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AP GRAMA/WARD SACHIVALAYAM GRAND TEST – 1
CAT - 2 A

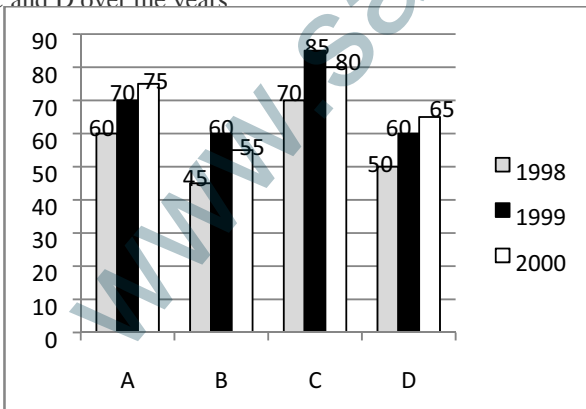
MARKS : 150No. of Questions: 150

Time : 150 Minutes

(-)ive marks: 0.25

- The costs of two watches were in the ratio 16 : 23. The cost of first watch increases by 10% and that of second by Rs. 477. Now the costs of two watches are in the ratio 11 : 20. The price of the second watch (in Ts.) in the beginning was
 (a) 932 (b) 1219 (c) 1696 (d) 848
- Amit had a certain amount with him. He spent 20% of that to buy a car and 5% of the remaining on maintenance of a bike. Then he gifted 120 Rs. If he is left with Rs. 1400. Then find the total amount?
 (a) Rs. 2000 (b) Rs. 21000
 (c) Rs. 18000 (d) Rs. 15000
- Tap 'A' can fill a tank in 10 hours. Due to leak it emptied in 15 hours. In how many hours leak alone can empty the half tank?
 (a) 30 hours (b) 6 hours (c) 15 hours (d) 20 hours
- A journey of 800 km is done in a total of 10 hours, If 320 km is travel by train and remaining by bus. The same journey is done in 8 hours if 240 km is travel by train and remaining is done by bus. Find the ratio of the speed of train to bus.
 (a) 2:11 (b) 3:11 (c) 1:11 (d) 4:11
- A sum of money invested for 7 years in Scheme 1 which offers SI at a rate of 8% pa. The amount received from Scheme 1 after 7 years invested for 2 years in Scheme 2 which offers CI rate of 10% pa. If the interest received from Scheme B was Rs.1638. What was the sum invested in Scheme 1 ?(approx)
 (a) Rs.7500 (b) Rs.5000
 (c) Rs.8200 (d) Rs.9000

Directions (6-8): Study following Bar graph carefully and answer the question given below The graph represents the production of Wheat in thousand tonnes) in four States A, B, C and D over the years



- The difference (in thousand tones) between the average production of wheat by four states in 1999 and average production by them state in 1998 is:
 (a) 12.5 (b) 13.5 (c) 17 (d) 21.5
- Which of the given state has recorded the maximum percentage growth in production of wheat from 1999 to 2000?
 (a) A (b) A and B (c) D (d) None of these

- Which of the four states has recorded the maximum percentage growth in production of wheat from 1998 to 1999?
 (a) A (b) D (c) A and D both (d) None of these
- In a certain code language, "CONGO" is written as "RZPRD" and "TREAT" is written as "UQGWX". How is "PHONE" written in that code language?
 (a) JNQIJ (b) KMQHK
 (c) MKQKH (d) LLPIL
- Vineet travels 16 km towards west, turns right and travels another 12 km, and then takes two successive left turns covering 8 km and 12 km in each turn respectively. Finally, he takes a right turn and travels 10km further. How far is he now from his original position?
 (a) 46 km (b) 34 km (c) 40 km (d) 38 km
- In the following question below are given some statements followed by some conclusions. Taking the given statements to be true even if they seem to be at variance from commonly known facts, read all the conclusions and then decide which of the given conclusion logically follows the given statements.

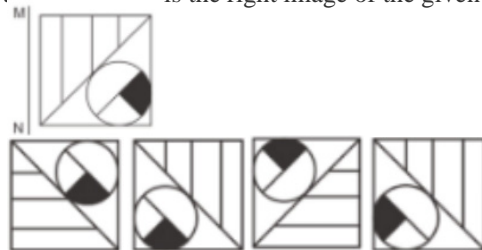
Statements: Some pens are pencils.

All pencils are erasers.

