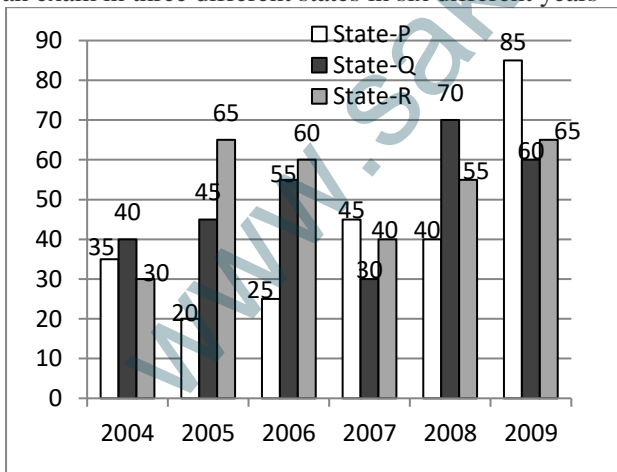# AP GRAMA/WARD SACHIVALAYAM GRAND TEST – 3
GROUP A

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

1. The speed of a boat in still water is 9 km/h. A boat goes 72 km and back to its starting point in 18 hours. Find the speed of stream?
   (a) 3 km/hr   (b) 4 km/hr
   (c) 5 km/hr   (d) 6 km/hr

2. Rs. 500 is divided among A, B, C in such a way that Rs. 16 more 2/5 of A's share, Rs. 70 less than 3/4 of B's share, and Rs. 4 less than 3/5 of C's share are equal. Find B's share.
   (a) Rs. 300   (b) Rs. 400 (c) Rs. 100   (d) Rs. 200

3. A reduction of 20% in the price of Rice enables a Purchase to obtain 8kg more Rice for Rs. 160. Then the price per kg before reduction was
   (a) 5 per kg   (b) 6 per kg
   (c) 7 per kg   (d) 8 per kg

4. A man can row at a speed of $4\frac{1}{2}$ km/hr in still water. If he takes 2 times as long to row a distance upstream as to row the same distance in downstream, then, the speed of stream (in km/hr) is
   (a) 1   (b) 1.5   (c) 2   (d) 2.5

5. The area of a rhombus having one side 10 cm and one diagonal 12 cm is
   (a) 48 cm^2 (b) 96 cm^2 (c) 144 cm^2 (d) 192 cm^2
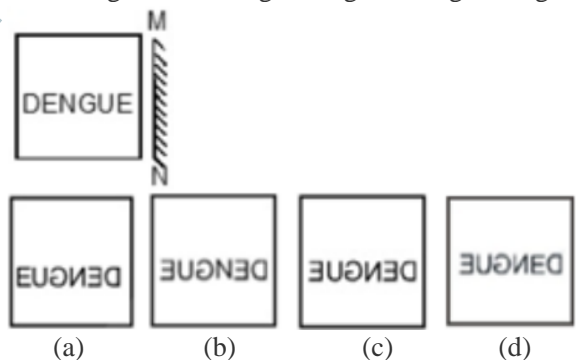
Directions (6-8): Study the following graphs carefully to answer the questions that follow.

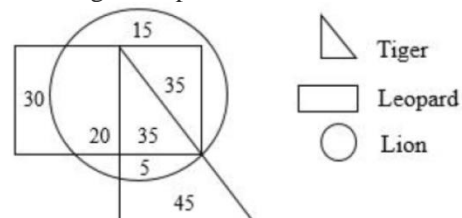Number of Candidates (in thousands) who qualified in an exam in three different states in six different years

6. Total number of candidates who qualified in the exam in the year 2004 and 2005 together from state Q was approximately what percentage of total number of candidates who qualified in the exam from all the states together in the year 2008?
   (a) 61   (b) 65   (c) 79   (d) 52

7. What was the respective ratio between the number of candidate who qualified in the exam from state - R in the year 2008 and the number of candidates who qualified in the exam from state - P in the year 2004?
   (a) 11:10   (b) 9:11   (c) 11:7   (d) 11:9

8. If 40 per cent of the candidates who qualified in the exam from state- P in the year 2009 were females then what was the sum of number of male candidates who qualified from State - P in the year 2009 and the total number of candidates who qualified in the exam from state - Q in the year 2009?
   (a) 1,11,000   (b) 1,01,000   (c) 93,000
   (d) 1,21,000

9. If "S" denotes "multiplied by", "V" denotes "subtracted from", "M" denotes "added to" and "L" denotes "divided by", then 7 V 42 M 56 L 8 S 5 = ?
   (a) 8   (b) 12   (c) 20   (d) 0

10. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?

