

MIZORAM PUBLIC SERVICE COMMISSION

TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF ASSISTANT CONTROLLER OF MINES UNDER COMMERCE & INDUSTRIES DEPARTMENT GOVERNMENT OF MIZORAM, OCTOBER, 2022

PAPER - IV (TECHNICAL)

Time Allowed : 3 hours

Full Marks : 200

All questions carry equal marks of 2 each.

Attempt all questions.

1. Investment appraisal techniques are also known as:
 - (a) Commercial budgeting techniques
 - (b) Capital budgeting techniques
 - (c) Economic budgeting techniques
 - (d) Annual budgeting technique
2. Which one is used for non-discounting techniques ?
 - (a) Net present value
 - (b) Profitability index
 - (c) Payback period
 - (d) Commercial index
3. What causes depreciation of an asset?
 - (a) Wear and tear
 - (b) Loss of goods
 - (c) Increased liability
 - (d) Purchase of goods
4. The depreciation remains constant according to which method?
 - (a) Declining balance method
 - (b) Universal method
 - (c) Written down value method
 - (d) Straight line method
5. In future worth/value analysis the revenue is assigned with:
 - (a) Negative sign
 - (b) Positive sign
 - (c) Division sign
 - (d) Multiple sign
6. Choose the correct one:
 - (a) Redemption is the profit obtained by selling old articles
 - (b) Redemption is the interest obtained from bank deposit
 - (c) Redemption is the repayment of a fixed-income security
 - (d) Redemption is the profit obtained after selling share in stock market
7. The depletion rate per unit of natural resource can be calculated as:
 - (a) $\text{Depletion rate} = (\text{Depletion base} - \text{salvage value}) / \text{total unit to be extracted}$
 - (b) $\text{Depletion rate} = (\text{Depletion base} + \text{salvage value}) / \text{total unit to be extracted}$
 - (c) $\text{Depletion rate} = (\text{Depletion base} \times \text{salvage value}) / \text{total unit to be extracted}$
 - (d) $\text{Depletion rate} = (\text{Depletion base} \div \text{salvage value}) / \text{total unit to be extracted}$
8. The measure of central tendencies are:
 - (a) Standard deviation, range, mode
 - (b) Mean, median, mode
 - (c) Variance, mean, standard deviation
 - (d) All of the above
9. If the number of observations for noise data collected in the buffer zone of an opencast mine is 11 and the mean value is 23, the sum of observations is:
 - (a) 283
 - (b) 278
 - (c) 263
 - (d) 253

10. The simple relation between mean, median and mode is:
- (a) $Mean = 3(Mode) - 2(Median)$ (b) $Mode = 3(Median) - 2(Mean)$
(c) $Median = 3(Mean) - 2(Mode)$ (d) $Mode = 3(Mean) - 2(Median)$
11. What is the formula for the median of grouped data if $L =$ lower limit of median class; $cf =$ cumulative frequency of the class prior to median class; $f =$ frequency of median class; $h =$ class size and $n =$ total frequency?
- (a) $Median = L + [(n/2 - cf)/f] \times h$ (b) $Median = L + [(n/2 + cf)/f] \times h$
(c) $Median = L + [(n/2 - cf)/f] \div h$ (d) $Median = L \times [(n/2 - cf)/f] \times h$
12. The dominant frequencies of ground vibration waves recorded within 100 to 500 m from the blasting site are: 8 Hz, 25 Hz, 32 Hz, 6 Hz, 25 Hz, 45 Hz, 16 Hz, 17 Hz. What is the Mode of frequency?
- (a) 8 Hz (b) 45 Hz
(c) 6 Hz (d) 25 Hz
13. If $S =$ Summation; $X_i =$ Observations or values; $M =$ Mean; $N =$ number of observations, the formula to calculate the mean deviation (MD) for an individual series is:
- (a) $\frac{\sum_{i=1}^N [X_i + M]}{N}$ (b) $\frac{\sum_{i=1}^N [N - X_i]}{M}$
(c) $\frac{\sum_{i=1}^N [X_i - M]}{N}$ (d) $\frac{\sum_{i=1}^N [X_i - N]}{M}$
14. Coefficient of variation is a percentage expression of:
- (a) Mean deviation (b) Quartile deviation
(c) Standard deviation (d) None of the above
15. Normal distribution is applied for:
- (a) Continuous Random Distribution (b) Discrete Random Variable
(c) Irregular Random Variable (d) Uncertain Random Variable
16. Skewness of Normal distribution is:
- (a) Negative (b) Positive
(c) Zero (d) Undefined
17. Poisson distribution is applied for:
- (a) Continuous Random Variable (b) Discrete Random Variable
(c) Irregular Random Variable (d) Uncertain Random Variable
18. The mean of exponential distribution is given as:
- (a) $1/1$ (b) $1/1^2$
(c) 1^2 (d) 1^3
19. In an explosive magazine, there are 8 explosives made of IEL Orica, 7 made of Solar Energies Limited and 6 made of Gulf Oil Corporation Limited. All the explosives are of same diameter, length, weight and colour. One explosive is picked up randomly. What is the probability that it is made of neither IEL Orica nor Gulf Oil Corporation Limited?
- (a) $2/3$ (b) $1/2$
(c) $1/3$ (d) $2/5$
20. The probability that a hydraulic shovel randomly picked up from a production unit is defective is 0.1. The probability that out of 10 hydraulic shovels randomly picked up, 3 are defective is:
- (a) 0.001 (b) 0.057
(c) 0.106 (d) 0.002