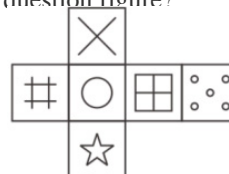
Conclusions: I. Some pencils are not pens.

II. Some erasers are not pens.

- Only conclusion (I) follows.
 - Only conclusion (II) follows.
 - Neither conclusion (I) nor conclusion (II) follows.
 - Both conclusions follow.
- If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?



- Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?



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

Direction (Q. No. 14-16) : In each of the following questions a sentence consists of a blank 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. I am _____ my book
(a) look for (b) look about
(c) looking for (d) look on
15. As the pilgrims were hungry, they ate _____
(a) instantly (b) speedily
(c) greedily (d) frequently
16. Can you tell me who were the first persons to _____ the Everest?
(a) Climbed (b) Win
(c) Victory (d) Scale
17. Famous writer Krishna Sobti died recently. She has won which of the following awards in her life span?
A. Jnanpith Award
B. Sahitya Akademi Award
C. Vyas Samman
D. Padma Bhushan
(a) A and C (b) B and C
(c) A, C and D (d) A and B
18. Which country will host the annual G20 leaders' summit on 21-22 November 2020?
(a) UAE (b) Syria (c) Qatar (d) Saudi Arabia
19. Who took over as Prime Minister of Britain in July 2019?
(a) Michael Gove (b) Boris Johnson
(c) Nigel Farage (d) Rory Stewart
20. Who is the author of the book titled 'New age technology and Industrial Revolution 4.0'?
(a) Raushan Ganduly (b) Manoj Jha
(c) Suresh Gopi (d) Narendra Jadhav
21. Which among the following is the newest high court in India?
(a) Chhattisgarh High Court
(b) Andhra Pradesh High Court
(c) Jharkhand High Court (d) Manipur High Court
22. What is the toll free number of Spandhana?
(a) 1800-425-4440 (b) 1800-524-3330
(c) 1800-524-2220 (d) 1800-625-5550
23. On which date farmer day was celebrated in Andhra Pradesh?
(a) July 8th (b) June 8th (c) Aug 8th (d) May 8th
24. Rajanna Badi bata started from which date to date?
(a) July 14th to 17th (b) June 14th to 17th
(c) Aug 14th to 17th (d) Sep 14th to 17th
25. What is the scheme name of Mid Day meals program in Government school?
(a) Y. S. R. Akshaya Patra (b) Rajanna Canteen
(c) N.T. R Canteen (d) None of the above
26. How much financial assistant provided to the farmer on the name of Y.S. R. Rythu Barosa
(a) 14500 (b) 13500 (c) 6000 (d) 12500
27. In which country more magnetic reserves are located
(a) Australia (b) Turkey (c) North Sweden
(d) China
28. Integrated Circuits are manufactured with
(a) Silver (b) Silicon (c) Iron (d) Nickel
29. Fourth state of matter is called as

- (a) Solid (b) Liquid (c) gases (d) Plasma
30. Dinosaurs were
(a) Cenozoic reptiles (b) Mesozoic birds
(c) Paleozoic amphibians (d) Mesozoic reptiles
31. The Raichur Doab is formed by the Confluence of Rivers
(a) Krishna and Tungabhadra
(b) Tunga and Bhadra
(c) Krishna and Godavari
(d) Kagna and Krishna
32. Which of the following places is an evidence of Chalcolithic age in Andhra
(a) Sanganakallu (b) Tekkala Kota
(c) Palavoy (d) Patapadu
33. Which literature refers to Andhras as 'Andhakaratta'
(a) Vedic literature (b) Buddhist literature
(c) Jain literature (d) Taitareya brahmana
34. Who among the following located Satavahanas in Ballari (Bellary) district on the basis of Myakadoni Inscription
(a) V.V. Mirashi (b) R.G. Bhandarker
(c) V.S Sukthankar (d) S.A. Joglekar
35. Name the capital of a place known as "Anupa" under Goutami Putra Satakarni?
(a) Mahishmati (b) Vidisha
(c) Ujjain (d) Podana
36. The following expenditure shall be charged on the consolidated fund of India, except
(a) Debt charges for which the government of India is liable
(b) Salaries, allowances and pensions payable to or in respect of Supreme Court judges
(c) The pensions payable to or in respect of judges of any high court
(d) The pensions payable to or in respect of governors of any state
37. All following statements regarding the privileges of Parliament members are correct except
(a) Freedom from arrest
(b) Freedom of attendance as witness
(c) Freedom of speech
(d) Members individual freedom only allowed, house as a whole do not have freedom
38. Article 17 and 18 provide
(a) Social equality (b) Economic Equality
(c) Political Equality (d) Religious Equality
39. Prices in India increase mainly not because of
(a) Indiscriminate increase in public expectations
(b) Hoarding of essential commodities
(c) Oil price shocks
(d) Less agricultural production
40. The control inflation
(a) it may be sufficient to use monetary policy

