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**Q ) The good clay for making bricks is:**

**A: Unweathered clay**

**B: Weathered clay**

**C: Silted clay**

**D: Black cotton soil**

**Q ) Excess of alumina in the clay:**

**A: Makes the brick brittle and weak**

**B: Makes the brick crack and warp on drying**

**C: Changes colour of the brick from red to yellow**

**D: Improved impermeability and durability of the brick**

**Q ) A first class brick should not absorb water more than of its own dry weight after 24 hours immersion in cold water**

**A: 10%**

**B: 15%**

**C: 20%**

**D: 25%**

**Q ) The durability of concrete is proportional to**

**A: Sand content**

**B: Water cement ratio**

**C: Cement aggregate ratio**

**D: Aggregate water ratio**



**Q ) The purpose of seasoning of timber is to**

**A: Change the direction of grains**

**B: Remove voids**

**C: Reduce moisture content**

**D: Increase moisture content**

**Q ) Group symbols assigned to silty sand and clayey sand are respectively**

**A: SS and CS**

**B: SM and CS**

**C: SM and SC**

**D: MS and CS**



**Q ) A soil mass has coefficients of horizontal and vertical permeability as  $9 \times 10^{-7}$  cm/s and  $4 \times 10^{-7}$  cm/s, respectively. The transformed coefficient of permeability of an equivalent isotropic soil mass is**

**A:  $9 \times 10^{-7}$  cm/s**

**B:  $4 \times 10^{-7}$  cm/s**

**C:  $13 \times 10^{-7}$  cm/s**

**D:  $6 \times 10^{-7}$  cm/s**

**Q ) A 15 cm length of steel rod with relative density of 7.5 is submerged in a two layer fluid. The bottom layer is mercury and the top layer is water. The height of top surface of the rod above the liquid interface (in cm) is**

**A: 8.24**

**B: 7.82**

**C: 7.64**

**D: 7.38**

**Q ) Water flow through a 100 mm diameter pipe with a velocity of 0.015 m/sec. If the kinematic viscosity of water is  $1.13 \times 10^{-6} \text{ m}^2/\text{sec}$ , the friction factor of the pipe material is**

**A: 0.0015**

**B: 0.032**

**C: 0.037**

**D: 0.048**

**Q ) Match list-I (Devices) with List-II (Uses) and select the correct answer codes the given lists:**

<b>List – I</b>	<b>List - II</b>
<b>A. Pitot tube</b>	<b>1. Measuring pressure in pipe</b>
<b>B. Manometer</b>	<b>2. Measuring velocity of flow in a pipe</b>
<b>C. Venturimeter</b>	<b>3. Measuring air and gas velocity</b>
<b>D. Anemometer</b>	<b>4. Measuring discharge in a pipe</b>

**1. A – 1, B – 2, C – 4, D – 3**

**2. A – 2, B – 1, C – 3, D – 4**

**3. A – 2, B – 1, C – 4, D – 3**

**4. A – 4, B – 1, C – 3, D – 2**

**Q ) Which of the following statement is correct regarding impulse turbine?**

**A: Always operates submerged**

**B: Makes use draft tube**

**C: Operates by initial complete conversion to kinetic energy**

**D: Converts pressure head into velocity head throughout the vanes**

**Q ) A hydraulic turbine has a discharge  $5\text{m}^3/\text{sec}$ , when operating under a head of 20 m with a speed of 500 rpm. It is to operate under a head of 15 m. for the same discharge, the rotational speed in rpm will approximately by**

**A: 433**

**B: 403**

**C: 627**

**D: 388**

**Q ) Identify the false statement from the following the specific speed of the pump increases with the specific speed of the pump increases with**

**A: Increase in shaft speed**

**B: Increase in discharge**

**C: Decrease in gravitational acceleration**

**D: Increase in head**



**Q ) The maximum value of poisson's ratio for an elastic material is:**

**A: 0.25**

**B: 0.5**

**C: 0.75**

**D: 0.1**

**Q ) A metal bar of length 100 mm is inserted between two rigid supports and its temperature is increased by  $10^0$  C. If the coefficient of thermal expansion is  $8 \times 10^{-6}$  per  $^0$ C and the young's modulus is  $1.5 \times 10^5$  Mpa, the stress in the bar is:**

**A: Zero**

**B: 12 MPa**

**C: 24 MPa**

**D: 2400 MPa**

**Q ) Endurance limit is**

**A: The maximum stress a material can sustain for very long time**

**B: The maximum stress a material can take under direct loading**

**C: The maximum bending stress the material can take**

**D: The maximum stress at which even a billion reversal of stress cannot failure of the material**

**Q ) The point where the bending moment is zero is called as**

**A: Point of contraflexure**

**B: Yield point**

**C: Plastic hinge**

**D: Limit of elasticity**

**Q ) The maximum bending stress induced in a steel wire of modulus of elasticity  $100 \text{ kN/mm}^2$  and diameter  $2 \text{ mm}$  when bound on a drum of diameter  $2 \text{ m}$  is approximately equal to**

