions (6-8):** Study the following graphs carefully to answer the questions that follow.

**No. of visitors on specific days**



- What is the average number of visitors who visited Mahabodhi Mandir on all the days together?
  - 692
  - 444
  - 450
  - 698
- Total number of visitors who visited all the three places on Tuesday together is what per cent of the total number of visitors who visited Vishnupad on Thursday and Tuesday together?
  - 49.15%
  - 203.45%
  - 15.59%
  - 641.38%
- On which day was the total number of visitors who visited by all the three places together is second lowest?
  - Monday
  - Wednesday
  - Thursday
  - Friday
- I hire a taxi from my home to go to my workplace. The fare system in the city is such that for the first kilometer, I am charged Rs 25, and after that, I am charged Rs 6 per kilometer. If my workplace is 10 km far from my home, what amount do I have to pay if I go by taxi?
  - Rs. 64
  - Rs. 89
  - Rs. 90
  - Rs. 79
- Select the missing number from the given responses:

18	90	5
13	143	11
7	?	5

- 12
  - 2
  - 53
  - 35
- In the following questions a fact or situation is given followed by two suggested courses. A course of action is a step of administrative decision taken for improvement or follow-up action. Read the situation and then decide which of the given courses of action follows.
 

**Statement:** Youngsters are often found staring at obscene posters.

**Courses of Action:**

I) Children should be punished and penalised if they are found doing so.

II) Any display of such materials should be banned.

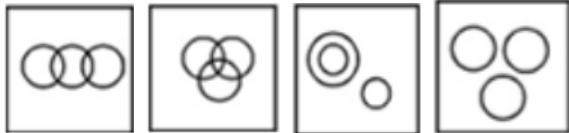
- (a) if only course of action I follows  
 (b) if only course of action II follows  
 (c) if both the course of action follow  
 (d) if neither follows

12. Anand is son of Prema. Rajeev is brother of Prema. Neha is daughter of Rashmi. Neha is sister of Rajeev. How is Anand related to Rashmi?

- (a) Son (b) Grandson  
 (c) Grandfather (d) Granddaughter

13. Identify the diagram that best represents the relationship among the given classes.

Singer, Musician, Businessman.



- (a) (b) (c) (d)

**Direction (Q. No. 14) :** In the following question a blank has been given in a sentence and it is followed by four options namely a, b, c and d. One of the options fills up the blank. Choose the appropriate option.

14. We go for a walk \_\_\_\_\_ the morning  
 (a) for (b) in (c) off (d) on

15. Out of the four alternatives, choose the one which best expresses the meaning of the given word in bold letters.

Acme

- (a) Pinnacle (b) Aural  
 (c) Twang (d) Salvation

**Direction (Q. No. 16) :** In the following a paragraph has been jumbled. After keeping it in order attempt the appropriate option that makes sense and keep the paragraph in a proper order.

16. (A) However, marketing reports are not good.  
 (B) It is one of its kind in India  
 (C) The company now, may bring down the price  
 (D) The product was launched six months back  
 (E) One of the reasons is that, it is costly  
 (a) d b a e c (b) d b a c e  
 (c) e c d b a (d) c d b a e

17. The term 'gambit' is associated with which of the following sport?

- (a) Basket ball (b) Chess  
 (c) Boxing (d) Golf

18. Under the Ayushman Bharat programme, the government has set a target of eradicating Tuberculosis from the country by \_\_\_\_\_.

- (a) 2022 (b) 2023 (c) 2024 (d) 2025

19. Who is the author of the book named "Making India Awesome"?

- (a) Jairam Ramesh (b) Tarun Khanna  
 (c) Chetan Bhagat (d) Amitav Ghosh

20. Who among the following won gold medal in the 400-meter race at Nove Mesto in the Czech Republic in July 2019?

- (a) Preeti Singh (b) Ritu Kumari  
 (c) Sakshi Yadav (d) Hima Das

21. Which is the largest landlocked country in the World?

- (a) Mongolia (b) Bolivia  
 (c) Paraguay (d) Kazakhstan

22. Identify the Deputy Chief Ministers

- (a) Pilli Subhash Chandra Bose  
 (b) Sri. K. Narayana Swamy  
 (c) Smt. Pushpasreevani Pamula (d) All of the above

23. Identify the Navaratnas of the AP Government

- (a) YSR Ryuth Bharosa (b) Fee Reimbursement  
 (c) Arogyasri (d) All of the above

24. How much financial Assistance provide by the AP Government under the Ryuth Bharosa

- (a) 12500 (b) 15000 (c) 11000  
 (d) None of the above

25. In the 2019 to 2020 budget allocation how much farmer investment support was allocated

- (a) Rs. 3000 crore (b) Rs. 8750 crore  
 (c) Rs. 1420 crore (d) None of the above