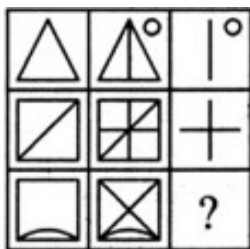
21. The three major steps involved in mineral processing are:
- (a) Extraction, processing and screening
 - (b) Exploration, extraction and comminution
 - (c) Crushing, grinding and floatation
 - (d) Mining, transportation and marketing
22. The ore obtain from run of mine (ROM) initially goes to:
- (a) Primary crusher
 - (b) Secondary crusher
 - (c) Tertiary crusher
 - (d) None of the above
23. Jaws of the crushers are made of:
- (a) Copper
 - (b) Aluminium
 - (c) Alloy cast steel
 - (d) PVC Material
24. Selection of crusher is mainly done on the basis of particle:
- (a) Specific gravity
 - (b) Shape
 - (c) Tensile strength
 - (d) size
25. In grinding mill operation, the mill charge should be about:
- (a) 25% of the total inner volume of the grinding mill
 - (b) 45% of the total inner volume of the grinding mill
 - (c) 75% of the total inner volume of the grinding mill
 - (d) 100% of the total inner volume of the grinding mill
26. For well dispersed pulps, free settling dominates when the percentage by weight of solid is:
- (a) Less than about 15%
 - (b) Less than about 50%.
 - (c) Less than about 75%
 - (d) Less than about 80%
27. Choose the correct one:
- (a) The hindered-settling ratio is always equal to the free-settling ratio
 - (b) The hindered-settling ratio is always less than the free-settling ratio
 - (c) The hindered-settling ratio is always greater than the free-settling ratio
 - (d) None of the above
28. Jigging method is mainly used to concentrate:
- (a) Fine materials
 - (b) Relatively coarser materials
 - (c) Heavy materials
 - (d) Light materials
29. The lighter material from the top layer of a jig which continuously discharge from the jig box during jigging process is called:
- (a) Jig hutch
 - (b) Jig flow
 - (c) Jig tails
 - (d) Jig bed
30. Dense medium separation (DMS) is a technique used to separate particles based on:
- (a) Specific gravity
 - (b) Hardness
 - (c) Coarseness
 - (d) Block size
31. What is the laboratory test defined for heavy medium separation?
- (a) Weight test
 - (b) Bubble test
 - (c) Strength test
 - (d) Float and sink test
32. Which of the following is naturally floatable mineral?
- (a) Coal
 - (b) Gypsum
 - (c) Talk
 - (d) Pyrite