**A:  $50 \text{ N/mm}^2$**

**B:  $100 \text{ N/mm}^2$**

**C:  $200 \text{ N/mm}^2$**

**D:  $400 \text{ N/mm}^2$**

**Q ) Mohr's circle of the state of stress defined by**

**$\begin{bmatrix} 30 & 0 \\ 0 & 30 \end{bmatrix}$  MPa is a circle with**

**A: Center at (0,0) and radius 30 MPa**

**B: Center at (0,0) and radius 60 MPa**

**C: Center at (30, 0) and radius 30 MPa**

**D: Center at (30, 0) and zero radius**

**Q ) A solid circular shaft of diameter  $d$  and length  $L$  is fixed at one end and free at the other end. A torque  $T$  is applied at the free end. The shear modulus of the material is  $G$ , the angle of twist at the free end is**

**A:  $16 TL/\pi d^4 G$**

**B:  $32 TL/\pi d^4 G$**

**C:  $64 TL/\pi d^4 G$**

**D:  $128 TL/\pi d^4 G$**



**Q ) Isopleths are lines on a map through points having equal depth of**

**A: Rainfall**

**B: Infiltration**

**C: Evapotranspiration**

**D: Total run off**

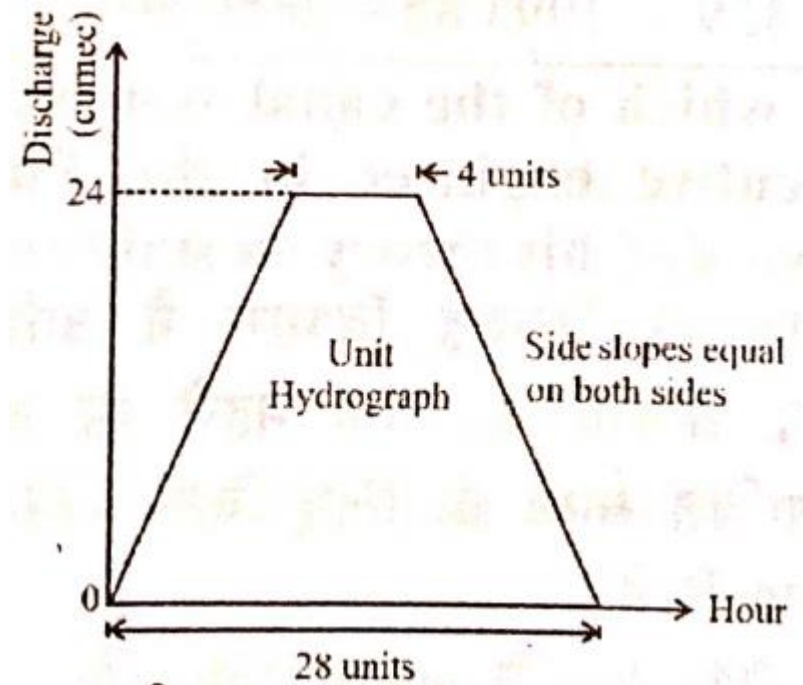
Q ) A 2-hour unit hydrograph can be approximated as trapezoidal as shown in figure. The unit hydrograph refers to catchment of area

A:  $138.24 \text{ km}^2$

B:  $0.0384 \text{ km}^2$

C:  $384 \text{ m}^2$

D:  $3840 \text{ m}^2$



**Q ) A canal was designed to supply the irrigation needs for 1200 hectares of land growing rice of 140 days base period having a delta of 134 cm. If this canal water is used to irrigate wheat of base period 120 days a delta of 52 cm, the area (in hectares) that can be irrigated is**

**A: 2650**

**B: 3608**

**C: 543**

**D: 1730**

**Q ) On which of the canal system R.G. Kennedy, executive engineer in the Punjab irrigation proposing his theory on stable channels**