26. Which of the following was the One Country and One Nation Scheme?

- (a) Pradhan Mantri Fasal Bima Yojana  
 (b) Atal Pension Yojana (c) Aaway Yojana  
 (d) None of the above

27. An iron needle sinks in water whereas a ship made of iron floats on it because

- (a) The edge of the needle is pointed  
 (b) The ship is flat  
 (c) The ship is driven by powerful engine  
 (d) Specific gravity of the needle is greater than that of water displaced by it

28. The cloudy nights are warmer than clear nights because

- (a) clouds prevent escape of radiation of heat from the ground and the air.  
 (b) absorb sunlight in the day and radiate the same in night  
 (c) clouds make the atmosphere damp and generate heat  
 (d) Clouds obstruct the movement of air which creates heat

29. Food gets cooked faster in a pressure cooker because

- (a) Water starts boiling at a lower temperature due to high pressure  
 (b) Water starts boiling at a higher temperature due to high pressure  
 (c) water boils only at 100° C but the heat content is higher at high pressure.  
 (d) Convection currents are set inside the cooker

30. Match List-I with List-II and select the correct answer from the codes given below:

List-I	List-II
A. Morphine	1. Antiseptic
B. Sodium	2. Alloy
C. Boric acid	3. Analgesic
D. German silver	4. Kerosene oil

Codes:

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

31. Match List-I with List-II and select the correct answer given below:

List-I	List-II
A. Electron	1. Goldstein
B. Proton	2. J.J. Thomson

C. Neutron  
D. Positron

Codes:

A B C D

(a) 2 1 3 4

(b) 4 3 1 2

(c) 2 1 4 3

(d) 4 3 2 1

32. Match List-I with List-II

List-I

A. Thomson model

B. Rutherford model

C. Bohr's model

D. de-Broglie theory

List-II

1. Dual nature of electron

2. Nuclear theory

3. Plum pudding model

4. Concept of quantization of energy

Codes:

A B C D

(a) 3 4 2 1

(b) 2 4 1 2

(c) 2 1 3 4

(d) 3 2 4 1

33. Consider the following statements about Vechur cattle breed

1. Vechur is the world's largest cow.

2. It is indigenous breed found in Kerala.

3. Its milk protein has medicinal value.

4. Commonly used in farming as draught animal.

Which of the statements given above are correct?

(a) 1, 2, 3 and 4

(b) 1, 2 and 3

(c) 2, 3 and 4

(d) 3 and 4

34. Consider the following statements:

1. Warm-blooded animals can remain active in cold environment in which cold-blooded animals can hardly move.

2. Cold-blooded animals require much less energy to survive than warm-blooded animals.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

35. Ecology deals with the study of:

a) Living beings

b) Living and non living components

c) Reciprocal relationship between living and non living components

d) Environment

36. Autecology deals with

a) Ecology of species      b) Ecology of many species

c) Ecology of community      (d) All the above

37. Synecology deals with

(a) Ecology of many species

(b) Ecology of many populations

(c) Ecology of community      (d) None of the above

38. Name the Sub-Collector of Rajahmundry who opened Anglo-vernacular schools at several places in Andhra

(a) Anderson

(b) Reverend Noble

(c) John Philip

(d) G.N. Taylor

39. In which year American Baptist Mission was established in Andhra

(a) 1866

(b) 1867

(c) 1868

(d) 1869

40. Which of the following Journals was started by Veeresalingam

(a) Hitabodhini

3. Chadwick      (b) Samasvardhini

4. Anderson

(c) Sanjivani

(d) Zanana

41. Which one among the following is not guaranteed by the constitution of India as a fundamental right?

(a) Freedom to move freely throughout the country

(b) Freedom to assemble peacefully without arms

(c) Freedom to own, acquire and dispose a property anywhere in the country

(d) Freedom to practice any trade or profession

42. Among the following whose term of office is the longest?

(a) President

(b) Member of lok sabha

(c) Comptroller and auditor general

(d) Vice-president

43. The maximum GAP between two sessions of parliament can be 6 months, which is calculated between

(a) Last sitting of one session to the last sitting of the next session

(b) Six calendar months excluding the months in which the session are held

(c) Last sitting of one session to the first sitting of the next session

(d) First sitting of two consecutive session

44. Indian constitution allows to acquire foreign territories. In this regard, out of the following statements identify the correct one?