33. In direct floatation technique:
- (a) Both mineral and gangue stick to the air bubble and settle down at the bottom
 - (b) The gangue sticks to the air bubble and ore particle settle down at the bottom
 - (c) The mineral sticks to the air bubble and gangue settle down at the bottom
 - (d) All of the above
34. Coal washing is accomplished by:
- (a) Jigging
 - (b) Float flotation
 - (c) Heavy liquid separation
 - (d) None of the above
35. Coal washing is carried out in order to:
- (a) Reduce ash percentage
 - (b) Reduce spontaneous heating
 - (c) Increase oxygen percentage
 - (d) Easy transportation
36. According to Mizoram Minor Mineral Concession Rules 2000, the period for which a Mining Lease be granted or renewed shall not ordinarily be more than:
- (a) 5 Years
 - (b) 10 Years
 - (c) 15 Years
 - (d) 20 Years
37. As per Mizoram Minor Mineral Concession Rules 2000, maximum area for which mining lease may be granted in the State in respect of any minor mineral should not be:
- (a) Less than 100 hectares
 - (b) More than 100 Hectares
 - (c) More than 100 Sq km
 - (d) None of the above
38. Based on Mizoram Minor Mineral Concession Rules 2000, which among these does not belongs to the minor mineral?
- (a) Building stone including shell limestone
 - (b) Gravel
 - (c) Limestone
 - (d) Coal
39. As per Mizoram Minor Mineral Concession Rules 2000, no mining operation should be carried out within:
- (a) 50 metres of public work
 - (b) 100 metres of public work
 - (c) 300 metres of public work
 - (d) 500 metres of public work
40. According to Mizoram Minor Mineral Concession Rules 2000, the penalty for filling wrong returns or maintaining incorrect accounts is:
- (a) Rs. 1000/-
 - (b) Rs. 2000/-
 - (c) Rs. 3000/-
 - (d) None of the above
41. Mines Act 1952 not to apply where it is in opencast working the number of persons employed on any does not exceed?
- (a) 20
 - (b) 40
 - (c) 50
 - (d) 100
42. Workman's inspector is assigned through:
- (a) Election
 - (b) Deputation
 - (c) Selection
 - (d) Nomination
43. Risk Assessment consists of:
- (a) Identification of Hazards
 - (b) Probability of Risk
 - (c) Risk Rating
 - (d) All of the above
44. Accident due to blasting generally occurs during:
- (a) Joining of face
 - (b) Fly rock during blasting
 - (c) During Misfire
 - (d) All of the above

45. Appeal to Chief Inspector against order of Regional Inspector under CMR, 2017 can be made within _____ days.
- (a) 10 (b) 20
(c) 30 (d) 15
46. Information regarding Reportable injury shall be sent to Chief Inspector and Regional Inspector immediately when persons involved are equal to or more than:
- (a) 4 (b) 5
(c) Irrespective of number of person (d) Never sent
47. What should be the maximum plotting errors of a plan made on 1:2000 scale?
- (a) 10 cm (b) 50 cm
(c) 25 cm (d) 5 cm
48. Terms of Chairman of Committee constituted under Section 12 of Mines Act 1952 is?
- (a) 3 years (b) 2 years
(c) 5 years (d) 1 years
49. According to which section of Mines Act, 1952 the provision on occupational health survey is done?
- (a) 9 (b) 9A
(c) 10 (d) 11
50. Annual return of a mine preceding year shall be submitted on or before _____ of every year.
- (a) 1st February (b) 14th January
(c) 30th April (d) 31st October
51. What is the term of imprisonment for the inspector disclosing secret information?
- (a) 1 year (b) 2 years
(c) 3 years (d) 6 month
52. Who has the power to make rules and regulations?
- (a) Committee (b) Central Government
(c) Either of the above (d) Chief Inspector
53. As per the Mineral Concession Rules 1960, the Reconnaissance Permit to be executed within _____ months of the date of the communication of the order:
- (a) 12 (b) 9
(c) 3 (d) 6
54. Sand not be treated as minor mineral when used for certain purposes as:
- (a) Purpose of Refractory and manufacture of ceramic
(b) Optical purpose
(c) Purpose of stowing in coal mines
(d) All of the above
55. In Section 8 of The Mines and Minerals (Development and Regulation) Act, 1957, the maximum period for which a mining lease may be granted shall not exceed _____ years.
- (a) Thirty (b) Twelve
(c) Twenty (d) Five
56. According to the Explosive Rules 2008, a shot firer (holding valid certificate issued by the Controller of Explosive) can do blasting in:
- (a) Other than mining area (b) Mining area
(c) In both (a & b) (d) None of the above

