

MIZORAM PUBLIC SERVICE COMMISSION

TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO JUNIOR ENGINEER (J.E) UNDER PUBLIC HEALTH ENGINEERING AND PUBLIC WORKS DEPARTMENTS, APRIL, 2016

CIVIL ENGINEERING PAPER - II

Time Allowed : 2 hours

Full Marks : 150

Attempt all questions.

All questions carry equal marks of 2 each.

1. Estimation is computations of the X required and cost likely to be incurred in the construction work. Find the appropriate word for X.
(a) materials (b) quantities
(c) equipments (d) labourers
2. The term 'Procurement' essentially means
(a) buying (b) selling
(c) acquisition (d) exchange
3. Which of the following Estimates is prepared for execution of additional items or items of work not included in the original detailed estimate?
(a) Revised Estimate (b) Preliminary Estimate
(c) Supplementary Estimate (d) Detailed Estimate
4. For accuracy, cubic contents of woodwork shall be measured to the nearest of
(a) 1.00 cum (b) 0.10 cum
(c) 0.01 cum (d) 0.001 cum
5. Plastering shall be measured in
(a) m (b) sqm
(c) cum (d) 10 cum
6. In general, the main components of Analysis of Rates are cost of Materials and
(a) Labour (b) Water
(c) Sundries (d) Contractor's profit
7. Valuation of anything is an estimation of its value in terms of
(a) quantity (b) money
(c) equipments (d) materials
8. If V= Volume of cutting or banking, D=Distance between the Sections, A_1, A_2 etc the areas of different cross-sections, then the Volume is given by, $V= D/2 \{ A_0 + 2A_1 + 2A_2 + \dots \dots 2A_{n-2} + A_n \}$. The Method for Volume calculation as above is
(a) Prismoidal Method (b) Mid – Sectional Area Method
(c) Trapezoidal Method (d) Mean – Sectional Area Method

9. If V = Volume of cutting or banking, A_1, A_2 etc the areas of different cross-sections, then the Volume is given by, $V = 1/3 \{ A_1 + A_2 + A_3 \} \times \text{Length}$. The Method for Volume calculation as above is
- (a) Prismoidal Method (b) Mid – Sectional Area Method
(c) Trapezoidal Method (d) Mean – Sectional Area Method
10. The term ‘Depreciation’ is used for measuring the
- (a) fall in value (b) rise in value
(c) rate of change of value (d) profit and loss
11. Zoning theory is used in valuation of land in the
- (a) Flat Rate System (b) Comparative System
(c) Belting System (d) Development System
12. For valuation of buildings, the Capital value is found out from Capital Value = the product of Net Income per annum and Year’s Purchase. Which of the following use the above method of valuation?
- (a) Direct Comparison Method (b) Cost Method
(c) Profit basis Method (d) Investment Method
13. Sinking fund is an amount
- (a) set aside annually (b) rent collected annually
(c) annual depreciation (d) annual increase in value
14. The value realized by sell of a structure or machinery which has outlived its span of life is
- (a) Assessed Value (b) Scrap Value
(c) Depreciated Value (d) Distress Value
15. Brickwork, more than one brick thick, shall be measured in
- (a) m (b) sqm
(c) cum (d) 10 cum
16. As per IRC Specifications, the minimum width for Right-of-way for double-lane National Highways in open areas is
- (a) 20 m (b) 24 m
(c) 26 m (d) 28 m
17. As per IRC Specifications, the minimum Carriageway width for double-lane National Highways in hilly areas is
- (a) 6.00 m (b) 6.50 m
(c) 7.00 m (d) 7.50 m
18. Road Rollers of various types are extensively used in modern highway construction projects. They are used for
- (a) Consolidation (b) Compression
(c) Contraction (d) Compaction
19. This layer is also known as ‘Drainage Layer’ in modern flexible pavement construction. Identify the layer.
- (a) Sub-grade (b) Granular Sub-base
(c) Wet Mix Macadam (d) Mix Seal Surfacing
20. California Bearing Ratio (CBR) test is conducted on this layer to determine pavement thickness in modern flexible pavement construction. Identify the layer.
- (a) Sub-grade (b) Granular Sub-base
(c) Water Bound Macadam (d) Wet Mix Macadam