- (b) fiscal policy measures would alone be sufficient
- (c) inflation should be targeted aggressively
- (d) a combination of monetary, fiscal and exchange rate policies may be required

41. The expert committee to review and strengthen the monetary policy framework, in recent times was headed by

- (a) N. Vaghul
- (b) SS Tarapore
- (c) Urjit Patel
- (d) Aravind Panagaria

42. The Banking Regulation Act 1949 gave extensive regulatory powers to

- (a) State Bank of India
- (b) Government of India
- (c) Reserve Bank of India
- (d) All Nationalized Banks

43. An example of all India Development Finance institutions is

- (a) Small Industries Development Bank of India (SIDBI)
- (b) EXIM Bank
- (c) UTI
- (d) Export credit and guarantee corporation of India (ECGCI)

44. Which of the following statements is true?

- (a) As on 2013-14, Direct taxes accounted for less than half of the total tax revenue of the Central Government
- (b) Of all the taxes levied by the centre, corporate tax is the most important one in terms of revenue generation
- (c) Income tax has played a crucial and positive role in income redistribution in rural India
- (d) GST is not related to income

45. Match the following List I with List II (Northern hemisphere) and choose the correct answer.

List I

- a. Winter solstice
- b. Summer solstice
- c. Vernal equinox
- d. Autumnal equinox

List II

- I. December, 22
- II. June, 21
- III. March, 21
- IV. September, 23

Codes:

- | | | | |
|----------|----------|----------|----------|
| a | b | c | d |
| (a) IV | III | II | I |
| (b) I | II | III | IV |
| (c) I | II | IV | III |
| (d) IV | II | III | I |

46. Which of the following statement's rightly explain/s about tropopause?

- i) Seasonal variation occurs in the height of tropopause ?
- ii) It is the transition zone between troposphere and stratosphere.
- iii) It lies below the stratosphere

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

47. The Suez Canal connects

- (a) Baltic Sea and Pacific Ocean
- (b) Mediterranean Sea and Atlantic Ocean
- (c) Baltic Sea and Mediterranean Sea
- (d) Mediterranean Sea and Red Sea

48. Match the following:

List I (Crops)

- A. Barley
- B. Groundnut
- C. Ragi
- D. Rice

List II (Chief Producer)

- I. Karnataka
- II. Uttar Pradesh
- III. Gujarat
- IV. West Bengal

Code:

- | | | | |
|----------|----------|----------|----------|
| A | B | C | D |
| (a) I | II | III | IV |
| (b) II | III | I | IV |
| (c) IV | III | II | I |
| (d) III | IV | II | I |

49. How many mandals have been alienated from Telangana and annexed to Andhra Pradesh during reorganization due to their submergence issues under the Polavaram Project?

- (a) 5
- (b) 6
- (c) 7
- (d) 9

50. After reorganization, what is the position of Andhra Pradesh in terms of meting targets laid down under FRBM?

- (a) The targets are under control
- (b) The targets could not be met
- (c) The targets are lowered
- (d) Correct data is not available

51. The algebraic sum of the resolved parts of a number of forces in a given direction is equal to the resolved part of their resultant in the same direction. This is known as

- (a) Principle of independence of forces
- (b) Principle of resolution of forces
- (c) Principle of transmissibility of forces
- (d) None of these

52. The ductility of a material with the increase in percentage reduction in area of a specimen under tensile test.

- (a) Increases
- (b) Decreases
- (c) Remains same
- (d) None of these

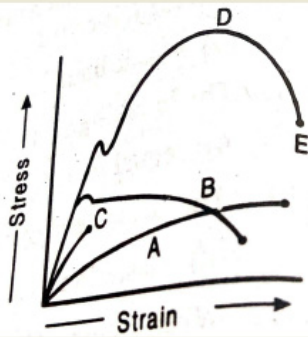
53. The liquid used in manometers should have

- (a) Low density
- (b) High Density
- (c) Low surface tension
- (d) High surface tension

54. Which of the following pump is successfully used for lifting water from deep wells?

- (a) Centrifugal pump
- (b) reciprocating pump
- (c) Jet pump
- (d) Air lift pump

