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Q : 1) The maximum allowable Los angeles abrasion value for high quality surface course is

A : 50%

B : 30%

C : 25%

D : 80%

Q : 2) A simple field test carried out to determine deterioration of stones when immersed in water is known as

A : Absorption test

B : Moh’s hardness test

C : Toughness test

D : Smith’s test

Q : 3) As per Moh's scale the hardness of quartz and topaz respectively are

A : 7 & 8

B : 8 & 7

C : 9 & 10

D : 10 & 9

Q : 4) For a aggregate to be called cyclopean aggregate its size must be larger than :

A : 75 mm

B : 35 mm

C : 55 mm

D : 60 mm

Q : 5) Which component has highest percentage in good brick earth

A : Alumina

B : Lime

C : Silica

D : Oxide of iron

Q : 6) Excess of silica in brick earth results in

A : Very heavy brick

B : Loss of cohesion

C : Very light brick

D : None of these

Q : 7) The compressive strength of heavy duty bricks should be more than-

A : 40 N/mm^2

B : 20 N/mm^2

C : 5 N/mm^2

D : 3.5 N/mm^2

Q : 8) Which of the following steps in the manufacturing bricks is carried out in pug mill?

A : Digging

B : Cleaning

C : Weathering

D : Tempering

Q : 9) Tolerance limits for dimensions of bricks in length, width and height, respectively, for a sample of 20 bricks taken together as per IS code are:

A : 2000 mm, 90 mm, 90 mm

B : 80 mm, 40 mm, 40 mm

C : 100 mm, 95 mm, 95 mm

D : 50 mm, 20 mm, 20 mm

Q : 10) When the deposit of efflorescence is more than 10% but less than 50% of the exposed area of the brick, the presence of efflorescence is:

A : Moderate

B : Slight

C : Heavy

D : Serious

Q : 11) Consider the following statements about lime

1. Calcination of limestone results in quick lime
2. Lime produced from pure variety of chalk is hydraulic lime
3. Hydrated lime is obtained by treating quick lime with water.

Which of the above statements are correct?

A : 1, 2 and 3

B : 1 and 2 only

C : 2 and 3 only

D : 1 and 3 only

Q : 12) If the Na_2O and K_2O content in a given cement is 1.0% and 0.5%, the total alkali content in the cement in terms of Equivalent Na_2O can be taken as _____.

A : 1.5%

B : 1.1%

C : 1.3%

D : 1.0%

Q : 13) The addition of Pozzolana to Portland cement may cause-

A : Decrease in early strength

B : Increased in early strength

C : Decrease in curing time

D : Increase in permeability

Q : 14) During cement manufacturing, when clinkers are formed, kiln temperature approximately is

A : 1200°C

B : 1800°C

C : 1600°C

D : 1300°C

Q : 15) The role of super plasticizer in a cement paste is to

A : Disperse the particle

B : Disperse the particles and to remove air bubbles

C : Disperse the particles, remove air bubbles and to retard setting

D : Retard setting

Q : 16) Loss on ignition in Portland cement shall not be greater than :

A : 4%

B : 5%

C : 6%

D : 3.5%

Q : 17) The percentage of the slag component of Portland-slag cement varies from

A : 10 to 40%

B : 40 to 70%

C : 70 to 80%

D : 80 to 90%

Q : 18) The percentage of the residue left after sieving good portland cement in 90 micron sieve should not exceed.

A : 50%

B : 10%

C : 20%

D : 30%

Q : 19) Consider the following statements:

1. Hydrophobic cement grains possesses low wetting ability
2. Rapid hardening cement is useful in concreting under static, or running water
3. Quick setting cement helps concrete to attain high strength in the initial period
4. White cement is just a variety of ordinary cement free of colouring oxides

Which of the above statements are correct?

A : 1 and 4 only

B : 1 and 3 only

C : 2 and 4 only

D : 2 and 3 only

Q : 20) Initial setting cement is caused due to

A : 3 CaO. SiO_2

B : 2 CaO. SiO_2

C : 3 CaO. Al_2O_3

D : 4 CaO.Al_2O_3.Fe_2O_3

Q : 21) For foundation on clayey soil, the maximum differential settlement is limited

A : 20 mm

B : 30 mm

C : 40 mm

D : 50 mm

Q : 22) Which of the following is not an assumption in terzaghi's formulation of bearing capacity equation?