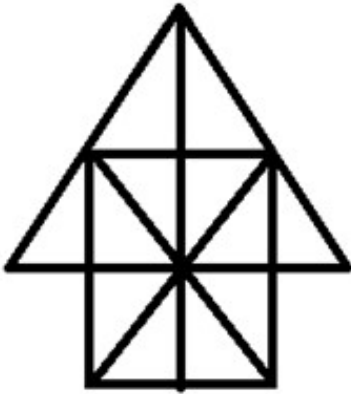
57. According to regulation 119 of CMR 2017, No working shall be made within _____ from any railway or any public works/road.
- (a) 45 m (b) 30 m
(c) 60 m (d) 100 m
58. What is the minimum floor space required for a first aid room in a mine?
- (a) 8 m² (b) 10 m²
(c) 12 m² (d) 15 m²
59. Who shall be held responsible for supply of materials & appliances for the purpose of carrying out of the Act & Regulations in mines?
- (a) Manager (b) Owner/Agent
(c) Safety Officer (d) General Manager
60. Who shall inform the manager for any unusual change in barometric pressure?
- (a) Overman (b) Sampling in charge
(c) Ventilation officer (d) Assistant Manager
61. The term Representative factor (RF) is associated with.
- (a) Mine drainage (b) Mine plan
(c) Mine air sampling (d) Mine ventilation
62. As per MMR 1961, no winding rope shall be used in a shaft exceeding 1500 m in depth if its safety factor is less than:
- (a) 2 (b) 3
(c) 4 (d) 5
63. According to CMR, 2017 every travelling roadway shall be not less than _____ high for the entire stretch.
- (a) 1.8 m (b) 1.2 m
(c) 1.5 m (d) 0.5 m
64. Which of the following disease is not declared in the official gazette of India as a disease connected with mining operation?
- (a) Silicosis (b) Pneumoconiosis
(c) Ankylostomiosis (d) Manganese poisoning nervous type
65. How many years of practical experience of below ground mines is mandatory for getting appointment of Rescue Superintendent?
- (a) 10 years (b) 6 years
(c) 15 years (d) 5 years
66. According to Oil mines Regulation 2017, the owner, agent and manager of a mine shall ensure that testing of blowout preventer assembly is conducted in accordance with the Oil Industry Safety Directorate Recommended Practices, that is:
- (a) OISD-RP-174 (b) OISD-PR-160
(c) OISD-STD-115 (d) None of Above
67. As per Explosive Rules 2008, permitted explosive means authorised explosive which is permitted by the Director General of Mines Safety to be used in:
- (a) Underground Coal Mines (b) Opencast coal Mines
(c) Metalliferous mines (d) All of the above

68. As per 3rd Schedule of Mines Rule, the number of first aid boxes to be provided in mines shall be @ one for every 'A' person employed. 'A' is given by:
- (a) 100 (b) 125
(c) 150 (d) 200
69. According to Coal Mine Regulation 2017, "competent person" in relation to any work or any machinery, plant or equipment means a person who has attained the age of:
- (a) 18 Yrs (b) 20 Yrs.
(c) 25 Yrs. (d) None of the above
70. What is the name of the place where the explosives are stored for the purpose of issuing it to an authorized person?
- (a) Explosive storage (b) Reserve station
(c) Magazine (d) Firing station
71. As per National Mineral Policy 2019, efforts shall be made by the Government to establish MTS which would primarily involve automating the entire concession life-cycle using state-of-the-art IT systems. What does MTS stand for?
- (a) Mineral Tenement System (b) Mineral Tender System
(c) Mining Tenement System (d) None of the above
72. As per Mines Rules 1955, for every mine wherein _____ or more persons are employed, the owner, agent or manager shall appoint a suitably qualified person as Welfare Officer.
- (a) 100 (b) 300
(c) 500 (d) 1000
73. What percentage of employees should undergo initial medical examination every year of the mine?
- (a) 10 % (b) 20 %
(c) 30 % (d) 40%
74. Identify the department from which the workmen's Inspector is not considered:
- (a) Mining (b) Civil
(c) Electrical (d) Mechanical
75. While blasting in hot strata the temperature of hole should not exceed:
- (a) 50° C (b) 60° C
(c) 70° C (d) 80° C
76. Select a suitable figure from the four alternatives that would complete the figure matrix.