21. As per IRC, the theoretical compacted thickness of an Water Bound Macadam layer is always in multiples of
- (a) 6.00 cm (b) 6.50 cm
(c) 7.00 cm (d) 7.50 cm
22. Los Angeles Abrasion (LAA) test is conducted on this layer in flexible pavement construction. Identify the layer.
- (a) Sub-grade (b) Granular Sub-base
(c) Wet Mix Macadam (d) Sand Seal Coat
23. Sand Replacement method is adopted for testing WMM layer in a flexible pavement construction work in progress. What properties of the WMM layer is being tested?
- (a) California Bearing Ratio (b) Aggregate Impact Value
(c) Gradation (d) Field Density
24. One of the two fundamental principles upon which various survey methods are based is : To work
- (a) from the part to the whole (b) from the whole to the part
(c) in a team (d) independently
25. 3, 4 and 5 method is adopted using a chain or tape for setting out a/an
- (a) acute angle (b) right angle
(c) obtuse angle (d) straight angle
26. The Fore Bearing of a line AB in the Whole Circle Bearing System is $142^{\circ}18'$. What will be its Back bearing in the same System?
- (a) $322^{\circ}18'$ (b) $284^{\circ}36'$
(c) $232^{\circ}18'$ (d) $52^{\circ}18'$
27. The Fore Bearing of a line AB in the Whole Circle Bearing System is $132^{\circ}38'$. What will be its Fore Bearing in the Quadrantal Bearing System?
- (a) S $47^{\circ}22'$ W (b) S $42^{\circ}38'$ E
(c) S $47^{\circ}22'$ E (d) S $47^{\circ}22'$ W
28. The method of levelling in which the difference in elevation between two points is accurately determined by two sets of observations when it is not possible to set up the level midway between the two points is
- (a) Check Levelling (b) Reciprocal Levelling
(c) Differential Levelling (d) Profile Levelling
29. In a series of readings taken on intermediate points with a levelling staff of a Dumpy level, it is found that the staff readings gradually decrease from 2.110 to 0.880. This indicate
- (a) Increase in RL of Intermediate points (b) No Change in RL
(c) Decrease in RL of Intermediate points (d) Increase in RL of BM
30. A Contour may be defined as a line on a map joining different points with the same
- (a) pressure (b) rainfall
(c) elevation (d) temperature
31. Nature of Impurity in hardness of water due to the presence of Carbonates and bicarbonates of Calcium and Magnesium is
- (a) suspended (b) dissolved
(c) organic (d) vegetable

32. An impurity which is an optical property of water sample measured by the degree of absorption of light rays is
- (a) Acidity (b) Alkalinity
(c) Turbidity (d) Hardness
33. The primary source of water supply is Precipitation. The most important form of Precipitation is
- (a) Rainfall (b) Snow
(c) Dew (d) Hail
34. The majority of Indian cities derive their water supply from
- (a) lakes (b) rivers
(c) wells (d) springs
35. Removal of very fine and light colloidal impurities like gels and emulsions from water is achieved by means of
- (a) Filtration (b) Chlorination
(c) Coagulation (d) Aeration
36. The most reliable method of distribution of water from a reservoir to domestic households is by
- (a) pumping (b) gravity
(c) vehicle transportation (d) siphoning
37. The most suitable system of sewerage for Indian conditions is
- (a) separate (b) combined
(c) partially combined (d) lateral
38. In which of the general processes does 'Screening process' included in Sewage Treatment Methods?
- (a) preliminary (b) secondary
(c) settlement (d) biological
39. For large flows in Surface drains, the best section, hydraulically, is provided by
- (a) rectangular section (b) circular section
(c) V-shaped section (d) trapezoidal section
40. Gaseous impurities contribute a significant portion of Air pollution. Which of the following is not an air pollutant?
- (a) Carbon monoxide (b) Sulphur dioxide
(c) methane (d) benzene
41. Depending upon the way in which the members are connected, Riveted joints mainly consist of two types : viz Lap Joint and
- (a) Single Joint (b) Double Joint
(c) Multiple Joint (d) Butt Joint
42. The centre to centre distance between two consecutive rivets measured parallel to the direction of force is known as
- (a) gauge (b) pitch
(c) line (d) lap
43. A rivet may fail due to Bearing and
- (a) Buckling (b) Tearing
(c) Shearing (d) Packing