55. In a stress-strain diagram as shown in Figure the curve A represents



- (a) Mild steel (b) Soft brass
(c) Low carbon steel (d) Cold rolled steel

56. The resultant of two equal forces P making an angle θ , is given by
(a) $2P \sin \theta / 2$ (b) $2P \cos \theta / 2$
(c) $2P \tan \theta / 2$ (d) $2P \cot \theta / 2$
57. A differential manometer is used to measure
(a) Atmospheric pressure
(b) Pressure in pipes and channels
(c) Pressure in venturimeter
(d) Difference of pressures between two points in a pipe
58. The self-weight of the footing, is
(a) Not considered for calculating the upward pressure on footing
(b) Also considered for calculating the upward pressure on footing
(c) Not considered for calculating the area of the footing
(d) Both (b) and (c)
59. As per IS 456 – 2000, the Creep coefficient of concrete at 28 days age of loading is _____
(a) 1.1 (b) 1.6 (c) 1.4 (d) 2.2
60. Moment of resistance for a under-reinforced beam section is
(a) $M_r = \sigma_{st} A_{st} \left(d - \frac{n}{3} \right)$ (b) $M_r = \sigma_{st} A_{st} \left(d + \frac{n}{3} \right)$
(c) $M_r = bn \frac{\sigma_{cb}}{2} \left(d - \frac{n}{3} \right)$ (d) $M_r = bn \frac{\sigma_{st}}{2} \left(d - \frac{n}{3} \right)$
61. A T-beam roof section has the following particulars:
Thickness of slab = 100 mm
Width of rib = 300 mm
Depth of beam = 500 mm
C/c distance of beams = 3.0 m
Effective span of beam = 6.0 m
Distance between points of contraflexure is 3.6m.
The effective width of flange of the beam is
(a) 1600 mm (b) 1900 mm
(c) 1500 mm (d) 3000 mm
62. Which of the following is a proper sequence?
(a) Proportional limit, elastic limit, yielding, failure
(b) Elastic limit, proportional limit, yielding, failure
(c) Yielding, proportional limit, elastic limit, failure
(d) None of the above
63. The resultant of the two forces P and Q is doubled, the new resultant is perpendicular to P . Then
(a) $P = Q$ (b) $Q = R$
(c) $Q = 2R$ (d) None of these

64. The centre of pressure for a vertically immersed surface lies at a distance equal to the centre of gravity.

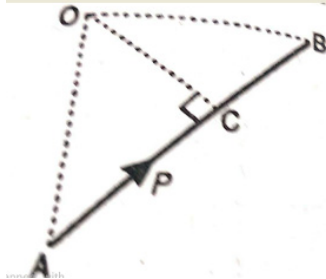
- (a) $\frac{I_G}{Ax}$ below (b) $\frac{I_G}{Ax}$ above
(c) $\frac{Ax}{I_G}$ below (d) $\frac{Ax}{I_G}$ above

65. A quicker method to find the weight of bar of circular section is given by _____ in kg/m [ϕ = diameter of bar in mm]
(a) $\frac{\phi^2}{100}$ (b) $\frac{\phi}{200}$ (c) $\frac{\phi^2}{163}$ (d) $\frac{\phi}{150}$
66. Two bars of different materials and same size are subjected to the same tensile force. If the bars have unit elongation in the ratio of 2 : 5, then the ratio of modulus of elasticity of the two materials will be
(a) 2 : 5 (b) 5 : 2 (c) 4 : 3 (d) 3 : 4
67. The working from whole to the part is done in surveying in order to ensure that
(a) Number of errors is minimum
(b) Plotting is done more quickly
(c) Survey work is completed more quickly
(d) Errors and mistakes of one portion do not affect the remaining portion
68. The forces, which meet at one point and their lines of action also lie on the same plane, are known as
(a) Coplaner concurrent forces
(b) Coplaner non-concurrent forces
(c) Non-coplaner concurrent forces
(d) Non-coplaner non-concurrent forces
69. When a body is placed over a liquid, it will float if
(a) Gravitational force is equal to the upthrust of the liquid
(b) Gravitational force is less than the upthrust of the liquid
(c) Gravitational force is more than the upthrust of the liquid
(d) None of the above
70. The impact of earthquake on structures depends on
(a) Stiffness of structure (b) Stiffness of soil
(c) Both (a) and (b) (d) Neither (a) nor (b)
71. A rod is enclosed centrally in a tube and the assembly is tightened by rigid washers. If the assembly is subjected to a compressive load, then
(a) Rod is under compression
(b) Tube is under compression
(c) Both rod and tube are under compression
(d) Tube is under tension and rod is under compression
72. If a 30 m length can be taped with a precision of ± 0.01 m, then the standard error in measuring 1.08 km with the same precision will be
(a) ± 0.54 m (b) ± 0.45 m
(c) ± 0.36 m (d) ± 0.06 m
73. The metacentric heights of two floating bodies A and B are 1 m and 1.5 m respectively. Select the correct statement.
(a) The bodies A and B have equal stability
(b) The body A is more stable than body B
(c) The body B is more stable than body A
(d) The bodies A and B are unstable