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

77. In question below shown, count the number of triangle and squares.



- (a) 26 triangles, 5 squares (b) 28 triangles, 5 squares
(c) 26 triangles, 6 squares (d) 28 triangles, 6 squares
78. If one-third of one-fourth of a number is 15, then three-tenth of that number is:
(a) 35 (b) 36
(c) 45 (d) 54
79. Difference between a two-digit number and the number obtained by interchanging the two digits is 36, what is the difference between two numbers
(a) 2 (b) 4
(c) 8 (d) 12
80. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of?
(a) 300 kmph (b) 360 kmph
(c) 600 kmph (d) 720 kmph
81. In a bag, there are a certain number of toy-blocks with alphabets A, B, C and D written on them. The ratio of blocks A:B:C:D is in the ratio 4:7:3:1. If the number of 'A' blocks is 50 more than the number of 'C' blocks, what is the number of 'B' blocks?
(a) 650 (b) 480
(c) 578 (d) 350
82. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:
(a) No profit, no loss (b) 5%
(c) 8% (d) 10%
83. Karan and Arjun run a 100-meter race, where Karan beats Arjun by 10 meters. To do a favour to Arjun, Karan starts 10 meters behind the starting line in a second 100-meter race. They both run at their earlier speeds. Which of the following is true in connection with the second race?
(a) Karan and Arjun reach the finishing line simultaneously
(b) Arjun beats Karan by 1 meter
(c) Arjun beats Karan by 11 meters
(d) Karan beats Arjun by 1 meter

Direction (Questions No. 84 & 85) : In the following question no. 9 and 10 choose the word which is the exact **OPPOSITE** of the given words.

84. ENORMOUS

- (a) Soft
- (b) Average
- (c) Tiny
- (d) Weak

85. RELINQUISH

- (a) Abdicate
- (b) Renounce
- (c) Possess
- (d) Deny

Direction (Questions No. 86 & 87) : A part of the sentence is italicised and underlined. Below are given alternatives to the italicised part which may improve the sentence. Choose the correct alternative. In case no improvement is needed, option 'D' is the answer.

86. The workers are hell bent at getting what is due to them.

- (a) hell bent on getting
- (b) hell bent for getting
- (c) hell bent upon getting
- (d) No improvement

87. If the room had been brighter, I would have been able to read for a while before bed time.

- (a) If the room was brighter
- (b) If the room are brighter
- (c) Had the room been brighter
- (d) No improvement

Direction : Questions No. 88, choose the one which can be substituted for the given word/sentence.

88. Extreme old age when a man behaves like a fool

- (a) Imbecility
- (b) Senility
- (c) Dotage
- (d) Superannuation

Direction (Questions No. 89 & 90) : Questions consist of two words which have a certain relationship to each other followed by four pairs of related words, Select the pair which has the same relationship.

89. DIVA : OPERA

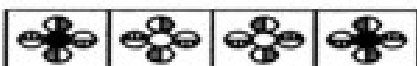
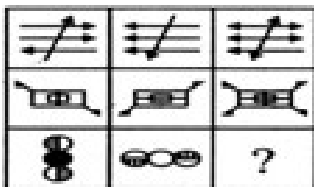
- (a) producer : theatre
- (b) director : drama
- (c) conductor : bus
- (d) thespian : play

90. PAIN : SEDATIVE

- (a) comfort : stimulant
- (b) grief : consolation
- (c) trance : narcotic
- (d) ache : extraction

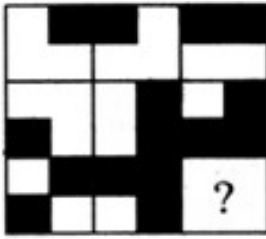
Direction (Questions No. 91 - 93) : Select a suitable figure from the four alternatives that would complete the figure matrix.

