2.25. The gun powder consists of:
   (a) 75% of sandy earth, saturated with 25% of nitro-glycerine.
   (b) 60% of sandy earth, saturated with 40% of nitro-glycerine.
   (c) 50% of sandy earth, saturated with 50% of nitro-

   glycerine.
   (d) 25% of sandy earth, saturated with 75% of nitro-glycerine.

3.18. Which one of the following sequence of steps is correct for preparing the clay for making bricks?
   (a) Weathering – Blending – Tempering
   (b) Blending – Tempering – Weathering.
   (c) Tempering – Weathering – Blending
   (d) None of these is correct.

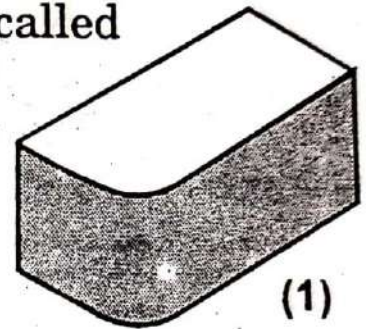3.25. Which one of the following kilns is not a continuous kiln?
   (a) Bull's trench kiln.   (b) Hoffman's kiln.
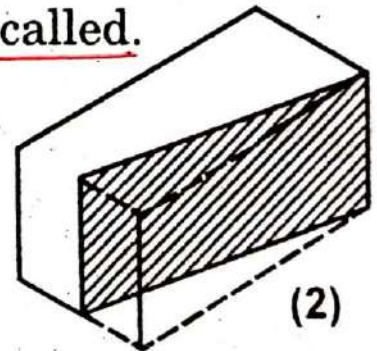   (c) Tunnel's kiln.   (d) Intermittent kiln.

3.33. The brick shown in the figure (1) is called
    (a) saddle brick.
    (b) half round brick.
    (c) bull nose brick.
    (d) chamferred brick.

(1)

3.34. The brick shown in the figure (2) is called.
    (a) A chamferred brick
    (b) A mitred closer
    (c) A saddle leak brick
    (d) A bull nose brick

(2)

5.9. The silica (SiO_2), an important ingredient of cement.
    (a) imparts strength to cement due to formation of di-calcium silicates ($2CaO, SiO_2$) and tricalcium silicates ($3CaO, SiO_2$).
    (b) in excess increases the strength but prolongs the setting time.
    (c) both (a) and (b)   (d) neither (a) nor (b)

5.10. The alumina (Al_2O_3), an ingredient of cement:
    (a) imparts quick setting property to cement

    (b) acts as a flux to lower the clinkering temperature.
    (c) in excess reduces the strength of cement.
    (d) All of these.

5.15. When water is added to cement, the decreasing rate of reaction of the four minerals is as under:

(a) $C_3A \rightarrow C_4AF \rightarrow C_3S \rightarrow C_2S$

(b) $C_4AF \rightarrow C_3S \rightarrow C_2S \rightarrow C_3A$

(c) $C_3S \rightarrow C_2S \rightarrow C_3A \rightarrow C_4AF$

(d) $C_3A \rightarrow C_4AF \rightarrow C_2S \rightarrow C_3S$

7.28. The curved cracks which separate partly one annual ring from the other are called:

(a) Cup shakes   (b) Heart shakes

(c) Ring shakes   (d) Radial shakes

(e) Star shakes

7.34. A good preservate affectively penetrates at least for a depth of

(a) 6 mm to 8 mm   (b) 8 mm to 12 mm

(c) 6 mm to 16 mm   (d) 6 mm to 25 mm

7.42. Which one of the following is refractory timber?

(a) Sal   (b) Teak

(c) Deodar   (d) None of these

12.6. Pick up the in-correct statement from the following:

(a) Separation of course aggregates particles in freshly mixed concrete is known as *segregation*

(b) Separation of water from a freshly mixed mass con- crete is known as *bleeding*.

(c) Segregation and bleeding result in a strong quality concrete

(d) Hardened concrete should be strong, durable and impermeable.

