



AMIE STUDY CIRCLE
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STUDY MATERIAL (MCQ) FOR DGMS, GATE AND PSU EXAMS

WINNING AND WORKING

- Warm Up Questions
- Questions from DGMS Exams
- Questions from GATE Exams



91-9412903929



AMIESTUDYCIRCLE.COM



AMIESTUDYCIRCLE@GMAIL.COM



CITY PRIDE COMPLEX, CIVIL
LINES, ROORKEE

WINNING & WORKING

WARM UP QUESTIONS

1. In percussive drilling the rock is broken by following action

- (a) crushing
- (b) chipping*
- (c) both
- (d) none of above

Hint: Chipping technique employs a percussive drill bit that combines rotation with vertical hammering action. Hydraulic or pneumatic hammers provide the impact necessary to fracture rock. Each impact dislodges material, which is then removed through the use of flush water or air.

2. The drilling rods are made of

- (a) cast iron
- (b) steel,
- (c) Ni-Cr*
- (d) cast steel

3. Which is used for raising and lowering the rods of square section

- (a) Bulldog
- (b) sludger
- (c) retaining key*
- (d) none of the above

4. Which is used for raising and lowering the rods of circular section

- (a) Bulldog*
- (b) sludger
- (c) core barrel
- (d) retaining key

5. The sludge or cuttings in the borehole are removed with the help of

- (a) core barrel
- (b) sludger*
- (c) retaining key
- (d) bulldog

6. The device used to catch broken rods under a joint in the borehole

- (a) crow's foot or spiral worm*

- (b) sludger
- (c) screw feed
- (d) bulldog

7. The operation of tracing the broken and lost parts in the hole and withdrawing them to the surface is known as

- (a) lining the borehole
- (b) drilling
- (c) borehole survey
- (d) fishing the borehole*

Hint: "Fishing" is the process of retrieving lost or stuck equipment or debris from within the borehole. This is a specialized and often complex operation, requiring expertise and specialized tools.

8. What is the purpose of lining the borehole

- (a) to prevent caving of sides*
- (b) to prevent water percolation
- (c) to easy drilling operation
- (d) none of the above

9. The percussive drilling is applicable upto max depth of — m

- (a) 200
- (b) 300*
- (c) 500
- (d) 700

10. Diamond drilling is applicable upto a max depth of — m

- (a) 500
- (b) 1000
- (c) 3000*
- (d) 5000

11. Manual drilling is possible upto max depth of — m

- (a) 15
- (b) 30*
- (c) 45
- (d) 60

12. The core(dia in mm) size obtained with NX size

- (a) 21

- (b) 28
- (c) 40
- (d) 54*

13. The feed mechanism is not necessary beyond the depth of — m

- (a) 30
- (b) 40
- (c) 50
- (d) 60*

14. Single tube core barrel is suitable for recovering core from rocks of

- (a) soft
- (b) friable
- (c) homogeneous*
- (d) hard

15. Double tube core barrel is suitable for rocks of

- (a) hard
- (b) homogeneous
- (c) soft and friable*
- (d) none of the above

16. Bore hole deviation is — deg for 30 m

- (a) 1
- (b) 2*
- (c) 3
- (d) 4

17. Bore hole survey means —

- (a) Measurement of deviation*
- (b) Measurement of depth
- (c) Measurement of time taken
- (d) None of the above

18. In etch method which acid is used to measure borehole deviation

- (a) sulfuric acid
- (b) hydrochloric acid
- (c) nitric acid
- (d) Hydrofluoric acid*

19. Bentonite chemical is used for

- (a) sealing cracks
- (b) preparing mud flush*
- (c) surveying borehole deviation
- (d) none of the above

Hint: Bentonite mud flush, a drilling fluid, uses bentonite clay to stabilize borehole walls, flush

out cuttings, and lubricate drill bits, forming a filter cake that seals the borehole and prevents water ingress.