A : Plain strain condition exists

B : Base of the footing is smooth

C : The width of the base of the footing is less than or equal to the founding depth

D : Shear strength is governed by mohr coulomb failure criteria

Q : 23) The net ultimate bearing capacity of a purely cohesive soil

A : Depends on the width of the footing and is independent of the depth of the footing

B : Depends on the width as well as the depth of the footing

C : Depends on the depth but is independent of the width of the footing

D L Is independent of both the width and depth of the footing

Q : 24) The weight of the hammer used in the standard penetration test is :

A : 50 kg

B : 60 kg

C : 65 kg

D : 75 kg

Q : 25) In a plate load test on a sandy soil, the test plate of 60 cm × 60 cm undergoes a settlement of 5 mm at a pressure of 12×10^4 N/m^2. What will be the expected settlement of 3 m × 3 m footing under the same pressure?

A : 9 mm

B : 15 mm

C : 20 mm

D : 25 mm

Q : 26) For determining the ultimate bearing capacity of soil, the recommended size of a square bearing plate to be used in plate load test should be 30 to 75 cm square with a minimum thickness of

A : 10 mm

B : 16 mm

C : 25 mm

D : 32 mm

Q : 27) Contact pressure for a rigid footing resting on clay at the edge and the centre are _____ and _____, respectively.

A : Zero; maximum

B : Minimum; maximum

C : Maximum; minimum

D : Maximum; zero

Q : 28) Two footings, one circular and the other square, are found on the surface of a purely cohesion less soil. Diameter of the circular footing and width of square footing is the same. Ratio of ultimate bearing capacity of circular to square footing is

A : 1.00

B : 1.20

C : 0.75

D : 1.33

Q : 29) For a proposed building, raft foundation, isolated footings and combined footings are being considered. These foundations are to be listed in the decreasing order of preference in terms of performance. Which one of the following is the correct order of listing?

A : Raft foundation – Combined footings – Isolated footings

B : Isolated footings – raft foundation – Combined footings

C : Combined footings – Raft foundation – Isolated footings

D : Combined footings – Isolated footings – Raft foundation

Q : 30) The two criteria for determining of allowable bearing capacity of foundation are:

A : Shear failure and settlement

B : Bond failure and shear failure

C : Tensile failure an settlement

D : tensile failure and compression failure

Q : 31) Statement A : plate load test is a short duration test and is not suitable in cohesive soils.

Statement B : Plate load test does not record the total statement of the test plate in clayey soils

A : Both the statements A and B ar etrue but B is not the correct eplanantion of A

B : Statement A is true but B is false

C : Statement A is false but B is true

D : Both the statements A and B are true and B is the correct explanation of A

Q : 32) A group of nine piles 12 mm long and 250 mm in diameter is arranged in a square form in clay having undrained shear strength of 30 kN/m^2, Neglecting bearing a top of the piles and taking adhesion factor as 0.9, ultimate capacity of all piles in individual action is:

A : 2045 kN

B : 2290 kN

C : 2545 kN

D : 2690 kN

Q : 33) A raft foundation of 6 m × 9 m is placed at a depth of 3 m in a cohesive soil having c = 120 kN/m^2. The net ultimate bearing capacity of the soil using Terzaghi's theory will be:

A : 820 kN/m^2

B : 1020 kN/m^2

C : 1220 kN/m^2

D : 1420 kN/m^2

Q : 34) The type of foundation suitable for under water structures is

A : Cast in situ concrete piles

B : Pier foundation

C : Continuous footing

D : Stepped foundation

Q : 35) The net intensity of loading which the foundation will carry without undergoing settlement in excess or the permissible value for the structure under consideration but not exceeding net safe bearing capacity is termed as:

A : Net loading intensity

B : Ultimate bearing capacity

C : Safe bearing capacity

D : Allowable bearing capacity

Q : 36) Arrange the bearing capacities of shallow foundation in descending order (from highest to lowest)-

(i) Ultimate bearing capacity

(ii) Net ultimate bearing capacity

(iii) Net safe bearing capacity

(iv) Gross safe bearing capacity

A : (i), (ii), (iv), (iii)

B : (i), (ii), (iii), (iv)

C : (ii), (i), (iii), (iv)

D : (ii), (i), (iv), (iii)

Q : 37) Inverted arch footing is more suitable for

A : Residential buildings

B : Bridges

C : Single storey buildings

D : Light wave

Q : 38) Local shear failure occurs at strains

A : More than 10%

B : Less than 10%

C : Between 5% to 10%

D : More than 90%

Q : 39) Which of the following is not considered in the design of the isolated footings?