(a) The acquisition does not fall within article 1 of the constitution

(b) Acquisition is governed by the international laws

(c) Acquired foreign territory shall become a part of existing states only

(d) The pre acquisition laws and the rights of acquired therein shall continue

45. The 73<sup>rd</sup> Amendment Act which was brought into force in 1993 added following number of articles to the Indian Constitution

(a) 5

(b) 9

(c) 12

(d) 16

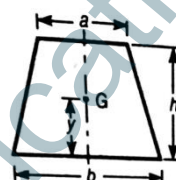
46. In the context of the 'Dulhan' scheme introduced by the Andhra Pradesh State government, which of the following statements is true?

(a) The scheme is intended to uplift the Muslim community in general

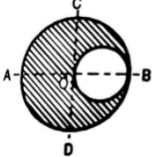
(b) Under this scheme the government will provide Rs. 50,000 to poor Muslim young women at the time of their marriage

(c) The cutoff date for implementing the scheme is May 26, 2015

(d) All the given answers are correct

47. Which of the following districts in Andhra Pradesh is called the production hub of spices?
- (a) Guntur (b) Krishna  
(c) Chittoor (d) YSR Kadapa
48. The "NTR Sujala" scheme aims at
- (a) Providing clean drinking water to every household in villages  
(b) Enhancing the nutritional standard of rural households  
(c) Reducing water pollution in villages by installing water recycling plants  
(d) None of the given answers are correct
49. In which district of Andhra Pradesh the scheduled tribe population is the highest?
- (a) East Godavari (b) Visakhapatnam  
(c) Krishna (d) Vizianagaram
50. Under the Indus Water Treaty (IWT) India had been given the exclusive rights over the rivers of
1. Chenab 2. Ravi  
3. Beas 4. Indus  
5. Sutlej 6. Jhelum
- Choose the correct answer from the codes given below:
- (a) 1, 2 and 3 only  
(b) 1, 3 and 4 only  
(c) 2, 3 and 5 only  
(d) 1, 2 and 6 only
51. According to IS: 456-1978, the total chloride content as percentage of mass of cement in concrete mix should be limited to
- (a) 0.06 (b) 0.10  
(c) 0.16 (d) 0.20
52. The obstacle, which obstructs chaining but not vision, is a
- (a) river (b) hill  
(c) rising ground (d) all of these
53. The pressure measured with the help of piezometer tube is in
- (a)  $N/mm^2$  (b)  $N/m^2$   
(c) head of liquid (d) all of these
54. Which of the following pump is generally used to pump highly viscous fluid?
- (a) Centrifugal pump (b) Reciprocating pump  
(c) Air lift pump (d) Screw pump
55. The angle of intersection of the horizon glass and index glass in an optical square is
- (a)  $30^\circ$  (b)  $45^\circ$  (c)  $60^\circ$  (d)  $75^\circ$
56. The purpose of lateral ties in short RC columns is to
- (a) avoid buckling of longitudinal bars  
(b) facilitate construction  
(c) facilitate compaction of concrete  
(d) increase the load carrying capacity of the columns
57. The point at which the resultant pressure on an immersed surface acts, is known as
- (a) centre of gravity (b) centre of depth  
(c) centre of pressure (d) centre of immersed surface
58. Varignon's theorem of moments states that if a number of coplanar forces acting on a particle are in equilibrium, then
- (a) their algebraic sum is zero  
(b) their lines of action are at equal distances  
(c) the algebraic sum of their moments about any point in their plane is zero  
(d) the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point
59. The compressive strength of brittle materials is \_\_\_\_ its tensile strength
- (a) equal to (b) less than  
(c) greater than (d) none of the above
60. A couple produces
- (a) translatory motion (b) rotational motion  
(c) combined translatory and rotational motion  
(d) none of the above
61. The centre of gravity of a trapezium with parallel sides a and b lies at a distance of y from the base b, as shown in given figure. The value of y is
- 
- (a)  $h \left( \frac{2a+b}{a+b} \right)$  (b)  $\frac{h}{2} \left( \frac{2a+b}{a+b} \right)$   
(c)  $\frac{h}{3} \left( \frac{2a+b}{a+b} \right)$  (d)  $\frac{h}{3} \left( \frac{a+b}{2a+b} \right)$
62. When the angular and linear measurements are equally precise in traversing, the balancing of a traverse is done by
- (a) transit rule (b) empirical rule  
(c) Bowditch's rule (d) any one of these
63. The diagonal tension which results in ultimate failure due to development of diagonal tension cracks, depends on
- (a) shear span (b) effective depth  
(c) both (a) and (b) (d) none of the above
64. A body floating in a liquid is said to be in neutral equilibrium, if its metacentre
- (a) coincides with its centre of gravity  
(b) lies above its centre of gravity  
(c) lies below its centre of gravity  
(d) lies between the centre of buoyancy and centre of gravity
65. The tensile strength of ductile material is \_\_\_\_ its compressive strength
- (a) equal to (b) less than  
(c) greater than (d) none of these
66. The projection of a traverse line on a line perpendicular to the meridian is known as
- (a) latitude of the line (b) departure of the line  
(c) bearing of the line (d) co-ordinate of the line