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

11. Mohan, Ritika, Janvi, Priya and Riya are friends. Janvi runs faster than Ritika but slower than Priya. Mohan is the slowest runner and Riya runs faster than Priya. Who runs the fastest among the five?
   (a) Priya   (b) Riya   (c) Ritika   (d) Mohan

12. The diagram represents the likes of children in a society.

The difference between children who like leopard to those who like tiger is
   (a) 50   (b) 35   (c) 30   (d) 5

13. Which answer figure will complete the pattern in the question figure?

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

Directions (Q. No. 14) : In the following questions 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. _____ lunch we had at your marriage was superb.
(a) a   (b) the   (c) an   (d) No article

Direction (Q. no. 15) : In the following question a idiom is given. And it is followed by four options namely a, b, c and d. One of the options gives the meaning of the idiom. Choose the appropriate option.

15. To grease the palm
(a) To bribe   (b) To reject
(c) To maintain   (d) To hold

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) He borrowed some money from his neighbor for me
(B) However, he promised to get the money I needed
(C) Since I had no money with me, I decided to borrow from my friend
(D) The electricity bill had to be paid immediately
(E) But, he had no money with him to lend me
(a) c d a b e   (b) c e b a d
(c) a b c d e   (d) d c e b a

17. The 'Dadasaheb Phalke Award' is India's highest award in which of the following fileds?
(a) Sport (b) Business (c) Science (d) Cinema

18. Chandrayaan-2, India's second mission to the Moon will be launched by the launch vehicle_____
(a) PSLV-XL   (b) GSLV-II
(c) GSLV-Mk III   (d) RLV-TD

19. With which country did India hold high-level talks in July 2019 to elevate bilateral cooperation in the field of space, including assistance in India's 'Gaganyaan' mission?
(a) Japan (b) Russia (c) China (d) Indonesia

20. 'Game Changer' is the autobiography of which of the following cricketers?
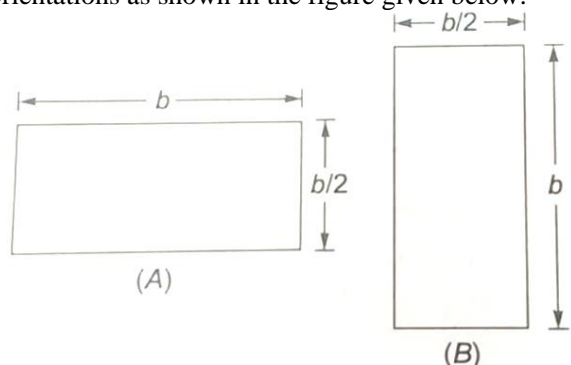(a) Shane Watson   (b) Shahid Afridi
(c) Lasith Malinga   (d) Chris Gayle

21. Longest serving Chief Minister of any state Pawan Kumar Chamling lost after 25 years. He was the Chief Minister of which state?
(a) Sikkim   (b) Bihar   (c) Assam   (d) Odisha

22. **How many sustainable development goals are there**
(a) 17 (b) 26 (c) 16 (d) 15

23. It is more comfortable to wear white cloths in summer because
(a) they reflect heat falling on them.
(b) they radiate heat tansferred from the body.
(c) they absorb perspiration.
(d) they are soothing to the eye

24. **The pyramid of energy in any ecosystem is**
a) Always upright   b) May be upright or invented
c) Always inverted   d) None of the above

25. **An ecosystem must have continuous external source of**
a) minerals b) energy c) food d) All of the above

26. In which place people revolted against English against their forest policies in 1879
(a) Rekapalli   (b) Nadigudem
(c) Chinturu   (d) Sileru

27. Which organization took active part in organizing Bipin Chandra Pal's tour of Rajahmundry
(a) Balabharati Samithi (b) Surabharathi Samithi
(c) Youngmen's association
(d) Rajahmundry Students association

28. Which Newspaper strongly supported the Home Rule Movement in Andhra
(a) Andhra Matha   (b) Bharata Matha
(c) Teja   (d) Desha Matha

29. Who among the following visited the Palnadu area in July 1921 to study the situation arising out of agitation against forest laws
(a) Vedam Venkatachari   (b) Ramadas Pantulu
(c) Unnava Lakshminarayana (d) Swamy Sitaram

30. In the elections held to the Madras Legislative Assembly in 1920, how many seats were won by the justice party
(a) 63 (b) 64 (c) 65 (d) 66

31. Who among the following wrote the Novel 'Asamarthuni Jeevitha Yatra'
(a) N.G. Ranga   (b) Sri Sri
(c) K. Linga Raju   (d) T. Gopichand

32. In which year the socialist party established its Andhra Branch
(a) 1930   (b) 1931   (c) 1932 (d) 1934

33. Which Telugu Newspaper commented "unless there is a separate government there is no protection for Telugu People's Culture"
(a) Desha Bhasha   (b) Lokamanjari
(c) Desabhimani   (d) Shasirekha