A : Bending moment

B : Shear

C : Punching stress

D : Torsion

Q : 40) The cyclic plate load test in soils can be adopted to determine the

A : Consolidation characteristics of soils

B : Dynamic shear modulus of the soil

C : Permeability characteristics of the soil

D : None of the above

Q : 41) If a material is heated up, its elastic modulus

A : Decreases

B : Increases

C : Remains constant

D : None of the above

Q : 42) Pressure meter test is used for the determination of_____

A : Poisson's ratio

B : Shear modulus

C : Bulk modulus

D : Young's modulus

Q : 43) The ratio of modulus of rigidity and modulus of elasticity (G/E) for any elastic isotropic material is:

A : Less than $\frac{1}{2}$

B : Less than $\frac{1}{3}$

C : More than $\frac{1}{3}$

D : Both (a) and (c)

Q : 44) The maximum stress that can be applied to a material for an infinite number of cycles of repeated stress without causing failure is called

A : Elastic limit

B : Proportional limit

C : Ultimate strength

D : Endurance limit

Q : 45) In case of brittle materials, the ratio of ultimate compressive stress to ultimate tensile stress is-

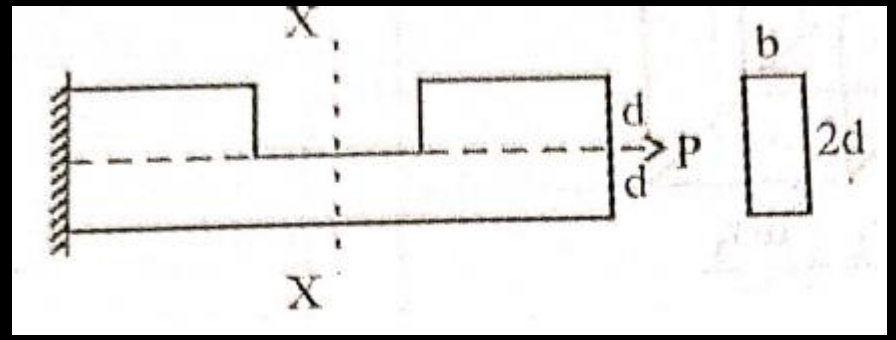
A : Equal to 1

B : More than 1

C : Less than 1

D : May be anything no definite relation exists

Q : 46) Determine the maximum tensile stress at the section XX in the figure below:



A : 2P/bd

B : 4P/bd

C : 6P/bd

D : 8P/bd

Q : 47) The deformation of a vertically held bar of length L and cross-section A is due to its self weight only. If young's modulus is E and the unit weight of the bar is γ, the elongation dL is

A : $\frac{\gamma L^3}{2E}$

B : $\frac{EL^3}{2\gamma}$

C : $\frac{\gamma L^2}{2E}$

D : $\frac{\gamma L^2}{2AE}$

Q : 48) A mild steel bar, circular in cross section, tapers from 40 mm diameter to 20 mm diameter over its length of 800 mm. It Is subjected to an axial pull of 20 kN. $E = 2 \times 10^5$ N/mm^2. The increase in the length of the rod will be

A : $\frac{1}{10\pi}$mm

B : $\frac{2}{5\pi}$mm

C : $\frac{4}{5\pi}$mm

D : $\frac{1}{5\pi}$mm

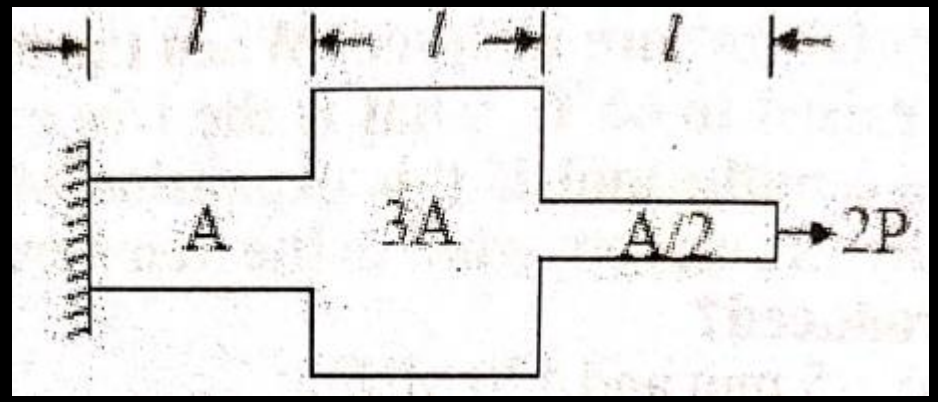
Q : 49) The total elongation of the structural element (fixed at one end, free at the other end, and of varying cross-section) as shown in the figure, when subjected to load 2P at the free end is