20. The improved technique of removal of the core during drilling without raising the drill rods

- (a) Double tube core barrel
- (b) X-ray drilling
- (c) wireline drilling*
- (d) side coring

Hint: Wireline drilling is a core drilling technique primarily used in mineral exploration and deep mining, allowing for efficient core sample extraction without removing the entire drill string, by using an overshot on a wireline cable to retrieve the core barrel

21. Controlling the course of a borehole so as to follow a predetermined path is —

- (a) deviation of borehole
- (b) wireline drilling
- (c) control drilling
- (d) directional drilling*

Hint: Directional drilling is a technique that involves drilling non-vertical bores to reach a specific underground target or location, enabling access to resources or infrastructure in areas that would be otherwise inaccessible with conventional vertical drilling.

22. The starting point of the shaft at the ground surface is called —

- (a) collar*
- (b) pithead
- (c) platform
- (d) scaffold

Hint: Shaft Collar is a massive, reinforced concrete structure at ground level, providing the foundation for the headframe and serving as an entry/exit point for workers, materials, and services.

23. Ventilation by mechanical means is provided in sinking shaft exceeding depth of — m

- (a) 30
- (b) 25*
- (c) 40
- (d) 15

24. The device used to prevent undue swinging of the bucket in sinking

- (a) shaft spider
- (b) kibble
- (c) scaffold
- (d) rider*

Hint: It is a common practice to use guide ropes in a sinking shaft and to prevent undue swinging of the bucket during its travel a rider is used in addition to the use of a locked coil rope for winding. The rider runs on the ropes supporting the walling scaffold and guides.

25. The safety device is provided in sinking shaft in case of

- (a) overwind spider*
- (b) kibble
- (c) detaching hook
- (d) rider

26. In blasting in shaft sinking the number of holes are — times the dia of the shaft in m

- (a) 2
- (b) 3*
- (c) 4
- (d) 1

27. The quantity of ventilating air (cu.m) shall be provided in the sinking shaft if the depth exceeds 25 m

- (a) 100
- (b) 200
- (c) 300*
- (d) 400

28. Upward drivage of the shaft is carried out for a distance up to — m

- (a) 15*
- (b) 25
- (c) 35
- (d) 45

29. A permanent lining where running sand is encountered during sinking is —

- (a) cementation
- (b) piling
- (c) concrete lining
- (d) tubbing*

Hint: "Tubbing" or "tubbing lining," which consists of cast iron or steel segments bolted together to resist hydrostatic and geostatic pressures.

30. The method of sinking through loose deposits of sand upto 20 m is

- (a) piling system
- (b) open caisson*
- (c) tubbing
- (d) cementation

Hint:

31. The method of sinking through loose deposits of sand upto 60 m is

- (a) piling
- (b) open caisson
- (c) forced drop*
- (d) cementation

Hint: Open Caissons/Well Foundation are large, cylindrical, watertight structures (like a well) that are sunk into the ground to create a foundation for structures like bridge piers or buildings.

32. The method of sinking through alternate loose and tough strata up to 60 m

- (a) piling
- (b) open caisson
- (c) forced drop*
- (d) cementation

Hint: For sinking through loose deposits of sand up to 60 meters, the Forced Drop Shaft Method is commonly employed, where hydraulic rams force down cast iron drums, especially when the drop shaft refuses to sink further due to high skin friction.

33. The method of sinking where there is a ground filling problem or considerable inrush of water up to a depth of 30 m

- (a) piling
- (b) open caisson
- (c) pneumatic caisson*
- (d) forced drop

Hint: For shaft sinking in unstable ground with the potential for ground filling or water inrush up to 30 meters deep, the pneumatic caisson method is a suitable approach. This method uses compressed air to keep water and loose material from entering the shaft during excavation.

34. The method of sinking in unstable or friable strata with a heavy inrush of

- (a) water tubbing
- (b) forced drop

- (c) cementation method
- (d) freezing method*

Hint: When sinking through unstable or friable strata with a heavy inrush of water, the freezing method is commonly employed, where artificial cooling is used to freeze the water-bearing strata around the shaft, creating a frozen wall to isolate the shaft and allow excavation.

35. In the freezing method of shaft sinking which is used for circulation

- (a) HCl
- (b) HNO_3
- (c) CaCl_2 *
- (d) NaCl

36. In the freezing method of sinking the removal of ice wall after completion of sinking by sending hot brine through holes is known as

- (a) defreezing
- (b) silicification
- (c) post freezing
- (d) thawing*

Hint: Once the shaft is completed and the frozen wall is no longer needed, the ice wall is removed by circulating hot brine through the same pipes that were used to freeze the ground. This process melts the ice and allows the shaft to be accessed and used.