74. Which method is also known as Modular Ratio method?

- (a) Ultimate load method (b) Working stress method
(c) Limit state method (d) Effective load method

75. The moment of a force P about O as shown in figure is



- (a) P x OA (b) P x OB (c) P x OC (d) P x AC

76. When a bar is subjected to a change of temperature and its deformation is prevented, the stress induced in the bar is

- (a) Tensile stress (b) Compressive stress
(c) Shear stress (d) Thermal stress

77. A steel tape 20m long standardized at 55°F was used for measuring a base line. If coefficient of linear expansion of steel is 6×10^{-6} per degree F, the temperature during is 30° F correction for temperature per tape length is

- (a) + 0.003 m (b) - 0.003m
(c) - 0.0003 m (d) + 0.003 m

78. A smooth cylinder lying on its convex surface remains in Equilibrium.

- (a) Stable (b) Unstable
(c) Neutral (d) None of the above

79. When a liquid is flowing through a pipe, the velocity of the liquid is

- (a) Maximum at the centre and minimum near the Walls
(b) Minimum at the centre and maximum near the walls
(c) Zero at the centre and maximum near the walls
(d) Maximum at the centre and zero near the walls

80. The maximum tensile reinforcement in RCC beams is given by

- (a) $0.85 \frac{bd}{f_y}$ (b) $0.85 \frac{f_y}{bd}$
(c) 0.04 bD (d) 0.08 bD

81. The most accurate method for the measurement of the base line is

- (a) Chain (b) Invar tape
(c) Tacheometry (d) EDM

82. The term 'centroid' is

- (a) The same as centre of gravity
(b) The point of suspension
(c) The point of application of the resultant of all the forces tending to cause a body to rotate about a certain axis
(d) None of the above

83. A flow in which each liquid particle has a definite path, and the paths of individual particles do not cross each other, is called

- (a) Steady flow (b) Uniform flow
(c) Stream line flow (d) Turbulent flow

84. If there is a fall in the temperature of a composite body, then a member having greater coefficient of linear expansion will be subjected to compressive stress.

- (a) True (b) False
(c) Both (a) and (b) (d) None of these

85. The magnetic bearing of a line is S28° 30' W. If the magnetic declination is 7°30' W the true bearing of the line is

- (a) S 21° W (b) N 54° W
(c) S 36° E (d) S 36° W

86. A flow through an expanding tube at constant rate is called

- (a) Steady uniform flow (b) Steady non-uniform flow
(c) Unsteady uniform flow
(d) Unsteady non-uniform flow

87. The centre of gravity of an isosceles triangle with base (p) and sides (q) from its base is

- (a) $\frac{\sqrt{4p^2 - q^2}}{6}$ (b) $\frac{4p^2 - q^2}{6}$
(c) $\frac{p^2 - q^2}{4}$ (d) $\frac{p^2 + q^2}{4}$

88. Minimum percentage of tension steel in an RCC beam for 500 steel is

- (a) 0.12 (b) 0.17 (c) 0.22 (d) 0.80

89. When a bar of length l, width b and thickness t is subjected to a pull of P, its

- (a) Length, width and thickness increases
(b) Length, width and thickness decreases
(c) Length increases, width and thickness decreases
(d) Length decreases, width and thickness increases

90. The centre of gravity of a right circular solid cone is at a distance of from its base, measured along the vertical axis.