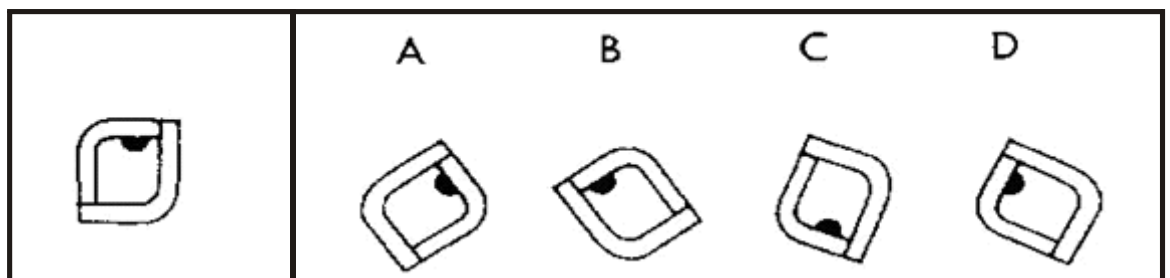
44. In bolted joints, the combined thickness of two plates connected by bolts is known as
- (a) grip length
 - (b) slip length
 - (c) bolt length
 - (d) torque length
45. The Efficiency of a riveted joint is defined as the ratio, expressed in percentage, of the least strength of a riveted joint to
- (a) bearing strength of rivet
 - (b) strength of solid plate
 - (c) rivet value
 - (d) tearing strength of plate
46. In design of Riveted Joints, the following have to be determined; (i) Number of rivets (ii) Pitch of rivets and (iii)
- (a) gauge of rivets
 - (b) diameter of rivets
 - (c) strength of rivets
 - (d) thickness of rivets
47. In comparison to riveted joints, welded joints are
- (a) heavier
 - (b) less rigid
 - (c) lighter
 - (d) costlier
48. What type of Weld is also known as Groove Weld?
- (a) Fillet Weld
 - (b) Spot Weld
 - (c) Pipe Weld
 - (d) Butt Weld
49. Which of the following is included in the basic assumptions for design of riveted joints?
- (a) load is equally shared by all rivets
 - (b) the end rivets get maximum loads.
 - (c) the middle rivets get maximum loads.
 - (d) the load decreases from support end to the free end.
50. The perpendicular distance between the corner and hypotenuse of the welded cross-section in a Fillet Weld is known as
- (a) legs of the weld
 - (b) size of the weld
 - (c) effective length
 - (d) throat thickness
51. In a compression steel member, the maximum slenderness ratio may be defined as the ratio of effective length to the appropriate
- (a) Modulus of Elasticity
 - (b) Compressive stress
 - (c) Radius of gyration
 - (d) Moment of Inertia
52. What section of steel beams are normally utilised for fabrication of square and rectangular steel water tanks?
- (a) ISLB
 - (b) ISMB
 - (c) ISWB
 - (d) ISHB
53. Apart from riveted rectangular and pressed steel tanks, what shape of steel water tanks are commonly used?
- (a) Trapezoidal
 - (b) Spherical
 - (c) Cylindrical
 - (d) V-shaped
54. Pressed steel water tanks are fabricated together by joining together pressed steel plates by means of
- (a) rivets
 - (b) pins
 - (c) welds
 - (d) bolts