34. Who among the following opposed separate state for Andhras once he became Chief Minister of Madras State in 1932
(a) P. Ramarayanin Garu   (b) P. Subbarayan
(c) K.V. Reddy Naidu   (d) Bobbili Raja

35. In which place in 1935, the second Rayalaseema Mahasabha passed a resolution opposing separate Andhra State
(a) Kadapa   (b) Kurnool
(c) Tirupathi (d) Anantapur

36. The agreement between Andhra and Rayalaseema leaders was made in 1937 at the residence of Kasinathuni Nageshwar Rao known as Sribagh pact. Where is Sribagh
(a) Vijayawada   (b) Guntur
(c) Madras   (d) Bangalore

37. In 1948 which Commission, in its report opined that creation of linguistic states is a threat to unity and integrity of the country
(a) J.V.P. Report   (b) Dhar Commission
(c) Krishnamachary Commission
(d) Wanchoo Commission

38. The doctrine of "Paramountcy" is a legal principle:

(a) To reconcile conflicting laws where both central government and provincial governments have the power to create laws in relation to the same matter

(b) To explain the law making authority of the government

(c) To provide law making authority to the central government

(d) To explain law making authority of the country

39. With regard to officers of all India services, choose the correct answer from the following

(a) A member of an all India Service can be dismissed or removed only by the Union government

(b) A member of an all India service can be dismissed or removed by the state government also if he/se is serving under that state

(c) In India, state government employees administer state laws only

(d) Union government administer union laws through its departments only

40. Regarding the amendment of the constitution all following statements are correct, except

(a) According to Article 368, parliament of India can amend any part of the constitution

(b) Article 2 of the constitution empowered the parliament of India to admit new states into the Union

(c) With reference to Article 2 or 3, the amendment of the provisions of FIRST and FOURTH schedule shall not be deemed to be an amendment of the constitution for the purpose of Article 368

(d) The territories of the units of the federation may be altered or re-distributed by the parliament without intimation to the states

41. Whit regards to fundamental rights, all statements below are correct, except

(a) Article 15 is for citizens only

(b) The right reserved for citizens are denied to the aliens

(c) Aliens are divided into friendly aliens and enemy aliens

(d) Indian constitution shows no difference between friendly aliens and enemy aliens

42. Which of the following articles of the Indian constitution explain about the citizenship?
(a) Articles 5 to 8   (b) Articles 6 to 8

(c) Articles 4 to 8   (d) Articles 3 to 8

43. Which of the following is not the supreme court's evolution?
(a) Basic structure   (b) Public interest litigation

(c) Removal of hand cuffs

(d) Exemptions to fundamental rights

44. Which of the following groups of countries is arranged in descending order of area?
(a) Russia, Canada, China, U.S.A.
(b) Russia, U.S.A., Canada, China
(c) Russia, Canada, U.S.A., China
(d) Russia, China, U.S.A., Canada

45. Sierra Nevada is the name of
(a) An animal of America
(b) A disease found in America
(c) A fruit found in America
(d) A mountain in America

46. Which of the following is not a coal filed?
(a) Raniganj (b) Umaria   (c) Mosabani (d) Korba

47. The Radcliffe Line is the international border between
(a) India and Pakistan   (b) India and China
(c) Indian and Bangladesh   (d) India and Nepal

48. What is Durand Line?
(a) Boundary line between Afghanistan and Pakistan
(b) Boundary line between India and Pakistan
(c) Boundary line between India and China
(d) Boundary line between India and Burma

49. Which of the following will never get the vertical rays of the sun?
(a) Srinagar (b) Mumbai
(c) Chennai (d) Thiruvananthapuram

50. What is Durand Line?
(a) Boundary line between Afghanistan and Pakistan
(b) Boundary line between India and Pakistan
(c) Boundary line between India and China
(d) Boundary line between India and Burma

51. In case of laminar flow, the
(a) flow is irregular
(b) losses are of prime importance
(c) Reynold's number lies between 2000 to 3000 for pieces
(d) Newton's law of viscosity is of importance

52. In lathe, the carriage and tail stock are guided on......
(a) Same guideways
(b) Different guideways
(c) Any of the above
(d) Not guided on guideways

53. Which one of the following is the correct expression to estimate the development length of deformed reinforcing bar as per IS code in limit state design?
(a) $\frac{\phi\sigma_s}{4\tau_{bd}}$ (b) $\frac{\phi\sigma_s}{4.5\tau_{bd}}$ (c) $\frac{\phi\sigma_s}{6.4\tau_{bd}}$ (d) $\frac{\phi\sigma_s}{8\tau_{bd}}$