- (a) h / 2 (b) h / 3 (c) h / 4 (d) h / 6

91. A theodolite circle is divided into degrees and half degrees. If the length of 59 main scale divisions is taken as length of vernier and divided into 60 parts the least count of vernier, in seconds is

- (a) 10 (b) 20 (c) 30 (d) 40

92. The length of the divergent cone in a venturimeter is That of the convergent cone.

- (a) Equal to (b) Double
(c) Three to four times (d) Five to six times

93. If the modulus of elasticity for a given material is twice its modulus of rigidity, then bulk modulus is equal to

- (a) 2 C (b) 3 C (c) $\frac{2C}{3}$ (d) $3\frac{C}{2}$

94. 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) $\frac{2}{3} Ml$ (b) $\frac{1}{3} Ml^2$ (c) $\frac{3}{4} Ml^2$ (d) $\frac{4}{3} Ml^2$

95. Upward deflection in any structure should be

- (a) $\neq \frac{\text{span}}{100}$ (b) $\neq \frac{\text{span}}{150}$
(c) $\neq \frac{\text{span}}{300}$ (d) None of the above

96. In order to avoid tendency of separation at throat in a venturimeter, the ratio of the diameter at throat to the diameter of pipe should be

- (a) $\frac{1}{16}$ to $\frac{1}{8}$ (b) $\frac{1}{8}$ to $\frac{1}{4}$
(c) $\frac{1}{4}$ to $\frac{1}{3}$ (d) $\frac{1}{3}$ to $\frac{1}{2}$

- (a) Equal to (b) Less than
(c) Directly proportional to
(d) Inversely proportional to
98. The latitude of a line is + 200 and departure is – 200 m. The reduced bearing of the line is
(a) N 45° E (b) N 45° W
(c) S 45° E (d) S 45° W
99. The hot working of metals is carried out
(a) At the recrystallisation temperature
(b) Below the recrystallisation temperature
(c) Above the recrystallisation temperature
(d) At any temperature
100. The loss of head at exit of a pipe is
(a) $\frac{v^2}{2g}$ (b) $\frac{0.5v^2}{2g}$ (c) $\frac{0.375v^2}{2g}$ (d) $\frac{0.75v^2}{2g}$
101. The shear force of a cantilever beam of length l carrying a uniformly distributed load of w per unit length is at the free end.
(a) Zero (b) $wl / 4$ (c) $wl / 2$ (d) wl
102. Spherical aberration is eliminated by using
(a) Two lenses (b) Ramsdon eye piece
(c) Convex lenses (d) Concave lenses
103. The increase in hardness due to cold working, is called
(a) Age-hardening (b) Work-hardening
(c) Inducing hardening (d) Flame hardening
104. The total energy line lies over the centre line of the pipe by an amount equal to
(a) Pressure head (b) Velocity head
(c) Pressure head + velocity head
(d) Pressure head – velocity head
105. An Ogee curve is a _____
(a) Semi ellipse
(b) Continuous double curve with convex and concave
(c) Freehand curve which connects two parallel lines
(d) Semi hyperbola
106. Deep beams are designed for
(a) Shear force only (b) Bending moment only
(c) Both shear force and bending moment
(d) Bearing
107. When a pattern is made in three parts, the top part, is known as a
(a) Drag (b) Cheek (c) Cope (d) none of these
108. The force exerted (in newton) by a jet of water impinging normally on a fixed plate is
(a) $\frac{waV}{2g}$ (b) $\frac{waV}{g}$ (c) $\frac{waV^2}{2g}$ (d) $\frac{waV^2}{g}$
Where w = Specific weight of water in N/m^3 ,
 a = Cross-sectional area of jet in m^2 , and
 V = Velocity of jet in m/s .
109. How many pairs of parallel lines are there in regular Hexagon?
(a) 2 (b) 3 (c) 6 (d) 1
110. Swab is used for
(a) Smoothing and cleaning out depressions in the mould
(b) Cleaning the moulding sand
(c) Moistening the sand around the edge before removing pattern
(d) Reinforcement of sand in the top part of the moulding box