37. The method of sinking used through any fissured water-bearing strata except in running sand is

- (a) pneumatic caisson
- (b) cementation*
- (c) forced drop
- (d) piling

Hint: Cementation Process involves treating the water-bearing strata with cement to reduce water inflow and stabilize the ground, allowing for safer and more efficient shaft sinking.

38. The process of treating holes with chemicals in the cementation method is called

- (a) freezing
- (b) silicification*
- (c) pre silicification
- (d) thawing

39. The holes treated with chemicals are called

- (a) treating holes
- (b) test holes
- (c) product holes*
- (d) weeping holes

40. In the cementation method the purpose of treating holes with chemicals-silicate of soda and aluminium sulfate is

- (a) To reduce the friction*
- (b) To seal cracks
- (c) quick setting of cement
- (d) none

41. The usual inclination for the inclines is

- (a) 1 in 3
- (b) 1 in 2
- (c) 1 in 4*
- (d) 1 in 1

42. An underground roadway through stone connecting 2 or more coal seams is

- (a) tunnel
- (b) cross measure drift*
- (c) crosscut
- (d) staple pit

Hint: Cross measure drift is a development heading driven from a level in one coal seam to intersect and work upper or lower seams.

43. For a coal seam of moderate dip the shaft may be located in the of the property rise,

- (a) middle
- (b) dip side*
- (c) 1/3 from
- (d) outcrop

44. The mode of an entry shall be by shaft if the coal seam lying depth of more than by minimum m

- (a) 20
- (b) 30*
- (c) 40
- (d) 50

45. As per Indian standards thick seam means having seam thickness

- (a) 1.5 - 4.5 m
- (b) 0 - 1.5 m
- (c) 4.5 - 9 m*
- (d) above 9 m

46. As per Indian standards steep mines means having seam dip(in deg) ——

- (a) 0 - 5
- (b) 5 - 18
- (c) 18 - 40*
- (d) above 40

47. As per Indian standards deep mines mean if the seam lying depth from the surface is ——

Less than

- (a) 200 m
- (b) 200-450 m*
- (c) 450-600 m
- (d) above 600 m

48. In deg I mine the % of inflammable gas is ——

- (a) less than 0.1*
- (b) 0.1 to 1
- (c) 1 - 10
- (d) above 10

49. A gallery which cuts across the pillars due to its driving along an apparent dip is called ——

- (a) crosscut*
- (b) level
- (c) dip
- (d) drift

50. The max width of the gallery in Indian coal mines is ——

- (a) 3 m
- (b) 4 m
- (c) 4.8 m*
- (d) 5.5 m

51. The travelling road height should not be less than ——

- (a) 1 m
- (b) 1.8 m*
- (c) 2.5 m
- (d) 3 m

52. The minimum pillar to pillar distance if the depth of seam is 250 m and gallery width is 4.2 m

- (a) 34.5 m
- (b) 30 m
- (c) 39 m*
- (d) 45 m

53. The minimum pillar to pillar distance if the depth of seam is 150 m and gallery width is 3.6 m (a) 16.5m

- (b) 19.5m*
- (c) 25.5m
- (d) 13.5m

54. The min pillar distance from centre to centre; if the depth of seam is 450 m and gallery width is 4.8 m

- (a) 39 m
- (b) 45 m
- (c) 48 m*
- (d) 52 m

55. The % of extraction if the depth of seam is 300 m and gallery width is 4.2 m

- (a) 11
- (b) 15
- (c) 17
- (d) 20*

56. The % of extraction if the depth of seam is 200 m and gallery width is 4.8 m

- (a) 33
- (b) 25*
- (c) 20
- (d) 40

57. The max length of the trailing cable is —— m

- (a) 50
- (b) 90*
- (c) 150
- (d) 200

58. Capacity of slusher is —— tph

- (a) 30 - 40*
- (b) 40 - 60
- (c) 10 - 20
- (d) 70 - 100

59. A landing or platform in a shaft including an excavation between the top and bottom of the shaft is called

- (a) mid-set landing
- (b) inset*
- (c) collar
- (d) cover

60. The process of conversion of chemical energy into heat and mechanical energy is called ———

- (a) oxidation*
- (b) combustion
- (c) detonation
- (d) none of the above

61. The amount of energy released by an explosive during blasting is called ———

- (a) Density
- (b) Strength*
- (c) Sensitivity
- (d) VOD

62. The rate at which the detonation wave passes thorough the column of explosive is called

- (a) Density
- (b) Strength
- (c) Sensitivity
- (d) VOD*

Hint: The rate at which the detonation wave travels through a column of explosive is called the velocity of detonation (VoD). This refers to the speed at which a shock wave, resulting from a rapid chemical reaction, propagates through an explosive material.

Detonation velocities for explosives typically range from 3,000 to 5,500 m/s.

Examples:

- C-4: 9000 m per second
- TNT: 7500 m per second
- Nitroglycerin: 7820 meters per second
- Detonating cord: 6,000–7,000 m/s

