



**P.E.S. College of Engineering, Mandya - 571 401**

(An Autonomous Institution affiliated to VTU, Belagavi)

**Fifth Semester, B.E. - Civil Engineering**

**Semester End Examination; February / March - 2022**

**Proficiency in Civil Engineering (Technical Skills - I)**

Time: 2 hrs

Max. Marks: 50

**Course Outcomes**

The Students will be able to:

CO1: Understand the principles and analysis of elements in structural engineering.

CO2: Understand the principles and application of Water Resources Engineering.

CO3: Understand the principles and usage of Geomatics engineering and Transportation Engineering.

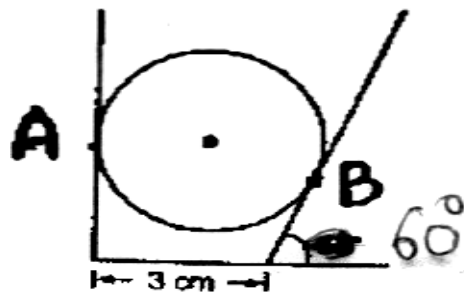
CO4: Understand the principles and perceive Construction Management.

**Note: All questions are compulsory and each question carries TWO marks.**

Q. No.	Questions	Marks	BLs	COs	POs
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1. A smooth sphere of weight 2 kN and 20 mm radius is resting against the walls as shown in fig. Determine the reaction at the supporting Point R<sub>A</sub>.

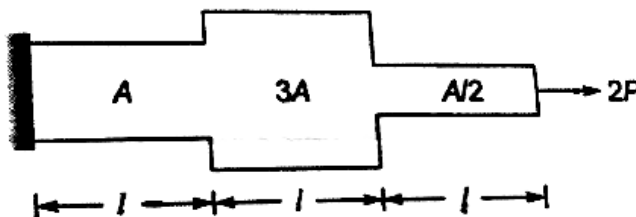
- a)  $3\sqrt{3}KN$       b)  $4\sqrt{3}KN$       c)  $2\sqrt{3}KN$       d)  $5\sqrt{3}KN$



2      3      CO1 PO1

2. 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 fig.. when subjected to load 2P at the free end is,

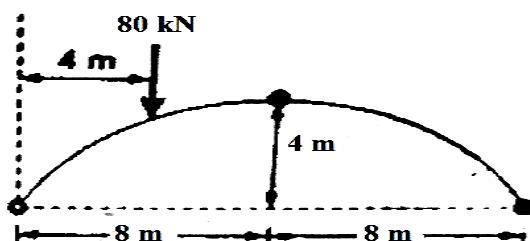
- a)  $6.66 PI/AE$       b)  $5.55 PI/AE$       c)  $4.44 PI/AE$       d)  $3.33 PI/AE$



2      3      CO1 PO1

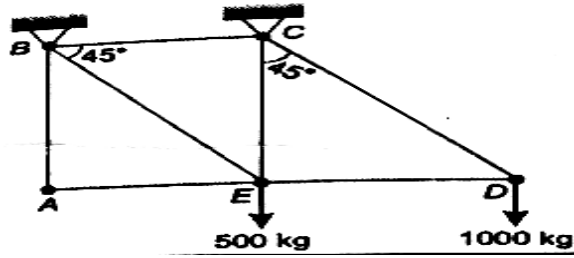
3. The three hinged arch as shown in the fig. given below will have the value of horizontal reaction as,

- a) 20 KN      b) 30 KN      c) 40 KN      d) 50 KN



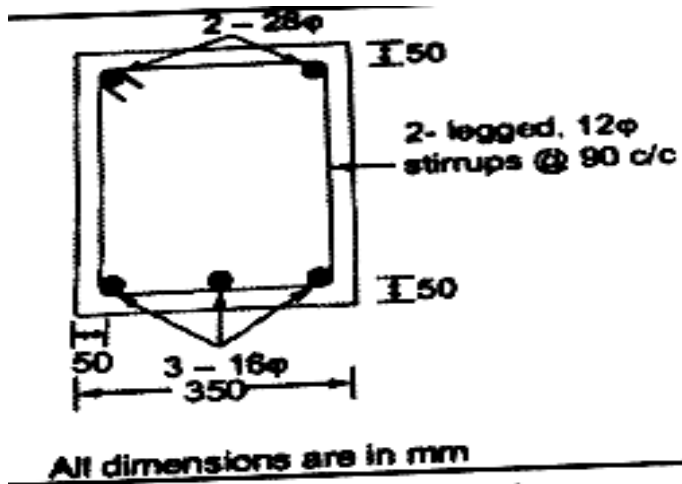
2      3      CO1 PO1

4. The cantilever frame shown in the given fig. is supported by vertical links at B and C and carries loads as shown. The force in the bar AE is,  
 a) 500 Kg                      b) 1000 Kg                      c) Zero                      d) 2500 Kg