A : 6.66 $\frac{P\ell}{AE}$

B : 5.55 $\frac{P\ell}{AE}$

C : 4.44 $\frac{P\ell}{AE}$

D : 3.33 $\frac{P\ell}{AE}$



Q : 50) The property of a material by which it can be beaten or rolled into thin plates, is called

A : Malleability

B : Ductility

C : Plasticity

D : Elasticity

Q : 51) Upper yielding point in a stress-strain curve of structural steel can be avoided by

A : Cold working

B : Hot working

C : Quenching

D : Galvanizing

Q : 52) Modulus of toughness is the area of the stress strain diagram upto

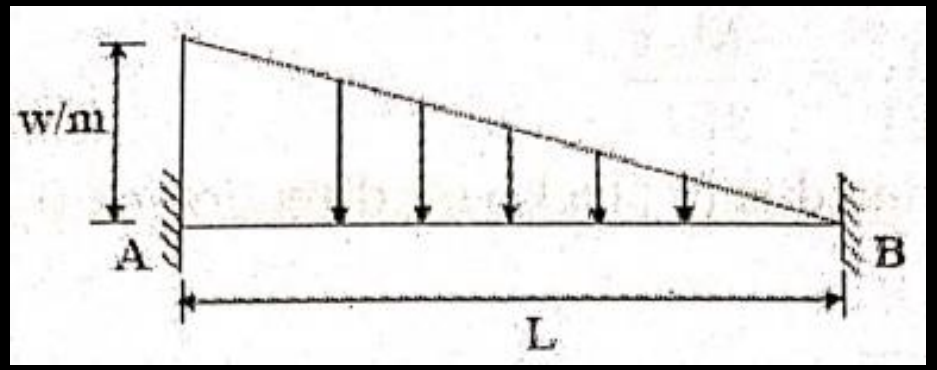
A : Rupture point

B : Yield point

C : Limit of proportionality

D : Ultimate point

Q : 53) A fixed beam is loaded as in figure. The fixed end moment at support A is



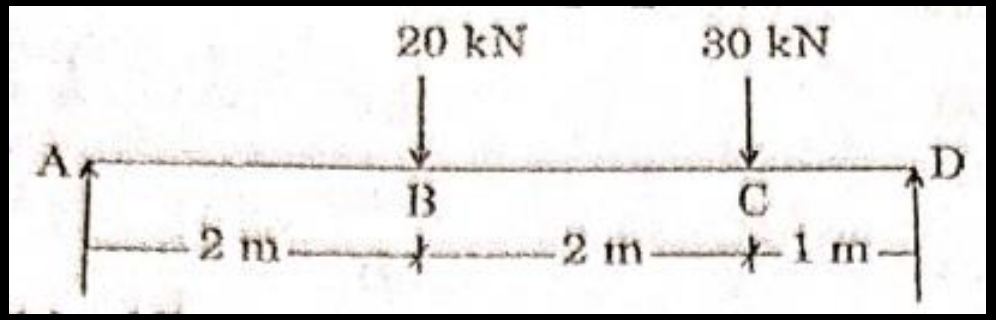
A : $\frac{wL^2}{30}$

B : $\frac{wL^2}{20}$

C : $\frac{wL^2}{10}$

D : $\frac{wL^2}{8}$

Q : 54) Which part of the beam is subjected to pure bending in the following figure?