91.



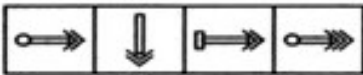
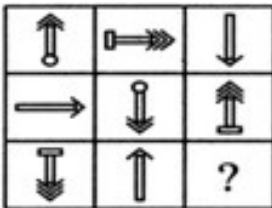
- (a)
- (b)
- (c)
- (d)

92.



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

93.



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

94. Find the odd letter/number/words from the following

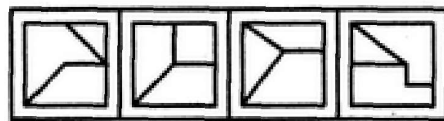
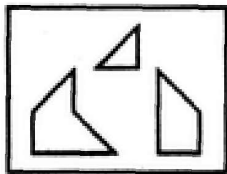
- (a) Plassey
- (b) Haldighati
- (c) Panipat
- (d) Sarnath

95. Find the odd letter/number/words from the following

- (a) 5720
- (b) 6710
- (c) 2640
- (d) 4270

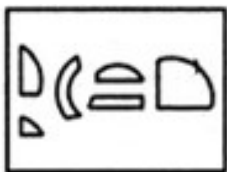
Direction (Questions No. 96 & 97) : Find out which of the figures (a), (b), (c) and (d) can be formed from the pieces given in figure (X).

96.



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

97.

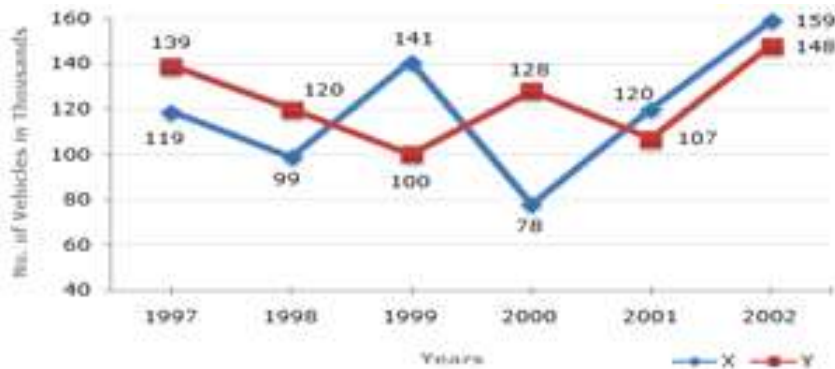


(a) (b) (c) (d)

Direction : Question No. 98 presents a situation and asks you to make a judgment regarding that particular circumstance. Choose an answer based on given information

98. Eileen is planning a special birthday dinner for her husband's 35th birthday. She wants the evening to be memorable, but her husband is a simple man who would rather be in jeans at a baseball game than in a suit at a fancy restaurant. Which restaurant below should Eileen choose?
- (a) Alfredo's offers fine Italian cuisine and an elegant Tuscan decor. Patrons will feel as though they've spent the evening in a luxurious Italian villa.
 - (b) Pancho's Mexican Buffet is an all-you-can-eat family style smorgasbord with the best tacos in town.
 - (c) The Parisian Bistro is a four-star French restaurant where guests are treated like royalty. Chef Dilbert Olay is famous for his beef bourguignon.
 - (d) Marty's serves delicious, hearty meals in a charming setting reminiscent of a baseball clubhouse in honor of the owner, Marty Lester, a former major league baseball all-star.

Direction (Questions No. 99 & 100) : Study the following line graph and answer the questions based on it.



99. In which of the following years, the difference between the productions of Companies X and Y was the maximum among the given years?
- (a) 1997
 - (b) 1998
 - (c) 1999
 - (d) 2000
100. The production of Company Y in 2000 was approximately what percent of the production of Company X in the same year?
- (a) 173
 - (b) 164
 - (c) 132
 - (d) 97

* * * * *