67. A circular hole of 50 mm diameter is cut in a circular disc of 100mm diameter as shown in figure. The center of gravity of the section will be
- 
- (a) in the shaded area (b) in the hole  
(c) at zero (d) none of these
68. A reinforced concrete beam is designed for the limit states of collapse in flexure and shear. Which of the following limit states of serviceability have to be checked?
1. deflection
  2. Cracking
  3. durability
- Select the correct answer using the codes given below:  
Codes:
- (a) 1 alone (b) 1 and 2  
(c) 2 and 3 (d) 1,2 and 3
69. The imaginary line drawn in the fluid in such a way that the tangent to any point gives the direction of motion at that point, is known as
- (a) path line (b) stream line  
(c) streak line (d) potential line
70. When a body is subjected to two equal and opposite forces, acting tangentially across the resisting section, as a result of which the body tends to shear off across the section, the stress and strain induced is
- (a) tensile stress, tensile strain  
(b) compressive stress, compressive strain  
(c) shear stress, tensile strain  
(d) shear stress, shear strain
71. In route surveys, the most suitable method of contouring is
- (a) by squares (b) by radial lines  
(c) by cross-sections (d) by tacheometer
72. Mass moment of inertia of a uniform thin rod of mass M and length(l) about its mid-point and perpendicular to its length is
- (a)  $\frac{2}{3} MI^2$  (b)  $\frac{1}{3} MI^2$   
(c)  $\frac{3}{4} MI^2$  (d)  $\frac{4}{3} MI^2$
73. The total head of a liquid particle in motion is equal to
- (a) pressure head +kinetic head + potential head  
(b) pressure head -(kinetic head + potential head)  
(c) potential head -(pressure head + kinetic head)  
(d) kinetic head -(pressure head + potential head)
74. The maximum bending moment of simply supported beam of span l and carrying a point load W at the centre of beam, is
- (a)  $\frac{Wl}{4}$  (b)  $\frac{Wl}{2}$   
(c) Wl (d)  $\frac{Wl^2}{4}$
75. The probability of failure implied in limit state design is of the order of
- (a)  $10^{-2}$  (b)  $10^{-3}$   
(c)  $10^{-4}$  (d)  $10^{-5}$
76. In a four high rolling mill, the diameter of backing up rolls is \_\_\_\_\_ the diameter of working rolls.
- (a) equal to (b) smaller than  
(c) larger than (d) none of the above
77. Moment of inertia of a circular section about an axis perpendicular to the section is
- (a)  $\frac{\pi d^3}{16}$  (b)  $\frac{\pi d^3}{32}$   
(c)  $\frac{\pi d^4}{32}$  (d)  $\frac{\pi d^4}{64}$
78. The effective width 'b<sub>f</sub>' of flange of a continuous T-beam in a floor system is given by
- $$B_f = L_o/6 + b_w + 6 D_f$$
- Where L<sub>o</sub> represents the
- (a) distance between points of contraflexure in a span  
(b) effective span of beams  
(c) clear span of beams  
(d) spacing between beams
79. In a venturimeter, the velocity of liquid at throat is \_\_\_\_\_ than at inlet
- (a) higher (b) lower  
(c) equal to (d) none of the above
80. If the section modulus of a beam is increased, the bending stress in the beam will
- (a) not change (b) increase  
(c) decrease (d) may increase or decrease
81. Moment of inertial of a triangular section of base (b) and height(h) about an axis passing through its vertex and parallel to the base, is \_\_\_\_\_ than that passing through its C.G and parallel to the base
- (a) nine times (b) six times  
(c) four times (d) two times
82. As per IS:456, side face reinforcement, not less than 0.05% of web area, is provided on each side when the depth of web is not less than
- (a) 300 mm (b) 400 mm  
(c) 500 mm (d) 750 mm
83. The discharge through a venturimeter is given by
- (a)  $\frac{C_d \sqrt{a_1^2 - a_2^2}}{a_1 a_2} \sqrt{2gh}$  (b)  $\frac{C_d a_1 a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$   
(c)  $\frac{C_d (a_1 - a_2)}{a_1 + a_2} \sqrt{2gh}$  (d)  $\frac{C_d \sqrt{a_1 a_2}}{a_1 + a_2} \sqrt{2gh}$
- Where C<sub>d</sub> = Coefficient of discharge  
a<sub>1</sub> = area of inlet, a<sub>2</sub> = area of throat and  
h = Venturi-head
84. The process extensively used for making bolts and nuts is
- (a) hot piercing (b) extrusion  
(c) cold peening (d) cold heading