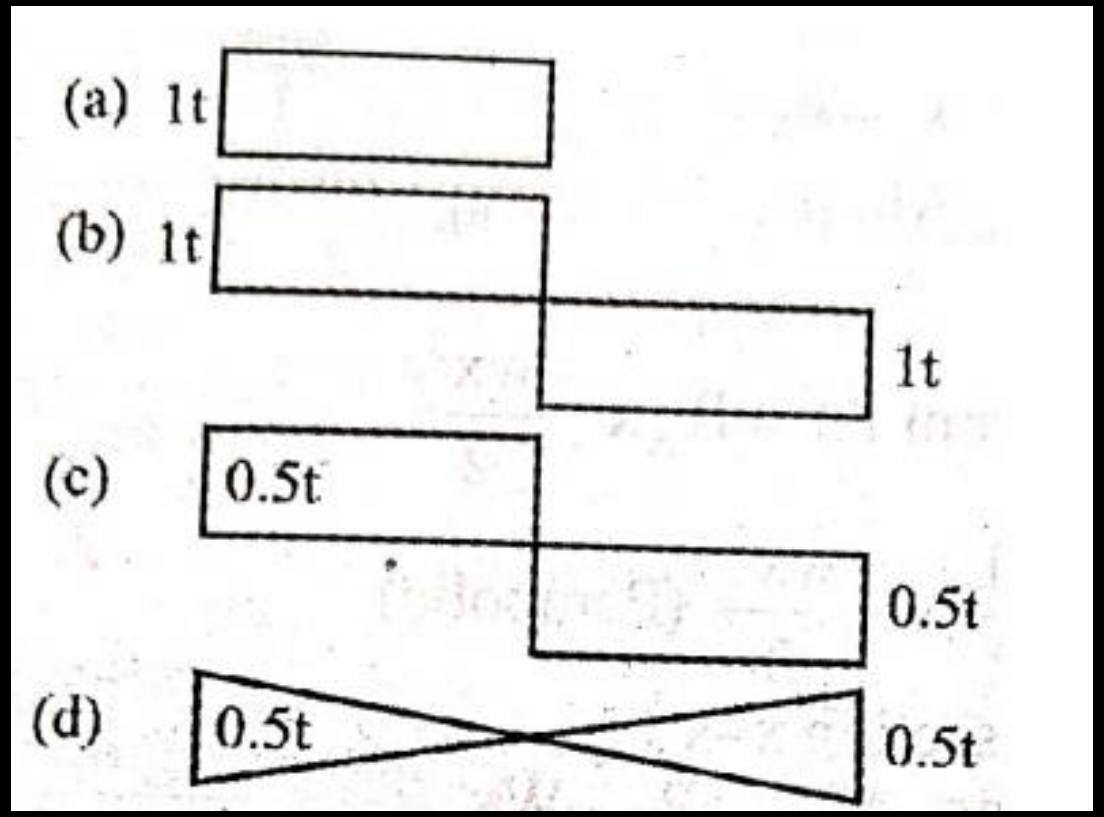
A : AB

B : BC

C : CD

D : No part of bam is subjected to pure bending

Q : 55) The shear force diagram (SFD) for the beam shown in figure is



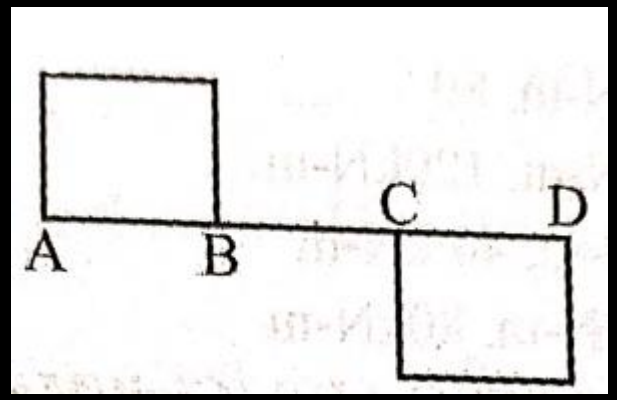
Q : 56) The given figure shows the shear force diagram for the beam ABCD. Bending moment in the portion BC of the beam

A : Is zero

B : Varies linearly from B to C

C : Parabolic variation between B and C

D : Is a non-zero constant



Q : 57) The maximum bending stress induced in a steel wire of modulus of elasticity 100 kN/mm^2 and diameter 2 mm when would on a drum of diameter 2 m is approximately equal to

A : 50 N/mm^2

B : 100 N/mm^2

C : 200 N/mm^2

D : 400 N/mm^2

Q : 58) The maximum shear stress across a circular section is

A : $\left(\frac{4}{3}\right)$ Average shear stress

B : $\left(\frac{3}{2}\right)$ Average shear stress

C : $\left(\frac{5}{4}\right)$ Average shear stress

D : $\left(\frac{9}{5}\right)$ Average shear stress

Q : 59) In which of the following cases, there exists the situation of pure bending in some part of the beam or along the entire beam?