**A: Krishna western delta canals**

**B: Lower Bari doab canals**

**C: Lower chenab canals**

**D; Upper Bari doab canals**

**Q ) The live storage requirement for a reservoir is to be determined by**

**A: Topographical survey**

**B: Annual demand**

**C: Double mass curve analysis**

**D: Mass curve analysis**

**Q ) In reservoir with an uncontrolled spillway, the peak of the plotted outflow hydrograph**

**A: Lies outside the plotted inflow hydrograph**

**B: Lies on the recession limb of the plotted inflow hydrograph**

**C: Lies on peak the inflow hydrograph**

**D: Is higher than the peak of the plotted inflow hydrograph**

**Q ) The standard project flood is**

**A: Same as the probable maximum flood**

**B: Same as the design flood**

**C: Smaller than the probable maximum flood**

**D: Larger than the probable maximum flood by a factor  
implying safety factor**



**Q ) A linear reservoir is one in which**

**A: Storage varies linearly with time**

**B: Storage varies linearly with outflow rate**

**C: Storage varies linearly with inflow rate**

**D: Storage varies linearly with elevation**

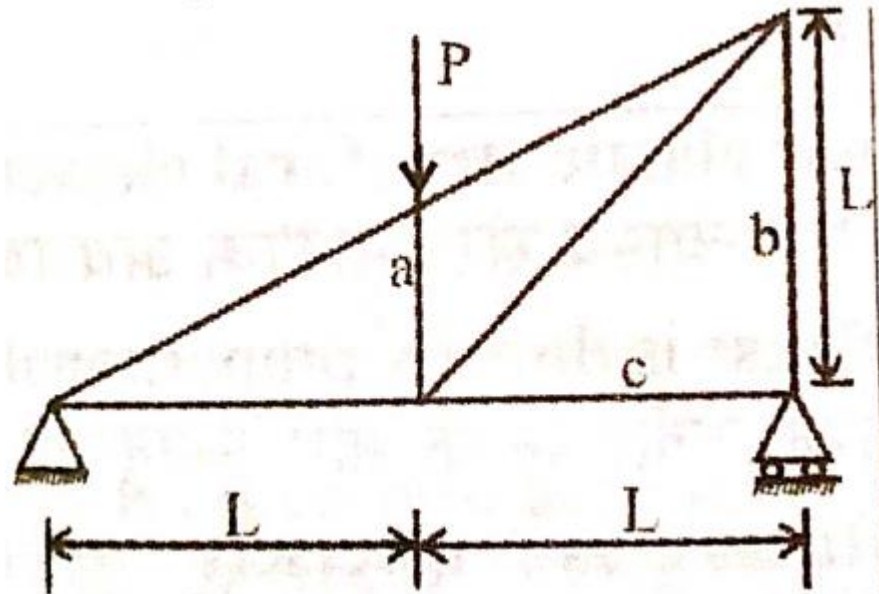
**Q ) The force in members a, b, c in truss as shown in the figure are, respectively**

**A:  $P, P/2, 0$**

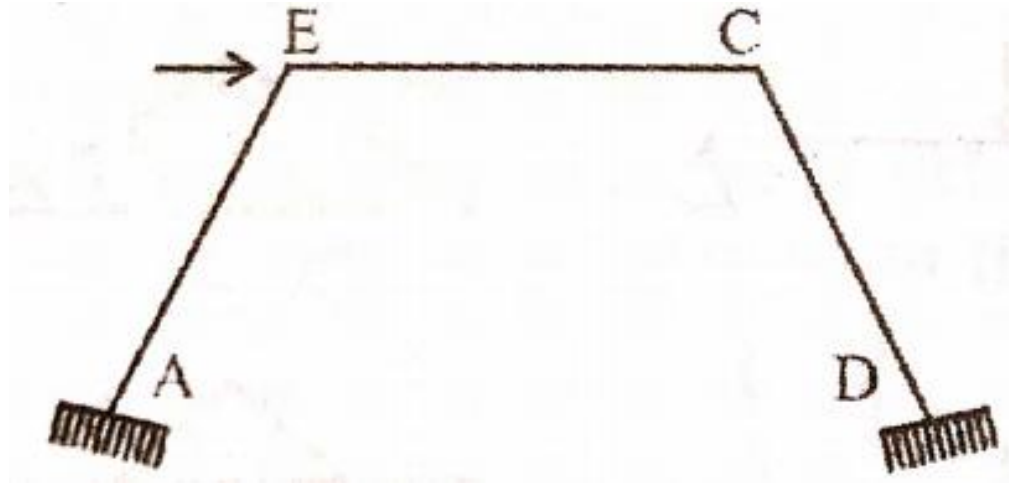
**B:  $P/2, P, 0$**

**C:  $P, P, P$**

**D:  $P/2, P/2, 0$**



**Q ) The kinematic indeterminacy of the plane frame shown in figure is (disregarding the axial deformation of the members)**



**A: 4**

**B: 3**

**C: 2**

**D: 0**

**Q ) Science & Technology Resource Centre (STRC) for farmer training is located at which of the following places in Rajasthan?**

**A: Neemrana, Alwar**

**B: Motigarh, Bikaner**

**C: Lohawat, Jodhpur**

**D: Kanpura, Ajmer**

**Q ) Which of the following rivers is in the border of Rajasthan and Madhya Pradesh?**

**A: Banas**

**B: Chambal**

**C: Luni**

**D: Kali**

**Q ) Hawa mahal was built by Maharaja sawai Pratap singh in which year?**

**A: 1354**

**B: 1868**

**C: 1729**

**D: 1799**

**Q ) Which of the following districts are located in western sandy plains of Rajasthan?**

**A: Bikaner**

**B: Jaipur**

**C: Kota**

**D: Udaipur**





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