111. The R.L. of the point A which is on the floor is 100 m and Back sight reading on A is 2.455 m. If the FS reading on the point B which is on the ceiling is 2.745 m. The R.L. of the point B will be
(a) 94.8 m (b) 99.71 m
(c) 105.2 m (d) 100.29 m
112. Given are the steps to construct regular polygon of any number of sides.
Arrange the steps.
i. Draw the perpendicular bisector of AB to cut the line AP in 4 and the arc AP in 6
ii. The midpoint of 4 and 6 gives 5 and extension of that line along the equidistant points 7, 8, etc. gives the centers for different polygons with that number of sides and the radius is AN (N is from 4, 5, 6, 7, so on to N)
iii. Join A and P. with center B and radius AB, draw the quadrant AP
iv. Draw a line AB of given length. At B, draw a line BP perpendicular and equal to AB
(a) i, iv, ii, iii (b) iii, ii, iv, i
(c) iv, iii, i, ii (d) ii, iii, iv, i
113. The ratio of the normal force of jet of water on a plate inclined at an angle of 30° as compared to the when the plate is normal to jet, is
(a) $1/\sqrt{2}$ (b) $1/2$ (c) 1 (d) $\sqrt{2}$
114. In order to produce uniform packing of sand in the moulds, a is used
(a) Sand slinger (b) Squeezing machine
(c) Jolt machine (d) Stripper plate machine
115. A short column 20 cm x 20 cm in section is reinforced with 4 bars whose area of cross section is 20 sq. cm. If permissible compressive stresses in concrete and steel are 40 kg / cm^2 and 300 kg / cm^2 , the Safe load on the column, should not exceed
(a) 4120 kg (b) 21,200 kg
(c) 412,000 kg (d) None of these
116. The additive constant for a tacheometer is
(a) f / i (b) $f + d$ (c) $f + i$ (d) f / d
117. The maximum efficiency of jet propulsion of a ship with inlet orifices at right angles to the direction of motion of ship, is
(a) 40% (b) 50% (c) 60% (d) 80%
118. For welding plates of thickness more than 12.5 mm, its edges
(a) Do not require beveling
(b) Should be bevelled to a single-V or U-groove
(c) Should have a double-V or U-groove on both sides
(d) Should have a double-V or U-groove on both sides
119. The second step in drawing a polygon is to divide the semicircle into the number of _____ the polygon has.
(a) Vertices (b) Edges
(c) Diagonals (d) Sides
120. The welding set up is said to have straight polarity, when
(a) Work is connected to the positive terminal and the electrode holder to the negative terminal
(b) Work is connected to the negative terminal and the electrode holder to the positive terminal
(c) Work is connected to the positive terminal and the electrode holder is earthed
(d) Work is connected to the negative terminal and the electrode holder is earthed

121. The contour interval is
 (a) Directly proportional to the scale of map
 (b) Inversely proportional to scale of map
 (c) Large for flat ground
 (d) Small for hilly areas
122. Which of the following constructions doesn't use elliptical curves?
 (a) Cooling towers (b) Dams
 (c) Bridges (d) Man-holes
123. The type of tool used on lathe, shaper and planer is
 (a) Single point cutting tool
 (b) Two point cutting tool
 (c) Three point cutting tool
 (d) Multi-point cutting tool
124. Which of the following is the eccentricity for an ellipse?
 (a) 1 (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $\frac{5}{2}$
125. If the maximum bending moment of a simply supported slab is M Kg. cm, the effective depth of the slab is (where Q is M.R. factor)
 (a) $\frac{M}{100Q}$ (b) $\frac{M}{10\sqrt{Q}}$ (c) $\sqrt{\frac{M}{Q}}$ (d) $\sqrt{\frac{M}{1000Q}}$
126. The size of a lathe is specified by the
 (a) Length between centres
 (b) Swing diameter over the bed
 (c) Swing diameter over the carriage
 (d) All of these
127. Steps are given to draw an ellipse by trammel method. Arrange the steps.
 i. Place the trammel so that r is on the minor axis CD and Q on the major axis AB . Then P will be on the ellipse.
 ii. Draw two axes AB and CD intersecting each other at O .
 iii. By moving the trammel to new positions, always keeping R on CD and Q on AB , obtain other points and join those to get an ellipse.
 iv. Along the edge of a strip of paper which may be used as a trammel, mark PQ equal to half the minor axis and PR equal to half of major axis.
 (a) i, ii, iii, iv (b) ii, iv, i, iii
 (c) iii, iv, I, ii (d) iv, i, ii, iii
128. In case of turning, as the machining proceeds the spindle speed must With the decrease in diameter of work
 (a) Decrease (b) Increase
 (c) All of the above (d) None of the above
129. The impeller of a centrifugal pump may have
 (a) Volute casing (b) Volute casing with guide blades
 (c) Vortex casing (d) Any one of these
130. Steps are given to draw a normal and a tangent to the ellipse at a point Q on it. Arrange the steps.
 i. Draw a line ST through Q and perpendicular to NM
 ii. ST is the required tangent.
 iii. Join Q with the foci F_1 and F_2
 iv. Draw a line NM bisecting the angle between the lines drawn before which is normal.
 (a) i, ii, iii, iv (b) ii, iv, i, iii
 (c) iii, iv, I, ii (d) iv, i, ii, iii
131. In calculating the area of a plane by a planimeter, the area of zero circle is excluded when the
 (a) Anchor point is inside the area