(i) A simply supported beam subjected to two equally spaced downward concentrated loads

(ii) A simply supported beam subjected to two equally spaced opposite moments

(iii) A cantilever beam subjected to clockwise moment at free end

(iv) An overhanging beam with both side equal overhangs subjected to different concentrated loads at both the free ends

A : (i) and (iv)

B : (i), (ii) and (iv)

C : (i), (ii) and (iii)

D : (i) and (iii)

Q : 60) Which one of the following statements specifies shear flow?

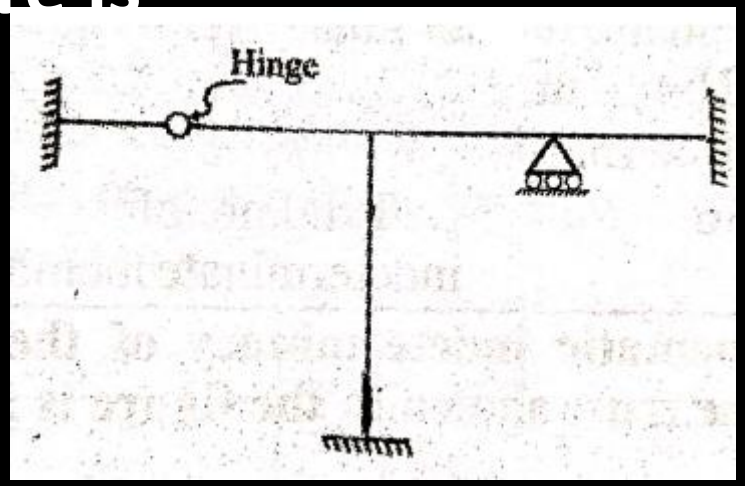
A : Flow of shear force along the beam

B : It is the product of the shear stress at any level and the corresponding width b of the section

C : Unbalanced force on any side of given section divided by area of section

D : The deformation at any level due to sudden variation in shear stress

Q : 61) The degree of static indeterminacy of the frame shown in the following figure is



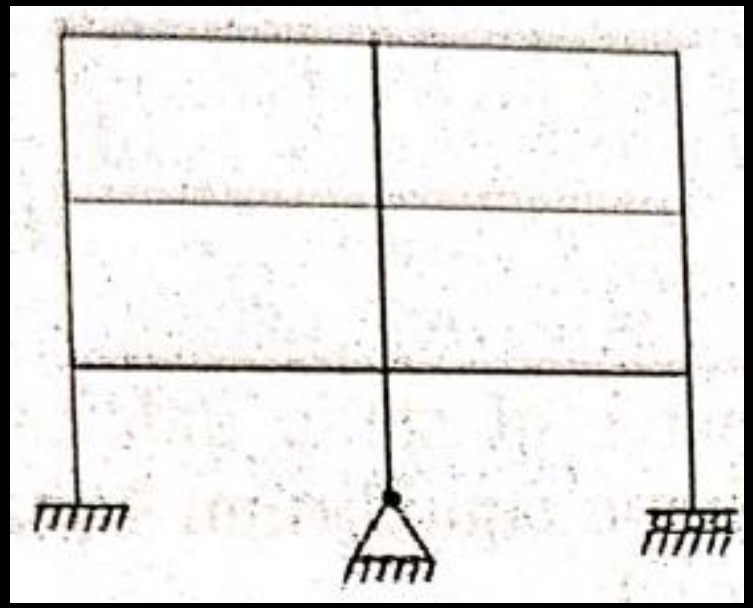
A : 2

B : 4

C : 6

D : 8

Q : 62) The kinetic indeterminacy of the structure shown in the figure is equal to