85. The moment of inertia of a thin spherical shell of mass  $m$  and radius  $r$ , about its diameter is  
 (a)  $mr^2/3$  (b)  $2mr^2/3$   
 (c)  $2mr^2/5$  (d)  $3mr^2/5$
86. The loss of head at entrance in a pipe is  
 (a)  $\frac{v^2}{2g}$  (b)  $\frac{0.5v^2}{2g}$   
 (c)  $\frac{0.375 v^2}{2g}$  (d)  $\frac{0.75v^2}{2g}$   
 Where  $v$  = velocity of liquid in the pipe
87. The reinforcement for tension, when required in members, shall consist of  
 (a) only longitudinal reinforcement in the tension face  
 (b) only longitudinal reinforcement in the compression face  
 (c) only two legged closed loops enclosing the corner reinforcement  
 (d) both longitudinal and transverse reinforcement
88. A square beam and a circular beam have the same length, same allowable stress and the same bending moment. The ratio of weights of the square beam to the circular beam is  
 (a)  $\frac{1}{2}$  (b) 1  
 (c)  $\frac{1}{1.12}$  (d)  $\frac{1}{\sqrt{2}}$
89. The adhesiveness is the property of a sand due to which  
 (a) it evolves a great amount of steam and other gases  
 (b) the sand grains stick together  
 (c) it cling to the sides of a moulding box  
 (d) none of these
90. The maximum permissible shear stress  $\tau_{c, \max}$  given in BIS:456-1978 is based on  
 (a) diagonal tension failure  
 (b) diagonal compression failure  
 (c) flexural tension failure  
 (d) flexural compression failure
91. In general method of drawing an ellipse, a vertical line called as \_\_\_\_ is drawn first.  
 (a) Tangent (b) Normal  
 (c) Major axis (d) Directrix
92. The power transmitted through the pipe is maximum when the head lost due to friction is equal to  
 (a) one-fourth of total supply head  
 (b) one-third of total supply head  
 (c) one-half of the total supply head  
 (d) two-third of the total supply head
93. Green sand is a mixture of  
 (a) 30% sand and 70% clay  
 (b) 50% sand and 50% clay  
 (c) 70% sand and 30% clay  
 (d) 90% sand and 10% clay
94. The load carrying capacity of a column designed by working stress method is 500kN. The collapse load of the column is  
 (a) 500.0 kN (b) 662.5 kN  
 (c) 750.0 kN (d) 1100.0 kN
95. When a shaft is subjected to torsion, the shear stress induced in the shaft varies from  
 (a) minimum at the centre to maximum at the circumference  
 (b) maximum at the centre to minimum at the circumference  
 (c) zero at the centre to maximum at the circumference  
 (d) maximum at the centre to zero at the circumference
96. The siphon will work satisfactorily, if the minimum pressure in the pipe is \_\_\_\_ vapour pressure of the liquid  
 (a) equal to (b) less than  
 (c) more than (d) none of these
97. Which of the following welding method uses a pool of molten metal?  
 (a) Carbon arc welding  
 (b) Submerged arc welding  
 (c) TIG arc welding  
 (d) MIG arc welding
98. If information about the major and minor axes of ellipse is given then by how many methods can we draw the ellipse?  
 (a) 2 (b) 3 (c) 4 (d) 5
99. Match List I with List II and select the correct answer using the codes given below the lists:  
 List I  
 A. Modular ration  
 B. Seismic forces  
 C. Pedestal  
 D. Composite Column  
 List II  
 1. Increase of permissible stresses  
 2. Minimum eccentricity  
 3. Limit state method  
 4. Metal core  
 5. Permissible compressive stress due to bending in concrete  
 Codes:
- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 5 | 1 | 2 | 4 |
| (b) | 4 | 2 | 3 | 5 |
| (c) | 5 | 2 | 3 | 4 |
| (d) | 4 | 1 | 2 | 5 |
100. The hammer blow in pipes occurs when  
 (a) there is excessive leakage in the pipe  
 (b) the pipe bursts under high pressure of fluid  
 (c) the flow of fluid through the pipe is suddenly brought to the rest by closing of the valve  
 (d) the flow of fluid through the pipe is gradually brought to rest by clothing of the valve
101. The temperature produced by oxy-hydrogen flame is about  
 (a) 1800°C (b) 2100°C  
 (c) 2400°C (d) 3200°C
102. In arcs of circles method, the foci are constructed by drawing arcs with centre as one of the ends of the \_\_\_\_ axis and the radius equal to the half of the \_\_\_\_ axis.  
 (a) Minor, major (b) Major, major  
 (c) Minor, minor (d) Major, minor
103. How is the depth of footing for an isolated column governed?