2                      3                      CO1 PO1

5. The mix design of pavement concrete is based on the  
 a) Characteristic compressive strength                      b) Shear strength                      2                      3                      CO1 PO1  
 c) Flexural strength                      d) Bond Strength
6. In the reinforced beam section shown in the figure (not drawn to scale) the nominal cover provided at the bottom of the beam as per IS456-2000, is  
 a) 30 mm                      b) 50 mm                      c) 42 mm                      d) 36 mm



2                      L3                      CO2 PO2

7. As per Indian standards for bricks, minimum acceptable compressive strength of any class of burnt clay bricks in dry state is.....  
 a) 10.0 MPa                      b) 3.5 MPa                      c) 0.75 MPa                      d) 5.0 MPa                      2                      L1                      CO4 PO1
8. A concrete beam of rectangular cross section of 200 mm×400 mm is prestressed with a force of 400 kN at eccentricity 100 mm. The maximum compressive stress in the concrete is \_\_\_\_\_  
 a) 12.5 N/mm<sup>2</sup>                      b) 7.5 N/mm<sup>2</sup>                      c) 5.0 N/mm<sup>2</sup>                      d) 2.5 N/mm<sup>2</sup>                      2                      L1                      CO1 PO1
9. Shear stress in the Newtonian fluid is proportional to.....  
 a) Pressure                      b) Strain                      c) Strain rate                      d) Inverse of viscosity                      2                      L1                      CO2 PO1
10. A right angled triangular notch is used to measure the flow in a flume. In the head measured is 200mm and C<sub>d</sub>=0.62, neglecting velocity of approach, the discharge is.....  
 a) 0.0462m<sup>3</sup>/s                      b) 0.0747 m<sup>3</sup>/s                      c) 0.0262 m<sup>3</sup>/s                      d) 0.0662 m<sup>3</sup>/s                      2                      L3                      CO2 PO1

11. In a 1/50 model of spillway, the discharge was measured to be  $0.3\text{m}^3/\text{s}$ , The corresponding prototype discharge in  $\text{m}^3/\text{s}$  is .....
- a)  $5303.3\text{m}^3/\text{s}$       b)  $1473.53\text{m}^3/\text{s}$       c)  $2303.0\text{m}^3/\text{s}$       d)  $7140.6\text{m}^3/\text{s}$
12. Dickens formula predicts maximum flood discharge  $Q$  in terms of the area  $A$  and the coefficient  $C$  as  $Q = c.A^n$ . The value of  $n$  is .....
- a) 0.2                      b) 0.55                      c) 0.35                      d) 0.75
13. If duty is 1428 ha/cumec and base period is 120 days for an irrigated crop, then delta is \_\_\_\_\_
- a) 102.8m                  b) 0.73 m                  c) 1.38 m                  d) 0.01 m
14. A 6 hr UH of a catchment is triangular in shape with a total time base of 36 hrs and a peak discharge of  $18\text{m}^3/\text{s}$ . The area of the catchment \_\_\_\_\_
- a)  $233.0\text{ Km}^2$               b)  $117.0\text{ Km}^2$               c)  $1.2\text{ Km}^2$               d)  $543.7\text{ Km}^2$
15. A ground water sample was found to contain  $500\text{mg/l}$  TDS. % TDS present in the sample is \_\_\_\_\_
- a) 0.02 %                  b) 0.07%                  c) 0.09 %                  d) 0.05%
16. Aeration of water is done to remove
- a) Suspended impurities                      b) colour
- c) Dissolved salts                              d) Dissolved gases
17. Calculate psychological widening if the design speed of a road is 90 kmph and had a radius of 300 m.
- a) 0.54 m                      b) 0.45 m                      c) 0.35 m                      d) 0.3 m
18. The IRC has fixed the maximum limit of super elevation in urban road stretches as
- a) 8%                          b) 7%                          c) 6%                          d) 5%
19. The percentage of time during which wind intensity is less than 6.4kmph is called as \_\_\_\_\_
- a) Enoscope                      b) Impact Factor
- c) Calm period                      d) Sight distance
20. Which of the following structures protects the shore by trapping of littoral drift?
- a) Groynes                      b) Sea wall                      c) Revetments                      d) Moles
21. The stopping sight distance of a vehicle moving with 45kmph and having a coefficient of friction as 0.4 is.....
- a) 48m                          b) 49m                          c) 50m                          d) 51m

22. The difference between the time available to do a job and the time required to do the job, is known as
- a) Event                      b) Float                      c) Duration                      d) Constraint
23. Critical path lies along with the activities having total float
- a) Positive                      b) Negative                      c) 0                      d) Same
24. Bar charts are suitable for
- a) Minor works
- b) Major works
- c) Large projects
- d) All the above
25. The direct and indirect cost estimated by a contractor for bidding a project is Rs. 1,60,000 and Rs. 20,000 respectively. If the mark up applied is 10% of the bid price, the quoted price of the contractor is\_\_\_\_\_
- a) 1,98,000
- b) Rs. 1,96,000
- c) Rs. 2,00,000
- d) Rs. 1,82,000

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