63. Shuttering effect is obtained with the explosive having higher

- (a) VOD*
- (b) medium VOD
- (c) slower VOD
- (d) without VOD

64. Which is the low density explosive

- (a) Gunpowder*
- (b) NG
- (c) slurry
- (d) ANFO

65. Hazard performance initiation propagation are related to one of the characteristics of an explosive

- (a) VOD
- (b) Stability
- (c) Sensitivity*
- (d) Density

66. The important characteristic of an explosive which will give an idea about heat and humid condition and time of

- (a) exposure resistance
- (b) stability*
- (c) sensitivity
- (d) density

67. The composition of Gunpowder is(charcoal: sulphur: potassium nitrate in %)

- (a) 15:10:75*
- (b) 25:10:65
- (c) 10:15:65
- (d) 15:75:10

68. Which explosive is blasted by safety fuse

- (a) ANFO
- (b) slurry
- (c) NG
- (d) Gunpowder*

69. To avoid freezing of NG explosive which agent is mixed

- (a) PETN
- (b) TNT
- (c) DI-NITRO-GLYCOL*
- (d) ASA

70. The VOD of premix is

- (a) 5000 m/s
- (b) 7000 m/s*
- (c) 3500 m/s
- (d) 3200 m/s

71. A chemical component having 3 properties- High explosive and Oxidising agent and cooling agent is

- (a) NG
- (b) Liquid oxygen
- (c) TNT
- (d) AN*

72. The VOD of OCG is

- (a) 5000 m/s
- (b) 7000 m/s
- (c) 6000 m/s*
- (d) 3500 m/s

73. In ANFO explosive the % of diesel oil is mixed for effective oxygen balanced explosive mixture is

- (a) 4-5%
- (b) 5-6%*
- (c) 6-7%
- (d) 7-9%

74. The VOD of ANFO is

- (a) 3500 m/s
- (b) 3000 m/s
- (c) 6000 m/s
- (d) 3200 m/s*

75. The amount of diesel oil mixed for 100 kg of AN is(dry season and wet season)

- (a) 5 and 6
- (b) 6 and 7
- (c) 7 and 9*
- (d) 10 and 12

76. What excess % of diesel oil will lower the sensitivity

- (a) 6 %
- (b) 7 %
- (c) 8 %*
- (d) 9 %

77. In ANFO the water content should not be more than

- (a) 6 %
- (b) 7 %
- (c) 8 %
- (d) 9 %*

77. The constituents in slurry explosive (TNT: AN: Water)

- (a) 20:15:65
- (b) 20:65:15*
- (c) 15:20:65
- (d) 65:15:20

78. The reducing agent in slurry explosive is

- (a) TNT*
- (b) AN
- (c) Water

(d) starch

79. The gelling agent in slurry explosive is

- (a) TNT
- (b) AN
- (c) Water
- (d) starch*

80. At least how much % the packed explosives are less effective than bulk explosives

- (a) 10
- (b) 15*
- (c) 20
- (d) 25

81. The sensitiser in Emulsion explosive is

- (a) AN
- (b) TNT
- (c) starch
- (d) microspheres*

82. The VOD of Emulsion explosive is

- (a) 5 km/s*
- (b) 3 km/s
- (c) 3.5 km/s
- (d) 7 km/s

83. The VOD of slurry explosive is

- (a) 5 km/s
- (b) 3 km/s
- (c) 3.3 km/s*
- (d) 7 km/s

84. With permitted explosive the duration of flame is

- (a) 1/100th second
- (b) 1/100th minute
- (c) 1/1000th second*
- (d) none

85. Sheathed explosive coated with a sheath of

- (a) NaCl
- (b) CaCO₃
- (c) NaHCO₃*
- (d) NaCO₃

86. In the detonator the priming charge is

- (a) PETN
- (b) TNT
- (c) ASA*
- (d) AN

Hint: In many detonators, the priming charge is a mixture known as ASA, which stands for a combination of lead azide, lead styphnate, and aluminum powder.

87. Safety fuse consist core of

- (a) AN
- (b) Gunpowder*
- (c) TNT
- (d) none of the above

Hint: a safety fuse's core consists of black powder, also known as gunpowder, which is typically a mixture of potassium nitrate, sulfur, and carbon, encased in a waterproofed textile tube.

