Q :) The velocity potential function for a source varies with distance r is

A : $\frac{1}{r}$

B : $\frac{1}{r^2}$

C : C^r

D : in r

Q :) A cylindrical vessel with a constant plane area of 1 m^2 is rotated about its vertical axis such that the liquid inside the vessel is about to spill. If the height of the Vessel is 2 m and the height of the paraboloid is 1 m then the volume (in m^3)of the liquid in the vessel will be

a. 2

b. 1.5

c. 10

d. 0.5

Q :) A streamlined body is defined as a body about which

a.The flow is laminar

b.The flow is along the stream lines

c.The flow separation is suppressed

d.The drag is zero

Q :) One end of a two dimensional water tank has the shape of a quadrant of a circle of radius 2m when the tank is full, the vertical component of the force per unit length on the curved surface will be

a. 250 π kgf

b. 1000 π kgf

c. 4000 kgf

d. 3000 kgf

Q :) The mean velocities at two ends of a stream tube 10 cm apart are 2.5 m/s and 3 m/s the convectional Tangential acceleration mid- way is

a. Zero

b. 0.5 m/s^2

c. 13.75 m/s^2

d. Not determinable

Q :) Which one of the following velocity fields represents A possible fluid flow ?

a. $u = x$; $v = y$

b. $u = x^2$; $v = y^2$

c. $u = xy$; $v = x^2 y^2$

d. $u = x$; $v = -y$

Q :) When a particular discharge is flowing in a horizontal pipe, a mercury-water u-tube manometer connected to the entrance and throat of a penetrometer fitted in the pipe recorded a deflection of 25 cm. if the same discharge flowed through the same pipe kept at an inclination of 45 to the horizontal, then the corresponding deflection by the U-tune manometer will be.

A : $25\sqrt{2}cm$

B : $25/\sqrt{2}cm$

C : 25 / cm

D : 25 cm

Q :) Which of the following rules are used in choosing the repeating variables in dimensional analysis ?

1. repeating variables should include the dependent variables.
2. Repeating variables should contain all primary units used in describing the variables in the problem.
3. Repeating variables should combine among themselves
4. Repeating variables should not contain the dependent variables. Select the correct answer using the code given below.

a. 1 and 2
b. 2 and 3
c. 2 and 4
d. 3 and 4

Q :) A harbour model has a horizontal scale of 1/150 and a vertical scale of 1/60.the interval between successive high tides in the model will be nearly

a. 90 min.

b. 40 min.

c. 15 min.

d. 5 hours

Q :) In a laminar flow through a circular pipe of diameter 20 cm, the maximum velocity is found to be 1 m/s. The velocity at a radial distance of 5 cm from the axis Of the pipe will be

a. 0.25 m/s

b. 0.50 m/s

c. 0.75 m/s

d. 1.0 m/s

Q :) An aeroplane having a wing span of 16 m and chord of 2.5 m weighs 11 tones. If it gets airborne at a velocity of 300 kmph, then the coefficient of lift is nearly

a. 0.0004

b. 0.0006

c. 0.4

d. 0.6

Q :) A discharge of 3.0 m^3 /s flows in a canal,2 m wide, at a depth of 1.2 m. if the width of the canal is reduced to 1.5 m by a canal transition, then neglecting losses, the depth of flow after the contraction will be

a. 1.12 m

b. 1.20 m

c. 1.28 m

d. 1.60 m

Q :) If u and v are the components of velocity in the x and y directions of a flow given by

$u = ax + by$; $v = cx + dy$,

Then the condition to be satisfied is

a. $a + c = 0$

b. $b + d = 0$

c. $a + b + c + d = 0$

d. $a + d = 0$

Q :) A model of reservoir is emptied in 10 minutes. If the Model scale is 1:25, the time taken by the prototype to empty itself, would be

a. 250 minutes

b. 50 minutes

c. 6250 minutes

d. 2 minutes

Q :) At a point a streamline, the velocity is 3 m/s and the radius of curvature is 9 m. if the rate of increase of velocity along the streamline at this point is 1/3 m/s/m, then the total acceleration at this point would be

a. 1 m/s^2

b. M m/s^2

c. 1/3 m/s^2

d. $\sqrt{2}m/s^2$

Q :) In a sutro weir, the rate of flow for all flows above the rectangular base of width W and depth ‘a’ is proportional to the head

a. Above the crest

b. Above the rectangular

c. Above a datum a/3 above the crest

d. 2a/3 Above the crest

Q :) In a compressible flow, the area of flow, the velocity of flow and the mass density are denoted by a, v and m respectively. at a particular section, the differential from of the continuity equation is given by