1. By maximum bending moment
2. By shear force
3. By punching shear

Select the correct answer using the codes given below:

- (a) 2 and 3 only                      (b) 1 and 2 only  
(c) 1 and 3 only                      (d) 1, 2 and 3

**104.** The force exerted by a jet of water impinging normally on a plate which due to the impact of jet, moves in the direction of jet with a velocity  $v$  is

- (a)  $\frac{wa(V-v)}{2g}$                               (b)  $\frac{wa(V-v)}{g}$   
(c)  $\frac{wa(V-v)^2}{2g}$                                   (d)  $\frac{wa(V-v)^2}{g}$

**105.** Galvanizing is a

- (a) zinc diffusion process  
(b) process of coating zinc by hot dipping  
(c) process used for making thin phosphate coating on steel  
(d) none of the above

**106.** The strain energy stored in hollow circular shaft of outer diameter ( $D$ ) and inner diameter ( $d$ ) subjected to shear stress is

- (a)  $\frac{\tau^2}{2C} \left( \frac{D^2 - d^2}{D} \right) \times \text{Volume of shaft}$   
(b)  $\frac{\tau^2}{2C} \left( \frac{D^2 + d^2}{D} \right) \times \text{Volume of shaft}$   
(c)  $\frac{\tau^2}{4C} \left( \frac{D^2 - d^2}{D} \right) \times \text{Volume of shaft}$   
(d)  $\frac{\tau^2}{4C} \left( \frac{D^2 + d^2}{D} \right) \times \text{Volume of shaft}$

**107.** In a reinforced concrete section, shear stress distribution is diagrammatically

- (a) Wholly Parabolic  
(b) Wholly Rectangular  
(c) Parabolic above NA and Rectangular below NA  
(d) Rectangular above NA and Parabolic below NA

**108.** A jet of water is striking at the centre of curved vane moving with a uniform velocity in the direction of jet. For the maximum efficiency, the vane velocity is \_\_\_\_\_ of the jet velocity

- (a) one-half                              (b) one-third  
(c) two-third                              (d) three-fourth

**109.** Hard and tough materials like cast iron should be turned at

- (a) slow speed                              (b) high speed  
(c) any speed                              (d) certain specific speed

**110.** If the stirrup spacing is equal to 0.75 times the effective depth of an RC beam, then the shear capacity of stirrup steel is equal to

- (a)  $1.25 (f_y A_{sv})$                       (b)  $1.16 (f_y A_{sv})$   
(c)  $1.08 (f_y A_{sv})$                       (d)  $1.00 (f_y A_{sv})$

Where  $f_y$  is yield strength and  $A_{sv}$  is cross-sectional area of the stirrup steel

**111.** Steps are given to find the axis of a parabola. Arrange the steps.

- i. Draw a perpendicular GH to EF which cuts parabola.
- ii. Draw AB and CD parallel chords to given parabola at some distance apart from each other.
- iii. The perpendicular bisector of GH gives axis of that parabola.
- iv. Draw a line EF joining the midpoints to AB and CD.

- (a) i, ii, iii, iv                              (b) ii, iv, i, iii  
(c) iii, iv, i, ii                              (d) iv, i, ii, ii

**112.** A feed gear box for a screw cutting lathe is designed on the basis of

- (a) geometric progression              (b) arithmetic progression  
(c) harmonic progression              (d) none of these

**113.** The gross or total head of the turbine is the \_\_\_\_\_ of the water levels at the head race and tail race

- (a) sum                                      (b) difference  
(c) product                                  (d) none of these

**114.** A T-beam becomes identical to a rectangular beam with width equal to its flange width when the neutral axis is

- (a) Through the geometrical centre of the beam  
(b) At the junction of the rib and the flange  
(c) Below the slab  
(d) Within the flange

**115.** A shaft of diameter  $D$  is subjected to a twisting moment ( $T$ ) and a bending moment ( $M$ ). If the maximum bending stress is equal to maximum shear stress developed, then  $M$  is equal to

- (a)  $T/2$                                       (b)  $T$   
(c)  $2T$                                       (d)  $4T$