- (b) Anchor point is outside the area
 (c) Tracing arm is inside the area
 (d) Tracing arm is outside the area
132. Mechanical efficiency of a centrifugal pump is the 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
133. In drilling operation, the metal is removed by
 (a) Shearing (b) Extrusion
 (c) Shearing and extrusion
 (d) Shearing and compression
134. Identify the correct statement
 (a) Contour lines close together near the top of hill
 (b) Contour lines wide apart the foot of hill
 (c) Valley contours are convex toward the stream
 (d) All the above
135. Which of the following constructions use parabolic curves?
 (a) Cooling towers (b) Water channels
 (c) Light reflectors (d) Man-holes
136. The relation between modulus of rupture f_{cr} , splitting strength f_{cs} and direct tensile strength f_{ct} is given by
 (a) $f_{cr} = f_{cs} = f_{ct}$ (b) $f_{cr} > f_{cs} > f_{ct}$
 (c) $f_{cr} > f_{cs} < f_{ct}$ (d) $f_{cs} > f_{cr} > f_{ct}$
137. Lapping is an operation of
 (a) Making a cone-shaped enlargement of the end of a hole
 (b) Smoothing and squaring the surface around a hole
 (c) Sizing and finishing a small diameter hole
 (d) Producing a hole by removing metal along the circumference of a hollow cutting tool
138. A centrifugal pump will start delivering liquid only when the pressure rise in the impeller is equal to the
 (a) Kinetic head (b) Velocity head
 (c) Manometric head (d) Static head
139. The length of the latus rectum of the parabola $y^2 = ax$ is _____
 (a) $4a$ (b) a (c) $a/4$ (d) $2a$
140. In a shaper, the length of stroke is increased by
 (a) Increasing the centre distance of bull gear and crank pin
 (b) Decreasing the centre distance of bull gear and crank pin
 (c) Increasing the length of the arm
 (d) Decreasing the length of the slot in the slotted lever
141. The under given rule, correction to latitude or departure) of any side is called
 Total error in latitude (or) departure \times
 $\frac{(\text{Latitude}(\text{or} \text{departure}) \text{ of that side})}{(\text{Algebraic sum of latitudes or departure})}$
 (a) Bowditch rule (b) Transit rule
 (c) Rankines rule (d) Huygen's rule

142. The discharge of a double acting reciprocating pump is

- (a) L.A.N. (b) 2 L.A.N.
(c) $\frac{L.A.N.}{60}$ (d) $\frac{2 L.A.N.}{60}$

Where L = Length of stroke
A = Cross-sectional area of piston, and
N = Speed of crank in r.p.m.

143. The ratio of specific weight of a liquid to the specific weight of pure water at a standard temperature is called

- (a) Density of liquid (b) Specific gravity of liquid
(c) Compressibility of liquid
(d) Surface tension of liquid

144. The cutting tool in a milling machine is mounted on

- (a) Spindle (b) Arbor (c) Column (d) Knee

145. M 15 grade concrete (1 : 2 : 4) the moment of resistance factor is

- (a) 0.87 (b) 8.5 (c) 7.5 (d) 5.8

146. For air borne application and materialization of GPS receiver and easy construction, the most frequently used antenna is:

- (a) Microstrip (b) Micropole
(c) Sprialhelix (d) Choke ring

147. The mercury does not wet the glass. This is due to the property of the liquid known as

- (a) Cohesion (b) Adhesion
(c) Viscosity (d) Surface tension

148. Slip of a reciprocating pump is negative, when

- (a) Suction pipe is short and pump is running at low speeds
(b) Delivery pipe is long and pump is running at high speeds
(c) Suction pipe is short and delivery pipe is long and the pump is running at low speeds
(d) Suction pipe is long and delivery pipe is short and the pump is running at high speeds

149. The process of removing metal by a cutter which is rotated in the same direction of travel of work piece, is called

- (a) Up milling (b) Down milling
(c) Face milling (d) End milling

150. The absolute pressure is equal to

- (a) Gauge pressure + atmospheric pressure
(b) Gauge pressure – atmospheric pressure
(c) Atmospheric pressure – gauge pressure
(d) Gauge pressure – vacuum pressure

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

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GROUP A GRAND TEST – ANSWER KEY

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