13.22. Which one of the following cements is recommended for the construction of sewage treatment work?

    (a) Extra rapid hardening cement

    (b) Rapid hardening cement

    (c) Ordinary Portland cement

    (d) Sulphate resisting cement

13.47. The quantity of water required for gauging cement for testing cement soundness is taken

    (a) 0.55 P   (b) 0.65 P

    (c) 0.73 P   (d) 0.78 P

14.21. The relation of the modulus of elasticity of aggregates to that of the resulting concrete is:

    (a) linear   (b) parabolic

    (c) cubic parabolic   (d) exponential

12.7. 'Talus' is the soil transported by

    (a) wind   (b) water

    (c) glacier   (d) gravitational force.

12.29. The fundamental equation of air content (a_c), degree of saturation (S_r) and void ratio (e), is

    (a) $a_c = \dfrac{e(1 - S_r)}{1 - e}$ (b) $a_c = \dfrac{e(1 + S_r)}{1 + e}$

    (c) $a_c = \dfrac{e(1 - S_r)}{1 + e}$ (d) $a_c = \dfrac{e^2 (1 - S_r)}{1 + e}$.

12.39. Determination of water content of a soil sample suspected to contain gypsum is made by drying the sample for longer period at a temperature not more than

(a) 60°C

(b) 80°C

(c) 100°C

(d) 110°C.

~~(c) calcium carbide method~~ ~~(d) alcohol method.~~

12.47. If W_1, W_2, W_3 and W_4 are the sequential weights obtained during observations in pycnometer method for determining water content, the formula to be used, is

(a) $W = \left[\left(\dfrac{W_2 + W_1}{W_3 + W_4} \right) \left(\dfrac{G - 1}{G} \right) - 1 \right] \times 100$

(b) $W = \left[\left(\dfrac{W_3 + W_1}{W_3 + W_4} \right) \left(\dfrac{G - 1}{G} + 1 \right) \right] \times 100$

(c) $W = \left[\left(\dfrac{W_2 - W_1}{W_3 - W_4} \right) \left(\dfrac{G - 1}{G} \right) - 1 \right] \times 100$

(d) $W = \left[\left(\dfrac{W_2 - W_1}{W_3 - W_4} \right) \left(\dfrac{G + 1}{G} \right) - 1 \right] \times 100.$

12.54. According to IS : 2720 – 1965, the composition of a dispersing solution used in pipette analysis for determining the size of particles, is

(a) sodium-hexametaphosphate 33 g, sodium carbonate 7 g and distilled water one litre

(b) sodium-hexametaphosphate 7 g, sodium carbonate 33 g and distilled water one litre

(c) sodium-hexametaphosphate 23 g, sodium carbonate 17 g and distilled water one litre

(d) none of these.

12.57. The coefficient of curvature for a well graded soil, must be between

(a) 0.5 to 1.0   (b) 1.0 to 3.0

(c) 3.0 to 4.0   (d) 4.0 to 5.0.

12.95. A phreatic line is defined as the line within a dam section below which there are

(a) positive equipotential lines

(b) positive hydrostatic pressure

(c) negative hydrostatic pressure

(d) negative equipotential lines

(e) none of these.

12.105. Depending upon the properties of a material, the failure envelope may

(a) be either straight or curved

(b) pass through the origin of stress

(c) intersect the shear stress axis

(d) all the above.

12.107. The compression index of a soil

(a) decreases with an increase in the liquid limit

(b) increases with an increase in the liquid limit

(c) decreases with an increase in the plastic limit

(d) is not related with plastic limit.

12.116. The area of cross-section A at failure or during any stage of Triaxial Compression Test and its initial length (L) and volume (V), are related by the equation

(a) $A = \dfrac{V + \Delta V}{L - \Delta L}$ (b) $A = \dfrac{V - \Delta V}{V + \Delta L}$

$$(c)\ A = \frac{V + \Delta V}{L - \Delta L} \qquad\qquad (b)\ A = \frac{V + \Delta V}{L + \Delta L}.$$

4.1. The curvature of the earth's surface, is taken into account only if the extent of survey is more than
    (*a*) 100 sq km
    (*b*) 160 sq km
    (*c*) 200 sq km
    (*d*) 260 sq km.

4.4. Hydrographic surveys deal with the mapping of
    (*a*) large water bodies
    (*b*) heavenly bodies
    (*c*) mountaineous region
    (*d*) canal system
    (*e*) movement of clouds.