**116.** Which of the following constructions use hyperbolic curves?

- (a) Cooling towers                      (b) Dams  
(c) Bridges                                  (d) Man-holes

**117.** Manometric head, in case of a centrifugal pump, is equal to

- (a) suction lift+ loss of head in suction pipe due to friction + Delivery lift + Loss of head in delivery pipe due to friction + Velocity head in the delivery pipe  
(b) Workdone per kN of water – Losses within the impeller  
(c) Energy per kN at outlet of impeller- Energy per kN at inlet of impeller  
(d) all of the above

**118.** An invar tape is generally used for accurate measurement of distance because it possesses \_\_\_\_\_ coefficient of thermal expansion

- (a) zero                                      (b) low  
(c) high                                      (d) none of these

**119.** The operation of smoothing and squaring the surface around a hole is known as

- (a) counter- sinking                      (b) counter- boring  
(c) repanning                              (d) spot facing

120. When the length of chain used in measuring distance is longer than the standard length, the error in measured distance will be  
 (a) positive error (b) negative error  
 (c) compensating error (d) none of these
121. Which of the following is the eccentricity for hyperbola?  
 (a) 1 (b) 3/2 (c) 2/3 (d) 1/2
122. For harder alloy steel, the point angle of the drill is kept  
 (a) equal to 118° (b) less than 118°  
 (c) more than 118° (d) any one of these
123. At the magnetic poles, the amount of dip is  
 (a) 0° (b) 45° (c) 60° (d) 90°
124. In a planer  
 (a) tool is stationary and work reciprocates  
 (b) work is stationary and tool reciprocates  
 (c) tool moves over stationary work  
 (d) tool moves over reciprocating work
125. When a shaft of diameter D is subjected to a twisting moment (T) and a bending moment (M), then the maximum normal stress is given by  
 (a)  $\frac{16}{\pi D^3} [\sqrt{M^2 + T^2}]$  (b)  $\frac{16}{\pi D^3} [\sqrt{M^2 - T^2}]$   
 (c)  $\frac{16}{\pi D^3} [M + \sqrt{M^2 + T^2}]$  (d)  $\frac{16}{\pi D^3} [M - \sqrt{M^2 + T^2}]$
126. The lines passing through points at which the magnetic declination is equal at a given time are called  
 (a) isogonic lines (b) agonic lines  
 (c) isoclinic lines (d) none of these
127. Buffing wheels are made of  
 (a) softer metals (b) cotton fabric  
 (c) carbon (d) graphite
128. The horizontal angle between the true meridian and a survey line is called  
 (a) magnetic bearing (b) azimuth  
 (c) dip (d) magnetic declination
129. Mechanical efficiency of a centrifugal pump is ratio of  
 (a) energy available at the impeller to the energy supplied to the pump by the prime mover  
 (b) actual workdone by the pump to the energy supplied to the pump by the prime mover  
 (c) energy supplied to the pump to the energy available at the impeller  
 (d) manometric head to the energy supplied by the impeller per kN of water
130. In down milling, the thickness of chip is  
 (a) minimum at the beginning of the cut and maximum at the end of the cut  
 (b) maximum at the beginning of the cut and minimum at the end of the cut  
 (c) uniform throughout the cut  
 (d) none of these
131. Steps are given to locate the directrix of hyperbola when axis and foci are given. Arrange the steps.  
 i. Draw a line joining A with the other Focus F.  
 ii. Draw the bisector of angle FAF1, cutting the axis at a point B.  
 iii. Perpendicular to axis at B gives directrix.  
 iv. From the first focus F1 draw a perpendicular to touch hyperbola at A.  
 (a) i, ii, iii, iv (b) ii, iv, i, iii  
 (c) iii, iv, i, ii (d) iv, i, ii, iii
132. Multi-stage centrifugal pumps are used to  
 (a) give high discharge (b) produce high heads  
 (c) pump viscous fluids (d) all of these
133. The capacity of a telescope of producing a sharp image is called its  
 (a) definition (b) brightness  
 (c) sensitivity (d) magnification
134. The asymptotes of any hyperbola intersects at \_\_\_\_\_  
 (a) On the directrix (b) On the axis  
 (c) At focus (d) Centre
135. Gear burnishing is a process for  
 (a) surface finishing (b) under-cut gears  
 (c) cycloidal gears  
 (d) removing residual stresses from teeth roots
136. The resultant of two forces P and Q (such that P>Q) acting along the same straight line, but in opposite direction, is given by  
 (a) P+Q (b) P-Q  
 (c) P/Q (d) Q/P
137. The multiplying constant for the tacheometer is  
 (a) f/i (b) i/f  
 (c) f/d (d) f+d  
 Where f = Focal length of the objective  
 i = interval between the stadia lines or hairs, and  
 d = Horizontal distance from the optical centre to the vertical axis of the tacheometer
138. In a reciprocating pump, air vessels are used to  
 (a) smoothen the flow (b) reduce suction head  
 (c) increase delivery head  
 (d) reduce acceleration head
139. The specific weight of sea water is \_\_\_\_\_ that of pure water  
 (a) same as (b) less than  
 (c) more than (d) none of the above
140. The optical square is used to measure angles by  
 (a) refraction (b) reflection  
 (c) double refraction (d) double reflection
141. Two points are placed in 1st quadrant of projection planes such that the line joining the points is perpendicular to profile plane the side view and top view will be \_\_\_\_\_  
 (a) single point, two points  
 (b) two points, single point  
 (c) single point, single point (d) two points, two points
142. If the net positive suction head (NPSH) requirement for the pump is not satisfied, then  
 (a) no flow will take place  
 (b) cavitation will be formed (c) efficiency will be low  
 (d) excessive power will be consumed