54. Fly leveling is carried out from a point 1 having R.L 560.5 to point 2. If $\Sigma BS = 6.475$ and $\Sigma F.S = 8.565$, R. L of point 2 is
(a) 562.59   (b) 558.41   (c) 563.90   (d) 557.50

55. Parkerizing process is......
(a) zinc diffusion process
(b) An oxidising process used for aluminium and magnesium articles

(c) A process used for making thin phosphate coating in steel to act as a base or primer for enamels and paints

(d) Is the process of coating of zinc by hot dipping

56. Liquids transmit pressure equally in all direction and at right angle to the surface exposed. This statement known as__

(a) Bernoulli's theorem (b) Archimedes' principle

(c) Pascal's law (d) Principle of floatation

57. A square column section of size 350 mm × 350 mm is reinforced with four bars of 25 mm diameter and four bars of 16 mm diameter. Then the transverse steel should be

(a) 5 mm dia @240 mm c/c

(b) 6 mm dia @250 mm c/c

(c) 8 mm dia @250 mm c/c

(d) 8 mm dia @350 mm c/c

58. The simplest resultant of a spatial parallel force system is always

(a) a wrench (b) a force

(c) a moment (d) a force and moment

59. The deformation of a bar under its own weight as compared to that when subjected to direct axial load equal to its own weight will be

(a) the same (b) one fourth (c) half (d) double

60. A rigid body is in equilibrium. Given that the moment of all the forces acting on the body about some axis is zero and also given that forces are concurrent, implies that

(a) the resultant force is zero

(b) the forces have a line of action passing through the axis

(c) the resultant forces have a line of action parallel to the axis

(d) any of (a), (b), (c) can be true

61. A body is acted upon by a force system. It can in general to brought to equilibrium by the application of

(a) a force acting on a suitable point on the body

(b) a force acting anywhere along a suitable line

(c) a force acting along a suitable line and a moment along the direction of the force

(d) a wrench acting anywhere on the body.

62. Which process squeezes metals into peaks and troughs with plastic deformation?

(a) Grooving (b) Knurling

(c) Reaming (d) None of the above

63. According to principle of floatation, the weight of liquid displaced as compared to the weight of the body is

(a) more (b) less

(c) same (d) depending upon the shape of the body

64. In a Pedestal, the factor by which the effective length should not exceed the least lateral dimension is

(a) 2 (b) 3 (c) 4 (d) 5

65. A solid uniform metal bar of diameter D and length L is hanging vertically from its upper end. The elongation of the bar due to self weight is

(a) Proportional to L and inversely proportional to D^2

(b) Proportional to L^2 and inversely proportional to D^2

(c) proportional to L but independent of D

(d) Proportional to L^2 but independent of D

66. Which of the following statements are true for ultrasonic welding?

1. Productivity of ultrasonic welding is high

2. Thin pieces can be welded to thicker pieces by ultrasonic welding

3. Ultrasonic welds contain foreign inclusions

4. Post cleaning of welds is necessary in ultrasonic welding

5. Preparation required for ultrasonic welding process is very little

(a) (1), (2) and (4)

(b) (2), (3) and (4)

(c) (1), (3) and (5)

(d) (1), (2) and (5)

67. The centre of volume and centre of mass of a body coincide.

(a) if and only if the body is of uniform density

(b) if the body is geometrically symmetrical about the centre of mass.

(c) if the density variation is symmetrical about the centroid.

(d) if and only if the body is made homogeneous material

68. A body can be made to float by

(a) decreasing its volume

(b) increasing its weight

(c) decreasing both its volume and weight

(d) increasing the volume of the body, weight remaining the same

69. A masonry wall has height 'h', length L and thickness 't'. The allowable stress based on slenderness is calculated on the basis of

(a) h/t only (b) L/t only

(c) lesser of L/t and h/t (d) greater of L/t and h/t

70. The Poisson ratio of a material which has Young's modulus of 120 GPa and shear modulus of 50 GPa, is

(a) 0.1 (b) 0.2 (c) 0.3 (d) 0.4

71. The position of gear cutter on the arbor for rack milling is?

(a) Nearer to the column

(b) Nearer to the arbor support

(c) At the middle

(d) At any point on the arbor

72. The first moment of area of a semicircular area about its diameter d is given by

(a) $d^3/12$ (b) $d^3/24$ (c) $d^3/6$ (d) $d^3/36$

73. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I

A. Moment and shear coefficients

B. Fire resistance

C. Sliding

D. Span to depth ratio of beam

List-II

1. Durability

2. Stability

3. Analysis of structure

4. Deflection limits

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

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

74. If E, G and K denote Young's modulus, modulus of rigidity and Bulk Modulus, respectively, for an elastic material, then which one of the following can be possible true for certain value of Poisson's ratio?