4.9. If the smallest division of a vernier is longer than the smallest division of its primary scale, the vernier is known as
    (*a*) direct vernier
    (*b*) double vernier
    (*c*) retrograde vernier
    (*d*) simple vernier.

4.11. On a diagonal scale, it is possible to read up to
    (*a*) one dimension
    (*b*) two dimensions
    (*c*) three dimensions
    (*d*) four dimensions.

4.27. Accidental or compensating errors of length L are proportional to
    (*a*) L
    (*b*) $\sqrt{L}$
    (*c*) $\sqrt[3]{L}$
    (*d*) $\frac{1}{\sqrt{L}}$.

4.13. The conventional sign shown in Fig. 4.1 represents a
- (a) road bridge
- (b) railway bridge
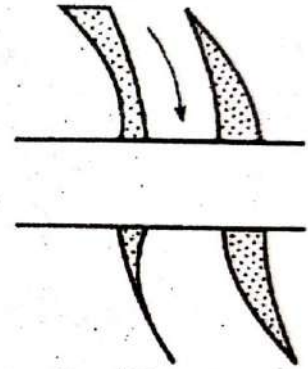- (c) canal bridge
- (d) aquaduct.

Fig. 4.1.

4.15. The conventional sign shown in Fig. 4.2 represents a
- (a) bridge carrying railway below road
- (b) bridge carrying road below railway
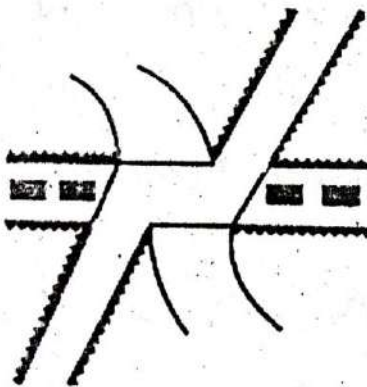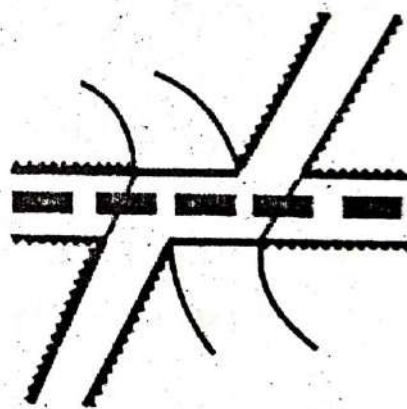- (c) bridge carrying road and railway at the same level

Fig. 4.2.

Fig. 4.3.

- (d) a level crossing.

4.55. An internal focussing type surveying telescope, may be focussed by the movement of
- (a) objective glass of the telescope
- (b) convex-lens in the telescope
- (c) concave lens in the telescope
- (d) plano-convex lens in the telescope.

4.62. The rise and fall method of reduction of levels, provides a check on
  (a) back sights
  (b) fore sights
  (c) intermediate sights
  (d) all of these.

4.66. In reciprocal levelling, the error which is not completely eliminated, is due to
  (a) earth's curvature
  (b) non-adjustment of line of collimation
  (c) refraction
  (d) non-adjustment of the bubble tube.

4.68. Let angular value of one graduation of a tube of length x be ϕ seconds and R be the radius of its internal curved surface, then
  (a) $\phi = \dfrac{x}{206265\ R}$
  (b) $\phi = \dfrac{R}{206265\ x}$
  (c) $\phi = \dfrac{206265}{x.R}$
  (d) $\phi = \dfrac{x.R}{206265}$.

4.74. An imaginary line joining the points of equal elevation on the surface of the earth, represents
  (a) contour surface
  (b) contour gradient
  (c) contour line
  (d) level line
  (e) none of these.

4.75. The boundary of water of a still lake, represents
  (a) level surface
  (b) horizontal surface
  (c) contour line
  (d) a concave surface.

4.78. The representation of general topography of a very flat terrain is possible only
  (a) by drawing contours at large interval
  (b) by drawing contours at small interval

(c) by giving spot levels at large interval

(d) by giving spot levels to salient features at close interval.

4.98. In setting up a plane table at any station

(a) levelling is done first

(b) centering is done first

(c) both levelling and centering are done simultaneously

(d) orientation is done first.