A : $\frac{da}{a} = \frac{db}{v} + \frac{dm}{m}$

B : $\frac{da}{a} = \frac{dv}{v} - \frac{dm}{m}$

C : $\frac{da}{a} = \frac{dv}{v} = \frac{dm}{m}$

D : $\frac{da}{a} = -\frac{dv}{v} - \frac{dm}{m}$

Q :) Which one of the following is the correct representation of the sequence of surface profiles if the channel slope changes from mild to steep ?

a. M_1 , S_1

b. M_3, S_2

c. M_2, S_3

d. M_2 , S_2

Q :) An error of 0.5% in the measurement of head in a V- notch cause an error of

a. 0.5% in the discharge

b. 1.0% in the discharge

c. 1.25% in the discharge

d. 1.5% in the discharge

Q :) Given $\varphi = 3Xy \; and \; \psi = \frac{3}{2}(Y_2 - X^2)$

The discharge between the streamlines through the Point (1,3)and (3,3) is

a. 2 units

b. 4 units

c. 8 units

d. 12 units

Q :) A model of a weir made to a horizontal scale of 1/40 and vertical scale of 1/9 discharges 1 liters/sec. then the discharge in the prototype is estimated as

a. 1 lps

b. 108 lps

c. 1080 lps

d. 10800 lps

Q :) A sphere of certain diameter, when towed submerged under water, experiences a drag force of 4 newton's at a velocity of 1.5 m/s if another sphere of twice the diameter of the sphere referred to above, is towed with the same velocity in water, the drag force experienced by this sphere will be

a. 8 N

b. 16 N

c. 24 N

d. 32 N

Q :) The ratio of the coefficient of friction drag in laminar boundary layer compared to that in turbulent boundary layer is proportional to

A : $R_L^{1/2}$

B : $R_L^{1/5}$

C : $R_L^{3/10}$

D : $R^{-3/10} \_ L$

Q :) A rectangular open channel carries a discharge of 15 m^3/s when the depth of flow is 1.5 and the bed slope. is 1:1440. what will be the discharge through the channel at the same depth of the slope would have been 1:1000 ?

a. 21.6 m^3/s

b. 18 m^3/s

c. 14.4 m^3/s

d. 12.5 m^3/s

Q :) Match list I (type of turbines) with list II (Ranges of specific speed in MKS units) and select the correct answer using the codes given below the lists.

List – I	List – II
A. Francis	1. 1-35
B. Kaplan	2. 35-60
C. Pelton with one jet	3. 60-300
D. Pelton with two jets	4. 300-1000

Codes:

a. A-3 B-4 C-2 D-1

b. A-4 B-3 C-2 D-1

c. A-3 B-4 C-1 D-2

d. A-4 B-3 C-1 D-2

Q :) A turbine works at 20 m head and 500 rpm speed . its 1.2 scale model to be tested at a head of 20 m should have a rotational speed of nearly

a. 1000 rpm

b. 700 rpm

c. 500 rpm

d. 250 rpm

Q :) Two small orifices A and B of diameters 1 cm and 2 cm respectively, are placed on the sides of tank at depth of h_1 and h_2 below the open liquid surface. If the discharge through A and B are equal, then the ratio of h_1 and h_2 (assuming equal C_d values) will be

a. 16:1

b. 8:1

c. 4:1

d. 2:1

Q :) The coefficient of velocity for an orifice is given by (using usual notations)

A : $\frac{X}{2\sqrt{Y}H}$

B : $\frac{2X}{\sqrt{Y}H}$

C : $\frac{X}{\sqrt{Y}H}$

D : $\frac{\sqrt{X^2}}{2YH}$

Q :) Match list I (name of instrument with List II) (variable measured) and select the correct answer using the codes given below the lists:

List – I	List – II
A. Hot wire anemometer	1. Boundary shear stress
B. Orifice meter	2. Discharge
C. Pitot tube	3. Mean velocity
D. Preston tube	4. Pressure
	5. Turbulence