88. The burning speed of the safety fuse is

- (a) 100-120 m/s
- (b) 100-120 s/m*
- (c) 100-120 m/min
- (d) 100-120 min/m

89. Detonating fuse consist core of

- (a) PETN*
- (b) TNT
- (c) ASA
- (d) AN

Hint: Detonating fuses, also known as detonating cord or detcord, typically consist of a core made of pentaerythritol tetranitrate (PETN), a high-speed explosive.

90. The VOD of Detonating fuse is ——

- (a) 2000 m/s
- (b) 3200 m/s
- (c) 6000 m/s
- (d) 6500 m/s*

91. The VOD of Nonel is

- (a) 2000 m/s*
- (b) 3200 m/s
- (c) 6000 m/s
- (d) 6500 m/s

92. The detonator used in electrical storms where static electricity is there

- (a) Nonel*
- (b) Raydet
- (c) Ordinary detonator
- (d) none of the above

Hint: "NONEL" refers to a non-electric shock tube detonator used for initiating explosions, commonly in demolition and mining, where it delivers a firing impulse via a hollow plastic tube instead of electric wires, making it safer and more reliable.

93. An instrument to test the continuity of an electric circuit for firing system is

- (a) galvanometer
- (b) exploder
- (c) blastometer*
- (d) ammeter

94. The tool that is used for cleaning and detection of crack in a shot hole is

- (a) crimper
- (b) scraper*
- (c) pricker
- (d) primer

95. The length of shot firing cable in OCP should not be less than ——

- (a) 18 m
- (b) 30 m*
- (c) 40 m
- (d) 50 m

96. Magazine should be away from all building at least —— m

- (a) 50
- (b) 75
- (c) 95*
- (d) 120

97. The hole should terminate —— m below if immediate roof is shale

- (a) 0.3 m*
- (b) 0.2 m
- (c) 0.1 m
- (d) 0.15 m

98. The depth of hole is restricted to 50% - 60% of the width of the drift in

- (a) fan cut
- (b) drag cut
- (c) burn cut
- (d) pyramid cut*

Hint: Pyramid Cut:

This is a type of blasting technique used in mining and tunneling to advance the face of a drift or tunnel.

99. The pattern of cut mostly preferred in tunnels and drifts of small area is

- (a) fan cut
- (b) pyramid cut
- (c) burn cut
- (d) Coromant cut*

Hint: While "Coromant cut" isn't a standard, widely recognized term in tunneling or blasting terminology, the concept of a parallel cut, or burn cut, is commonly used for small tunnels and drifts, providing a square opening for rock expansion.

100. For irregular ore bodies the preferred drilling pattern is

- (a) Ring drilling*
- (b) fan cut
- (c) pyramid cut
- (d) burn cut

Hint: For irregular ore bodies, ring drilling is a preferred drilling pattern, especially in underground mining, where blasts are designed to cover the ore body's extent and prevent freezing of the blast. Ring drilling involves drilling a series of holes in a ring-like pattern within the ore body, typically from sublevel drifts. The drill pattern is designed to cover the entire extent of the ore in the stope (the area being mined)

101. The pattern of cut mostly preferred for laminated strata is

- (a) Ring drilling
- (b) fan cut*
- (c) pyramid cut
- (d) burn cut

Hint: the fan cut drilling pattern is often preferred for laminated strata in underground mining and blasting, especially for narrow drives and small openings, as it's a half-wedge cut that allows for better charge confinement.