(a) G = 2K (b) G = E (c) K = E (d) G = K = E

75. The hydraulic mean depth for a pipe running full of water is equal to
    (a) d/2 (b) d/4 (c) 2d (d) 2πd

76. In a green sand moulding process, uniform ramming leads to
    (a) Less chance of gas porosity
    (b) Uniform flow of molten metal into the mould cavity
    (c) Greater dimensional stability of the casting
    (d) Less sand expansion type of casting defects

77. What is parallel axis theorem and to whom it is applied?
    (a) Theorem used to add the two mutually perpendicular moment of inertias for areas
    (b) Theorem used to add the two mutually perpendicular moment of inertias for volumes
    (c) Theorem used to add the two mutually perpendicular moment of inertias for linear distances
    (d) Theorem used to add the two mutually perpendicular moment of inertias for vectors

78. A real practical fluid possesses which of the following?
    (a) Viscosity (b) Surface tension
    (c) Density (d) All of these

79. At what stress does the first flexural crack appear in RRC beams made of M25 grade concrete?
    (a) 3.0 MPa (b) 3.5 MPa (c) 4.0 MPa (d) 4.5 MPa

80. Consider the following statements:
    If at a section distant from one of the ends of the beam, M represents the bending moment V the shear force and w the intensity of loading, then
    1. dM/dx = V
    2. dV.dx = w
    3. dw/dx = y
    (the deflection of the beam at the section)
    Which of these statements are correct?
    (a) 1 and 3 (b) 1 and 2 (c) 2 and 3 (d) 1, 2 and 3

81. If the non-Uniform loading is of the type of parabola then for calculating the moment of inertia for areas?
    (a) The net load will not be formed as all the forces will be cancelled
    (b) The net force will act the centre of the parabola
    (c) The net force will act on the base of the loading horizontally
    (d) The net force will act at the centroid of the parabola

82. The viscosity of liquid _____ with increase in temperature.
    (a) decreases (b) increases
    (c) Both (a) and (b) (d) None of these

83. Which of the following scales is the largest one?
    (a) 1 cm = 50 m (b) 1 : 42000
    (c) RF = $\frac{1}{300000}$ (d) 1 cm = 50 km

84. In solidification of metal during casting, compensation for solid contraction is
    (a) Provided by the oversize pattern
    (b) Achieved by proper placed risers
    (c) Obtained by promoting directional solidification
    (d) Made by provision of chills

85. In the calculation of the radius of gyration, we use intensity of loadings. So whenever the distributed loading acts perpendicular to an area its intensity varies _____
    (a) Linearly (b) Non-Linearly
    (c) Parabolically (d) Cubically

86. Measurements taken with a wrong scale can be corrected by using the relation
    (a) True length = $\frac{\text{Correct scale}}{\text{Wrong scale}} \times$ measured length
    (b) True length = $\left(\frac{\text{Correct scale}}{\text{Wrong scale}}\right)^2 \times$ measured length
    (c) True length = $\left(\frac{\text{Correct scale}}{\text{Wrong scale}}\right)^3 \times$ measured length
    (d) None of these

87. _____ is a phenomenon by which a liquid rises into a thin glass tube above or below its general level.
    (a) Surface tension (b) Capillarity
    (c) Cohesion (d) Adhesion

88. The bending moment (M) is constant over a length segment l(I) of a beam the shearing force will also be constant over this length and is given by
    (a) M/I (b) M/2I (c) M/4I (d) None of the above

89. The primary purpose of sprue in a casting mould is to
    (a) Feed the casting at a rate consistent with the rate of solidification
    (b) Act as a reservoir for molten metal
    (c) Feed molten metal from the pouring basin to the gate
    (d) Help food the casting until all solidification takes place

90. The metacentric height of battle ships is
    (a) 0.3 m to 0.8 m (b) 1.0 m to 1.5 m
    (c) 2.5 m to 3.5 m (d) 5.0 m to 6.0 m

91. The lines used to create the auxiliary view should appear as _____ in the finished view.
    (a) Object lines (b) Construction lines
    (c) Reference lines (d) Construction lines

92. A lien joining some fixed points on the main survey lines is known as
    (a) Base line (b) Check line
    (c) Contour line (d) Tie line

93. In which of the following are metal moulds used:
    (a) Green sand mould (b) Dry sand mould
    (c) Die casting process (d) Loam moulding

94. In order to avoid separation in venturimeter the angle of divergence is kept
    (a) 10° to 15° (b) 15° to 20°
    (c) 5° to 7° (d) 7° to 10°

95. A beam cross-section is used in two different orientations as shown in the figure given below:

Bending moments applied to the beam in both cases are same. The maximum bending stresses induced in cases (A) and (B) are related as
    (a) σA = σB (b) σA = 2σB
    (c) σA = $\frac{\sigma_B}{2}$ (d) σA = $\frac{\sigma_B}{4}$