A : 14

B : 15

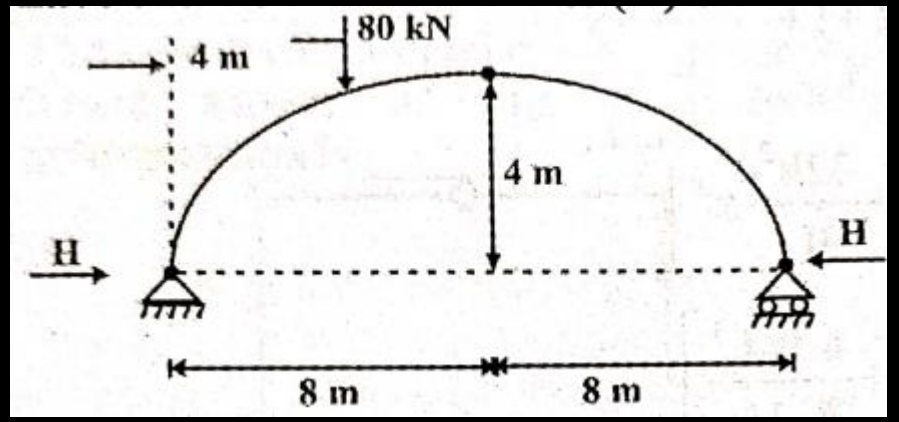
C : 16

D : 17

Q : 63) A three-hinged parabolic arch of span 16 m and rise 4 m is subjected to a vertical downward concentrated load of 80 kN quarter span. The horizontal reaction at A will be

OR

The three hinged arch shown in figure will have the horizontal thrust (H) of



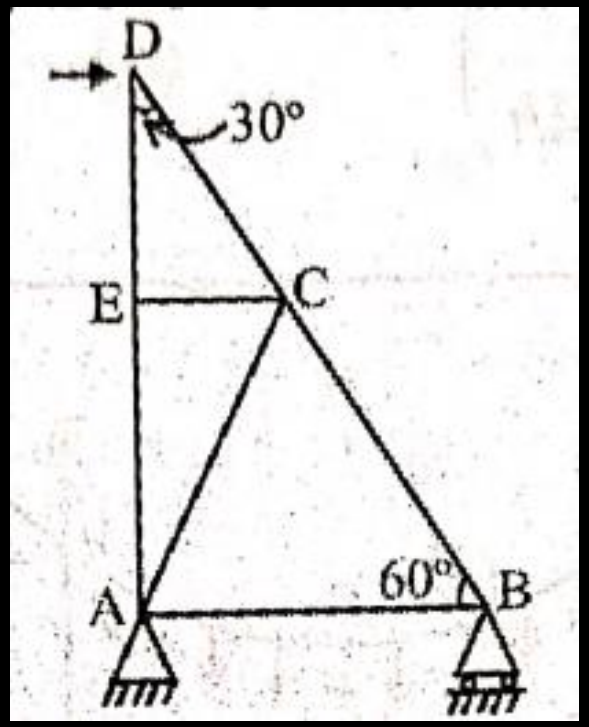
A : 20 kN

B : 30 kN

C : 40 kN

D : 50 kN

Q : 64) Member(s) n of the frame shown below which carries/carry zero forces is/are:



A : EC only

B : BC and AB

C : EC and AC

D : EC, AC and AB

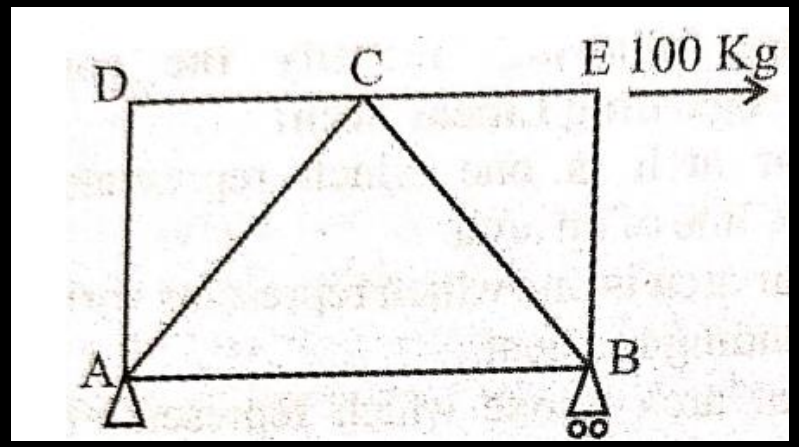
Q : 65) Identify the members with zero member force in the following truss:

A : AD, DC and EB

B : AD, DC and CE

C : AD, AB and AC

D : None of the above



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