143. The viscosity of water is \_\_\_\_\_ than that of \_\_\_\_\_  
(a) higher (b) lower  
(c) equal to (d) none of these
144. The difference between the sum of the angles of a spherical triangle on the earth's surface and the angles of the corresponding plane triangle for every  $195.5 \text{ km}^2$  of area is only  
(a) 1 second (b) 5 second  
(c) 10 second (d) 15 second
145. The angle between two forces when the resultant is maximum and minimum respectively are  
(a)  $0^\circ$  and  $180^\circ$  (b)  $180^\circ$  and  $0^\circ$   
(c)  $90^\circ$  and  $180^\circ$  (d)  $90^\circ$  and  $0^\circ$
146. A point is 8 units away from the vertical plane and 2 units away from profile plane and 4 units away from horizontal plane in 1st quadrant then the projections are drawn on paper the distance between the side view and front view of point is \_\_\_\_\_  
(a) 12 units (b) 6 units  
(c) 10 units (d) 8 units
147. The intensity of pressure at any point, in a liquid, is
- (a) directly proportional to the area of the vessel containing liquid  
(b) directly proportional to the depth of the liquid from the surface  
(c) directly proportional to the length of the vessel containing liquid  
(d) inversely proportional to the depth of the liquid from the surface
148. In order to avoid cavitation in centrifugal pumps  
(a) the suction pressure should be high  
(b) the delivery pressure should be high  
(c) the suction pressure should be low  
(d) the delivery pressure should be low
149. A tie line in a chain surveying  
(a) checks the accuracy of the framework  
(b) enables the surveyor to locate the interior details which are far away from the main chain lines  
(c) fixes up the directions of all other lines  
(d) all of the above
150. The pressure measured with the help of a pressure gauge is called  
(a) atmospheric pressure (b) gauge pressure  
(c) absolute pressure (d) mean pressure

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

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AP GRAMA/WARD SACHIVALAYAM GRAND TEST - 2 ANSWER KEY  
GROUP A

1	a	21	d	41	c	61	c	81	a	101	c	121	b	141	a
2	a	22	d	42	c	62	c	82	d	102	a	122	c	142	b
3	c	23	d	43	c	63	c	83	b	103	a	123	d	143	a
4	a	24	a	44	b	64	a	84	d	104	d	124	a	144	a
5	a	25	b	45	d	65	c	85	b	105	b	125	c	145	a
6	d	26	a	46	b	66	b	86	b	106	d	126	a	146	c
7	b	27	d	47	a	67	a	87	d	107	c	127	b	147	b
8	b	28	a	48	a	68	b	88	c	108	b	128	b	148	a
9	d	29	a	49	b	69	b	89	c	109	a	129	a	149	b
10	d	30	d	50	c	70	d	90	b	110	b	130	b	150	b
11	b	31	a	51	c	71	c	91	d	111	b	131	d		
12	b	32	d	52	a	72	b	92	b	112	a	132	b		
13	b	33	c	53	c	73	a	93	c	113	b	133	a		
14	b	34	b	54	d	74	a	94	c	114	d	134	d		
15	a	35	c	55	b	75	a	95	c	115	a	135	a		
16	a	36	a	56	a	76	b	96	c	116	a	136	b		
17	b	37	c	57	c	77	c	97	b	117	d	137	a		
18	d	38	d	58	d	78	a	98	d	118	b	138	d		
19	c	39	a	59	c	79	a	99	a	119	d	139	c		
20	d	40	b	60	b	80	c	100	c	120	b	140	b		