96. Length of line measured with a 20 m chain was found to be 634.4m, if the chain was 5 cm too long, throughout the measurement, then the true length of the line is:
(a) 646.990 m   (b) 635.986 m
(c) 638.818 m   (d) 632.814 m

97. An expendable pattern is used in
(a) Slush casting   (b) Squeeze casting
(c) Centrifugal casting   (d) Investment casting

98. The principle reason for using an auxiliary view is _____.
(a) to eliminate hidden lines
(b) to create a true projection plane from an inclined plane in one of the primary views
(c) to show cylinders as ellipses
(d) to locate center marks

99. The head loss due to turbulence flow as compared to laminar flow is
(a) less   (b) more   (c) equal   (d) unpredictable

100. The area of a plot to be surveyed is about 1200.0 km^2, the most suitable method is
(a) compass   (b) tacheometric
(c) geodetic   (d) plane table

101. The electrode used in arc welding are coated electrodes. The coating is not expected to
(a) Provide protective atmosphere to weld
(b) Stabilise the arc
(c) Add alloying elements
(d) Prevent electrode from contamination

102. This type of surface is tipped to all principal planes of projection and does not appear true size in any standard view:
(a) Foreshortened   (b) Parallel
(c) Orthographic   (d) Oblique

103. Consider the following statements:
1. Piezometer is used to measure small variation of pressure above ambient pressure.
2. Thixotropic fluid exhibits decrease in viscosity with time.
Which of the above statements is/are correct?
(a) Only 1   (b) Only 2
(c) Both 1 and 2   (d) Neither 1 nor 2

104. The required slope correction for a length of 60 m along a gradient of 1 in 20 is
(a) 0.75 cm   (b) 5.5 cm   (c) 7.5 cm   (d) 75cm

105. Consider the following statements:
The size of heat affected zone (HAZ) will increase with
1. Increased starting temperature
2. decreased welding speed
3. decreased thermal conductivity of base metal
4. Increase in base metal thickness
Which of the statements given above are correct?
(a) 1, 2 and 4   (b) 1, 2 and 3   (c) 1 and 3   (d) 2 and 3

106. In the case of beams with circular cross-section, what is the ratio of the maximum shear stress to average shear stress?
(a) 3 : 1   (b) 2 : 1   (c) 3 : 2   (d) 4 : 3

107. Match List I with List II and select the correct answer using the codes given below the lists.

List I	List II
A. Lubrication	1. Capillary
B. Rise of sap in trees	2. Vapour pressure
C. Formation of droplets	3. Viscosity
D. Cavitation	4. Surface tension

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

108. Cumulative errors that occur in chaining are proportional to
(a) L   (b) 1/L   (c) $\sqrt{L}$ (d) $1\sqrt{L}$

109. Match list I (welding problems) with list II (causes) and select the correct answer using the codes given below the lists:
List I (Welding problems)
A. Cracking of weld metal
B. Cracking of base metal
C. Porosity
D. Inclusion
List II (Causes)
1. Excessive stress
2. High joint rigidity
3. Failure to remove slag from previous deposit
4. Oxidation
5. Excessive H_2, O_2 and N_2 in the welding atmosphere
(a) A-2, B-1, C-5, D-3   (b) A-3, B-4, C-2, D-1
(c) A-2, B-4, C-5, D-3   (d) A-3, B-1, C-4, D-2

110. Two pumps can operate independently at heads H_1, H_2 and discharges Q_1, Q_2, respectively. If the pumps are connected in parallel, then what are the resulting discharge (Q) and head (H)?
(a) Q = Q_1 + Q_2, H = H1 + H2
(b) Q = Q_1 − Q_2, H = H1 − H2
(c) Q = Q_1 = Q_2, H = H1 = H2
(d) Q = Q_1 + Q_2, H = H1 = H2

111. This is the plane upon which the top view is projected:
(a) Horizontal   (b) Frontal
(c) Profile   (d) Base

112. In arc welding process, the voltage and current are 25 V and 300 A respectively. The arc heat transfer efficiency is 0.85 and welding speed is 8 mm/s. The net heat input (in J/mm) is
(a) 62   (b) 797   (c) 1103   (d) 79700

113. If s is the sum of the three angles of a spherical triangle, the spherical excess equals
(a) s-90°   (b) s-180°   (c) 180°-s   (d) 270°-s

114. What is the unit of dynamic viscosity of a fluid termed 'poise' equivalent to?
(a) dyne/cm^2 (b) gs/cm
(c) dyne s/cm^2 (d) g-cm/s