55. The height of a Pressed steel tank will be multiples of
- (a) 1.00 m (b) 1.25 m
(c) 1.50 m (d) 1.75 m
56. In Mizoram, Administrative Approval for all works under PWD is accorded from the Office of the
- (a) Engineer-in-Chief, PWD (b) Secretary, PWD
(c) Secretary, Finance Department (d) Minister, PWD
57. Public Works Department, normally, publish a booklet listing all the likely items of work with per unit cost of such items to be extensively used for preparation of Estimates. Such a booklet is known as
- (a) Schedule of Works (b) Analysis of Rates
(c) Schedule of Rates (d) Cost Index
58. Normally 10 % of the amount is deducted from every Contractor's Bill to be released after a lapse of 6 months (sometimes 1 year or more) from the date of Completion of the work. Such deductions are known as
- (a) Security Deposit (b) Earnest Money
(c) Advance Payment (d) Performance Guarantee
59. A Contractor has to deposit to the Department a Bank Guarantee to receive
- (a) Security Deposit (b) Earnest Money
(c) Advance Payment (d) Performance Guarantee
60. A Contractor has to deposit some percentage of the Estimated Cost while participating in the Tendering process in order to show his eagerness and commitment in the Contract process. Such an amount is known as
- (a) Security Deposit (b) Earnest Money
(c) Advance Payment (d) Performance Guarantee
61. Normally 3% of the Estimated Cost has to be provided to meet unforeseen expenditures while preparing Estimates. Such provisions are known as
- (a) Deviations (b) Extra and substituted items
(c) Expenditure Sanction (d) Contingencies
62. The committing, or threatening to commit, any act forbidden by the IPC or the unlawful detaining, or threatening to detain, any property, to the prejudice of any person whatever, with the intention of causing any person to enter into an agreement is
- (a) misrepresentation (b) coercion
(c) undue influence (d) fraud
63. A contract is said to be induced by X where the relations subsisting between the parties are such that one of the parties is in a position to obtain an unfair advantage over the other. Find the appropriate replacement for X.
- (a) misrepresentation (b) coercion
(c) undue influence (d) fraud
64. A contract by which one party promises to save the other from loss caused to him by the conduct of the promisor himself, or by the conduct of any other person, is called a contract of
- (a) guarantee (b) indemnity
(c) bailment (d) pledge

65. The delivery of goods by one person to another for some purpose, upon a contract that they shall, when the purpose is accomplished, be returned or otherwise disposed off according to the directions of the person delivering them is known as
- (a) guarantee (b) indemnity
(c) bailment (d) pledge
66. To bake two muffins it takes $3\frac{1}{2}$ cups of sugar at about 11 paisa per cup. How much would it cost to purchase the sugar necessary to make 16 muffins?
- (a) 2.42 (b) 3.60
(d) 2.92 (d) 3.08
67. The next number in the following sequence would be 3, 5, 8, 13, 21, 34, ____.
- (a) 22 (b) 55
(c) 53 (d) 47
68. What does it mean to say “don’t judge a book by its cover”?
- (a) Don’t believe everything you hear
(b) In judging a person or an object, do not look at outward appearance alone
(c) Well-bound books often have cheap covers
(d) Someone else’s situation always seems better than our own
69. A substitute for “one who likes to spend time with others” in one word can be
- (a) Introvert (b) Commoner
(c) Extrovert (d) Extraordinary
70. Mark the one alternative that is nearest in meaning to the word - Nullify
- (a) Impress (b) No effect
(c) Seclude (d) Astound

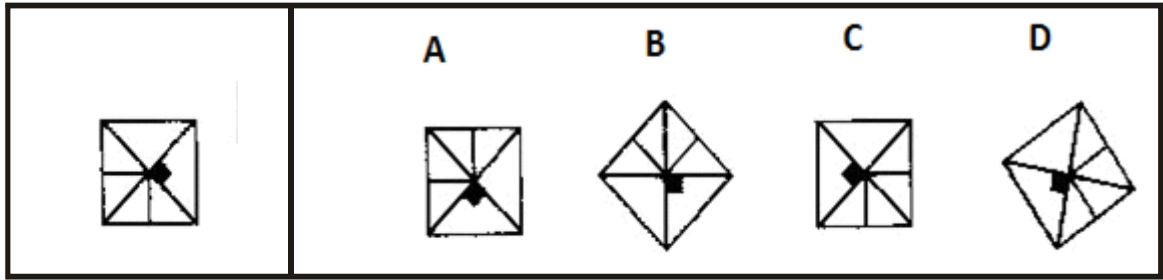
Directions (Questions 71 & 72): Each problem in this test consists of one figure on the left of a vertical line and four figures on the right. You are to decide which of the four figures on the right is the same as the figure on the left.

