

# Assignment 2

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- 1) Direct step method of gradually varied flow is (CE 2009)
  - a) applicable to non-prismatic channels
  - b) applicable to prismatic channels
  - c) applicable to both prismatic and non-prismatic channels
  - d) not applicable to both prismatic and non-prismatic channels
- 2) The relationship among specific yield ( $S_y$ ), specific retention ( $S_r$ ) and porosity ( $\eta$ ) of an aquifer is (CE 2009)
  - a)  $S_y = S_r + \eta$
  - b)  $S_y = S_r - \eta$
  - c)  $S_y = \eta - S_r$
  - d)  $S_y = S_r + 2\eta$
- 3) The depth of flow in an alluvial channel is  $1.5m$ . If the critical velocity ratio is 1.1 and Manning's  $n$  is 0.018, the critical velocity of the channel as per Kennedy's method is (CE 2009)
  - a)  $0.713m/s$
  - b)  $0.784m/s$
  - c)  $0.879m/s$
  - d)  $1.108m/s$
- 4) The reference pressure used in the determination of sound pressure level is (CE 2009)
  - a)  $20\mu Pa$
  - b)  $20db$
  - c)  $10\mu Pa$
  - d)  $10db$
- 5) Particulate matter (fly ash) carried in effluent gases from the furnaces burning fossil fuels are better removed by (CE 2009)
  - a) Cotton bag house filter
  - b) Electrostatic precipitator (ESP)
  - c) Cyclone
  - d) Wet scrubber
- 6) The value of lateral friction used in the side design of horizontal curve as per Indian Roads Congress guidelines is (CE 2009)
  - a) 0.40
  - b) 0.35
  - c) 0.24
  - d) 0.15
- 7) During a CBR test, the load sustained by a remolded soil specimen at  $5.0mm$  penetration is  $50kg$ . The CBR value of the soil will be (CE 2009)
  - a) 10.0%
  - b) 5.0%
  - c) 3.6%
  - d) 2.4%
- 8) In quadrantal bearing system, bearing of a line varies from (CE 2009)

- a)  $0^\circ$  to  $360^\circ$       b)  $0^\circ$  to  $180^\circ$       c)  $0^\circ$  to  $90^\circ$       d)  $0^\circ N$  to  $90^\circ S$

9) For a scalar function  $f(x, y, z) = x^2 + 3y^2 + 2z^2$ , the directional derivative at the point  $\mathbf{P}(1, 2, -1)$  in the direction of a vector  $\hat{i} - \hat{j} + 2\hat{k}$  is  
(CE 2009)

- a)  $-18$       b)  $-3\sqrt{6}$       c)  $3\sqrt{6}$       d)  $18$

10) The value of the integral  $\int_C \frac{\cos 2\pi z}{(2z-1)(z-3)} dz$  (where  $C$  is a closed curve given by  $|z| = 1$ ) is  
(CE 2009)

- a)  $-\pi i$       b)  $\frac{\pi i}{5}$       c)  $\frac{2\pi i}{5}$       d)  $\pi i$

11) Solution of the differential equation  $3y \frac{dy}{dx} + 2x = 0$  represents a family of  
(CE 2009)

- a) ellipses      b) circles      c) parabolas      d) hyperbolas

12) Laplace transform for the function  $f(x) = \cosh ax$  is  
(CE 2009)

- a)  $\frac{a}{s^2 - a^2}$       b)  $\frac{s}{s^2 - a^2}$       c)  $\frac{a}{s^2 + a^2}$       d)  $\frac{s}{s^2 + a^2}$