115. If E = elasticity modulus, I = moment of inertia about the neutral axis and M = bending moment in pure bending under the symmetric loading of a beam, the radius of curvature of the beam:
1. Increase with E   2. Increases with M
3. Decreases with I   4. Decreases with M
Which of these are correct?
(a) 1 and 3   (b) 23 and 3   (c) 3 and 4   (d) 1 and 4

116. If a solid is positioned that its axis is perpendicular to one of the reference plane. Which of the following is false?
(a) Axis is parallel to other reference plane
(b) Base is parallel to reference plane
(c) Projection on that plane gives true shape of its base
(d) Base is perpendicular to reference plane

117. The fore bearings of the sides of a triangle are 30°, 150° and 270° respectively. The triangle is
(a) a right-angled
(b) an equilateral
(c) an isosceles
(d) an obtuse angled

118. Match List I with List II and select the correct answer using the codes given below the lists.
List I (Variable)
A. Dynamic viscosity
B. Moment of momentum
C. Power
D. Volume modulus of elasticity
List II (Dimensional expression)
1. $[ML^2T^{-3}]$
2. $[ML^{-1}T^{-2}]$
3. $[ML^{-1}T^{-1}]$
4. $[ML^2T^{-2}]$
5. $[ML^2T^{-1}]$
(a) A-1, B-4, C-2, D-3
(b) A-3, B-5, C-1, D-2
(c) A-1, B-5, C-2, D-3
(d) A-3, B-4, C-1, D-2

119. Which one of the following welding processes consists of minimum heat affected zone [HAZ]
(a) Shielded metal arc welding
(b) Laser beam welding
(c) Ultrasonic welding
(d) Metal inert gas welding

120. Which one of the following is the correct statement? Streamline, path line and streak line are identical when the
(a) flow is steady
(b) flow is uniform
(c) flow velocities do not change steadily with time
(d) flow is neither steady nor uniform

121. When the axis of solid is parallel to H.P &V.P, then _____view should be drawn first and ____ and _____view then projected from it.
(a) front , top, side
(b) top, side, front
(c) side, front, top
(d) top, front, side

122. In the design of two-way slab restrained at all edges, torsional reinforcement required is
(a) 0.75 times the area of steel provided at mid-span in the same direction
(b) 0.375 times the area of steel provided at mid-span in the same direction
(c) 0.375 times the area of steel provided in the shorter span
(d) nil

123. Match List I with List II and select the correct answer using the codes given below the lists.
List I (Condition)
A. Existence of stream function
B. Existence of velocity potential
C. Absence of temporal variations
D. Constant velocity vector
List II (Regulating Fact)
1. Irrotationality of flow
2. Continuity of flow
3. Uniform flow
4. Steady flow
(a) A-4, B-3, C-2, D-1
(b) A-2, B-1, C-4, D-3
(c) A-4, B-1, C-2, D-3
(d) A-2, B-3, C-4, D-1

124. In case of simply supported beam, the clear distance between lateral restraints shall not exceed

(a) 60b or $250\frac{b^2}{d}$
(b) 60b or $\frac{100b^2}{d}$
(c) 25b or $250\frac{b^2}{d}$
(d) 25b or $100\frac{b^2}{d}$

125. While transmitting the same power by a shaft, if its speed is doubled, what should be its new diameter if the maximum shear stress induced in the shaft remains same?
(a) $\frac{1}{2}$ of the original diameter
(b) $\frac{1}{\sqrt{2}}$ of the original diameter
(c) $\sqrt{2}$ of the original diameter
(d) $\frac{1}{(2)^{1/3}}$ of the original diameter

126. The velocity of a water stream is being measured by a L-shaped pitot-tube and the reading is 20 cm. Then, what is the approximate value of velocity?
(a) 196 m/s
(b) 2 m/s
(c) 98 m/s
(d) 20 m/s

127. A reinforced concrete member is subjected to combined action of compressive axial force and bending moment. If ε_c is the least compressive strain in the member, f_y, the yield stress of steel and, E_s, the modulus of elasticity of steel, the maximum permissible compressive strain in concrete member will be
(a) 0.002
(b) $0.002 + f_y/(1.15Es)$
(c) $0.0035 – 0.75\varepsilon_c$
(d) 0.0035

128. Consider the following statements regarding a path line in fluid flow
1. A path line is a line traced by a single particle over a time interval.
2. A path line shows the positions of the same particle at successive time instants.
3. A path line shows the instantaneous positions of a number of particles, passing through a common point, at some previous time instants.
Which of the statements given above are correct?
(a) 1 and 3
(b) 1 and 2
(c) 2 and 3
(d) 1, 2 and 3

129. The magnetic bearing of a line is S38°30'W and magnetic declination is 4°30'W. Calculate the true bearing.
(a) S 43° W
(b) S 34° W
(c) S 47° W
(d) S 56° W