71.



- (a) A (b) B
(c) C (d) D

72.

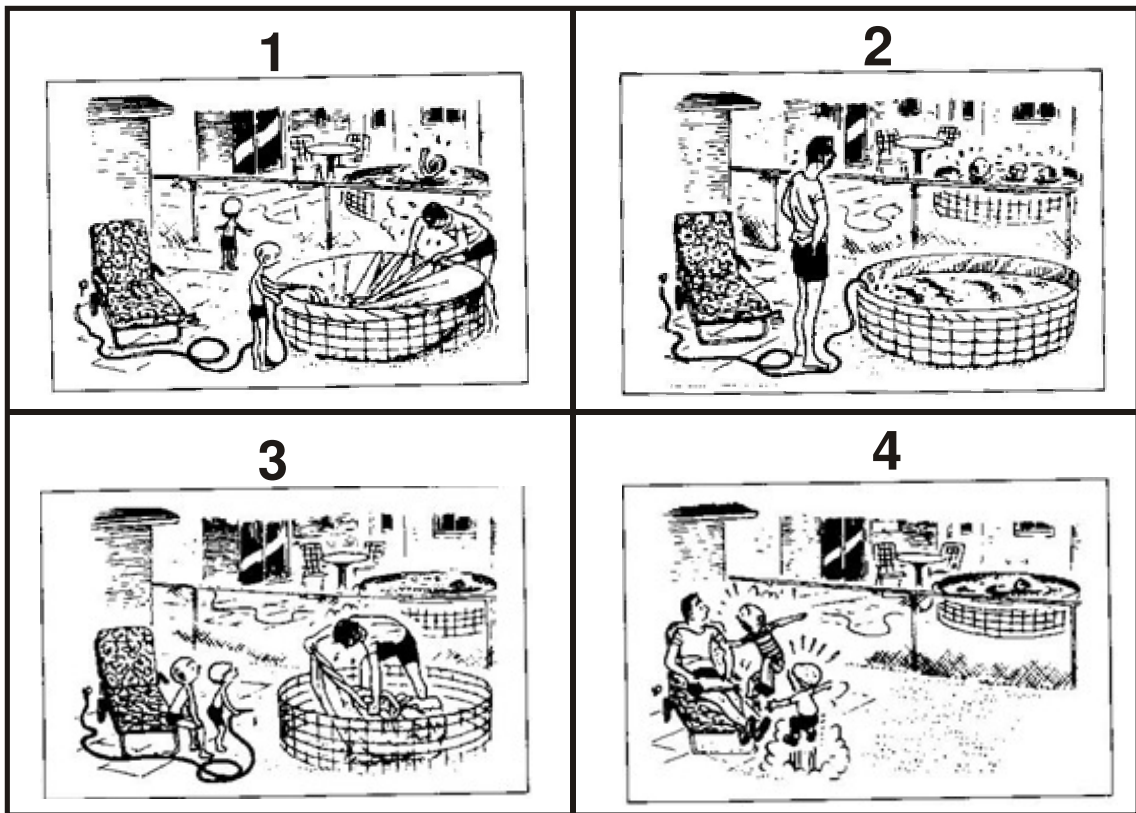


- (a) A
- (c) C

- (b) B
- (d) D

Directions (Question 73): Here are some pictures for you to arrange. They are mixed up and you are to put them in the right order so that they make the most sensible story. Choose the correct one of the following possible.

73.



- (a) 1 4 3 2
- (c) 4 3 2 1

- (b) 4 1 2 3
- (d) 1 2 3 4