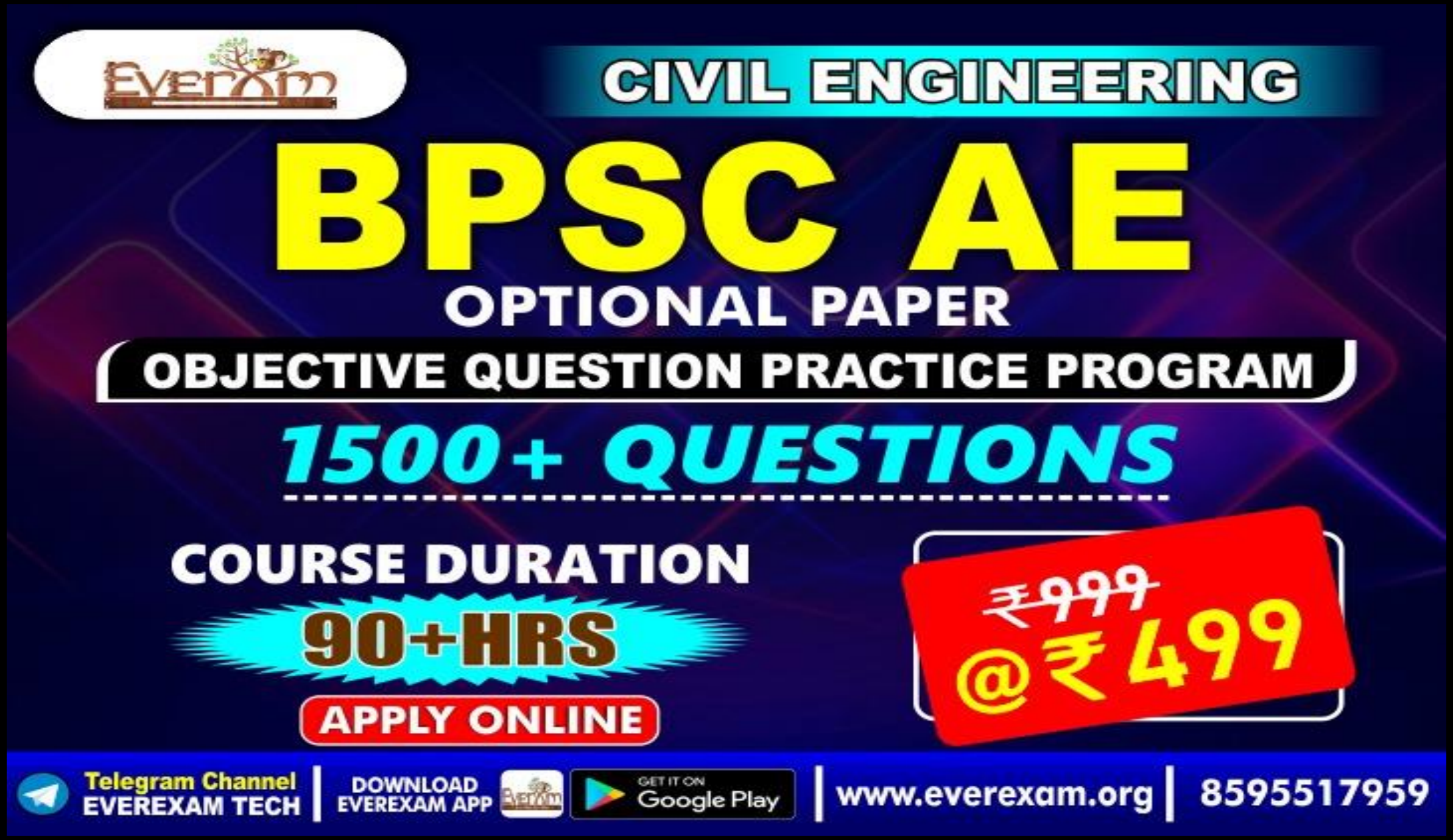
Codes:

a. A-2 B-3 C-4 D-1

b. A-5 B-2 C-3 D-4

c. A-2 B-5 C-1 D-3

d. A-5 B-2 C-3 D-1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