130. Beam sections designed in accordance with LSM as compared to sections designed in accordance with WSM will have
(a) larger depth and smaller amount of reinforcement
(b) same depth and same reinforcement
(c) smaller depth and more reinforcement
(d) same depth as that of a deep beam

131. When a plane surface is inclined to any plane of projection, the view of the plane surface projected on it will be its _____
(a) point shape
(b) true shape
(c) straight line
(d) apparent shape

132. If the Back bearing of a line is 36°15' its Fore bearing will be
(a) 36°15'
(b) 126°15'
(c) 143°45'
(d) 216°15'

133. The pressure drop for a relatively low Reynolds number flow in a 600 mm, 30 m long pipeline is 70 kPa. What is the wall shear stress?
(a) 0
(b) 350 Pa
(c) 700 Pa
(d) 1400 Pa

134. When a plane is perpendicular to a reference plane, its projection on that plane is a_____
(a) straight line (b) true line
(c) apparent line (d) point

135. Which one of the following statements about the percentage of tensile steel required to produce a balanced reinforced concrete section is correct?
The required percentage of steel
(a) Reduces as the yield strength of steel increase
(b) Remains unchanged irrespective of the yield strength of steel
(c) Is the same for a given quality of steel irrespective of whether working stress method is followed or ultimate load method is used
(d) Is only a function of the modulus of elasticity of steel.

136. The free-body diagram of a satellite rotating about the earth will show the satellite isolated from its surroundings and
(a) no force acting on it
(b) its velocity shown on it
(c) the force of gravity and centrifugal force acting on it
(d) only the force of gravity acting on it

137. An oil of specific gravity 0.9 has viscosity of 0.28 stoke at 38°C. What will be its viscosity in N-s/m²?
(a) 0.2520 (b) 0.0311 (c) 0.0252 (d) 0.0206

138. A closed compass traverse PQRS is run with a prismatic compass in a clock wise direction

Line	Fore bearing
PQ	50°
QR	170°
RS	230°
SP	310°

The value of the included angle S is
(a) 360° (b) -260° (c) 100° (d) 50°

139. Flexural collapse in over-reinforced beam is due to
(a) Compression failure (b) Tension failure
(c) Yielding of steel (d) None of these

140. A centrifugal pump needs 1000 W of power when operating at 1500 rpm. What is the power requirement if, the speed of the pump is increased to 3000 rpm?
(a) 2000 W (b) 4000 W (c) 6500 W (d) 8000 W

141. When the prism is placed vertically on one of its end faces, the end face on which the prism rests is called the_____ and the vertical side faces are the_____ faces.
(a) bottom, lateral (b) base, lateral
(c) base, longitudinal (d) horizontal, lateral

142. The process of turning the telescope of a theodolite over its supporting axis through 180° in a vertical plane is called:
(a) plunging (b) reversing
(c) transiting (d) any one of the above

143. A deep continuous beam has effective depth of 500 mm and effective cover of 50 mm. Its maximum effective length is
(a) 1375 mm
(b) 1100 mm
(c) 1275 mm
(d) Cannot be determined from the given data

144. The velocity component after striking the surface will be_____
(a) One
(b) Zero
(c) Infinity
(d) Negative

145. An implication of Newton's law is that
(a) the total momentum (linear + angular) of the body is conserved
(b) the linear and angular momentum of the body are conserved separately
(c) only the linear momentum of the body is conserved
(d) a rigid body will tend to rotate if a force is applied at a point other than the centre of mass of the body

146. Auxiliary planes are of _____types.
(a) two (b) one (c) three (d) six

147. A beam of rectangular cross-section (b × d) is subjected to a torque T. What is the maximum torsional stress induced in the beam (b < d and α is a constant)?
(a) $\frac{T}{\alpha b^2 d}$ (b) $\frac{T}{\alpha bd^2}$ (c) $\frac{T}{\alpha bd}$ (d) $\frac{T}{bd}$

148. For measuring a horizontal angle between two lines with better accuracy than that given by the vernier, the method commonly used is
(a) Reiteration (b) Repetition
(c) Double centering (d) Double sighting

149. Which among the following is formula for force when it acts along the direction of flow?
(a) $\rho a v^2 Sin^2\theta$ (b) $\rho a v\, Sin^2\theta$
(c) $\rho a\, Sin^2\theta$ (d) $maE\, Sin^2\theta$

150. Minimum shear reinforcement in beams is provided in the form of stirrups
(a) to resist extra shear force due to live load
(b) to resist the effect of shrinkage of concrete
(c) to resist principal tension
(d) to resist shear cracks at the bottom of beam

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

AP GRAMA/WARD SACHIVALAYAM GRAND TEST –3ANSWER KEY
GROUP A

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