102. In general each shot hole in round u/g covers an area of (sq. m)

- (a) 0.1
- (b) 0.1 - 0.2
- (c) 0.3 - 0.5*

- (d) 0.5 - 1

103. The powder factor with solid blasting is (te of coal/kg of explosive)

- (a) 1 - 2
- (b) 1.5 - 2.5*
- (c) 2 - 3
- (d) 2.5 - 3.5

104. In hard rocks the spacing and burden vary from — times the height of the bench

- (a) 0.3-0.4*
- (b) 0.5-0.6
- (c) 0.7-0.8
- (d) 0.9-1

105. While using non incentive delay detonators in BOS the max delay period (milliseconds) btw 1st and last shot in deg 1 and 2 is 'X' and deg 3 is 'Y'. Then X:Y is

- (a) 150:100*
- (b) 100:150
- (c) 200:150
- (d) 150:200

106. The delay period btw 2 consecutive shots with different delay numbers will not exceed

- (a) 50 ms
- (b) 60 ms*
- (c) 70 ms
- (d) 80 ms

107. Relieving hole should be drilled at least — m away from the misfired hole in u/g

- (a) 1
- (b) 0.5,
- (c) 0.3*
- (d) 0.2

108. The VOD of LOX

- (a) 5000 m/s*
- (b) 3500 m/s
- (c) 7000 m/s
- (d) 6000 m/s

109. The explosive charge per hole in BG method

- (a) 2 - 3 kg*
- (b) 1 - 2 kg
- (c) 3 - 4 kg
- (d) 4 - 5 kg

110. The elements in the delay element of short delay detonator

- (a) Antimony and potassium permanganate
- (b) Red lead and silico*
- (c) silicon and Antimony
- (d) none of the above

Hint:

- **Silicon:** Contributes to the delay characteristics of the composition.
- **Barium Sulfate:** Also plays a role in the delay mechanism.
- **Red Lead:** Present in a specific amount (e.g. 3 to 15% by weight)

111. The main element in Fuse head of detonator is

- (a) AN
- (b) DI-nitro glycol
- (c) TNT
- (d) Lead Mono nitro resorcinol*

112. In controlled blasting the fly rock should not go height more than

- (a) 3 m*
- (b) 4 m
- (c) 5 m
- (d) 6 m

113. The PETN booster occupies only — % of the total explosive charge

- (a) 1 - 2*
- (b) 2 - 3
- (c) 3 - 4
- (d) 4 - 5

114. The peak particle velocity should not increased — mm/sec

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

115. The permitted explosive used in u/g in BOS of all gassy mines

- (a) Ajax-G
- (b) Unisax-G
- (c) Soligex*
- (d) Solimax

116. To control the fly rock the blasting technique adopted is

- (a) cushion blasting
- (b) muffled blasting*
- (c) coyote blasting
- (d) pop shooting

Hint: To control flyrock during blasting, muffled blasting, which involves covering or muffling blast holes, is a common and effective technique.

117. To get lumpy coal or to minimize the coal dust the blasting technique adopted is

- (a) cushion blasting*
- (b) muffled blasting
- (c) coyote blasting
- (d) pop shooting

Hint: To achieve lumpy coal and minimize coal dust during blasting, the technique used is cushion blasting, which involves backfilling holes with crushed rock to absorb the shockwave and minimize damage to the final wall, resulting in larger coal pieces and less dust.

118. The current required for the ignition of the fuse head is

- (a) 2 amp
- (b) 1 amp
- (c) 0.5 amp*
- (d) 3.5 amp

119. Safety tests carried out for

- (a) slurry explosive*
- (b) emulsion
- (c) NG
- (d) ANFO

120. If the bedded planes are separated by more than 1.2 m apart then the rocks are said to be

- (a) Massive*
- (b) Bedded
- (c) Flaggy
- (d) rubble

121. The rocks said to be flaggy if the bedded planes are separated by

- (a) more than 1.2 m
- (b) 1 m - 1.2 m
- (c) 75 mm - 1 m
- (d) less than 75 mm*