TABLE OF CONTENTS

Sl. No.	Syllabi of Various Civil Engineering Exams Published by KPSC	Page No.
1	Assistant Professor in Civil Engineering (2023)	9
2	Lecturer in Civil Engineering (Govt. Polytechnic) (2023)	12
3	Assistant Engineer (Direct & By Transfer) Kerala Water Authority (2022)	28
4	Assistant Engineer - Pollution control Board (2022)	34
5	University Engineer (Uniersities in Kerala)	39
6	Assistant Town Planner in Town and Country Planning (2023)	42
7	Junior Instructor (Arithmetic - Cum -Driwing) Industrial Training	46
8	Assistant Engineer, Ground Water Department (2022)	49
9	Junior Instructor (Draftsman Civil) Engineering Assistant Gr. II	52
10	Assistant Engineer, Soil Conservation	54
11	Draftsman Gr.I / Town Planning Surveyor Grade I (2023)	56
12	Draftsman Gr.III / Overseer Grade III - Harbour Engineering, LSGD, Irrigation (2023)	61
13	Tracer Agriculture	63
14	Tracer - Soil survey and Soil Conservation Department	68
15	Overseer Grade III/ Tracer - KWA	73
16	Draftsman Gr.I / II Ground Water Department (2023)	75
17	Assistant Engineer Head Draftsman/Assistant Director (Civil)/Instructor	83
18	Assistant Project Engineer (The Kerala Land Development Corporation Ltd.)(2023)	86
19	Draftsman Gr. I {Kerala Water Authority} Sub Engineer (Civil) (KSEB Ltd.) (2023)	90
20	Tracer/ Surveyor Gr. II (Survey and Land Records)	96
21	Junior Instructor - Surveyor (Industrial Training) SR for SC and ST only	98

QUESTION PAPERS

1	Draftsman Gr.III - Harbour Engineering (178/2005)	101
2	Junior Technical Officer- Kerala Financial Corporation (332/2005)	107
3	Assistant Engineer- Harbour Engineering (186/2005)	115
4	Draftsman Gr.III- PWD/Irrigation(250/2006)	122
5	Surveyor Grade II - Survey and Land Records(263 / 2006)	129
6	Overseer Grade III- PWD/ Irrigation (275/2006)	136
7	Work Superintendent- Agriculture (264 / 2006)	143
8	Junior Instructor- Industrial Training (292/2006)	149
9	Field Assistant - Port (128/2006)	155
10	Draftsman Grade-II -Kerala Water Authority (262/2006)	162
11	Assistant Engineer - Soil conservation (157/2006)	169
12	Overseer - Kerala State Cashew Development Corporaton (139/2006)	177
13	Vocational Instructor - VHSE (144/2007)	184
14	Tracer - Town and Country Planning (118/2007)	190
15	Work Superintendent - Agriculture (240/2007)	196
16	Draftsman Grade II. - Ground Water (237/2007)	202
17	Draftsman Grade I - PWD/Irrigation (248/2007)	208
18	Tracer - Ground Water (199/2007)	214

Syllabi of Various Civil Engineering Exams Published by KPSC

ASSISTANT PROFESSOR IN CIVIL ENGINEERING (2023)

Module I (25 marks)

Engineering Mechanics, Mechanics of Structures, Concrete and Construction Technology, Surveying, Quantity surveying and Valuation.

Mechanics-statics-coplanar forces-conditions of equilibrium, support reactions (simply supported and overhanging beams)- Friction-laws of friction-applications, Centre of gravity, moment of inertia of plane areas-Dynamics-rectilinear motion-Newton's laws of motion- curvilinear motion.

Simple stress and strain relationship in two dimensions- normal and shear stresses & strains-relationship between elastic constants, Bending Moment & Shear force for cantilever beams and Simply supported beams for different types of loading. Bending stresses and shear stresses in symmetrical cross sectionsprincipal stresses -Torsion of solid and hollow circular shafts. Direct and bending stresses in short columns-buckling/crippling load for columns with different end conditions.

Concrete –fresh and hardened properties-mix design- Aggregates – Mechanical & Physical properties- Grading requirements. Construction- planning and scheduling- bar charts,CPM,PERT.

Principles of surveying and levelling, contouring, theory of errors, reduction of levels in levelling. computation of areas and volume, theodolite, triangulation, Total station-working principles.

Quantity surveying & valuation – Building construction – detailed specification, preparation of data and analysis of rates for various items of work. Type of estimates – Detailed estimate for buildings. Valuation methods. GIS, Geoinformatics, Total Action

Module II: Geotechnical Engineering (15 marks)

Soil Mechanics—basic soil properties -relationship between basic soil properties. Index properties - sieve analysis – well graded, poorly graded and gap graded soils,Stoke's law, hydrometer analysis, relative density, consistency, Atterberg Limits, classification of soils. Permeability of soils -Principle of effective stress -Shear strength of soil, compressibility and consolidation - normally consolidated, under consolidated and over consolidated states - estimation of pre consolidation pressure estimation of magnitude of settlement of normally consolidated clays, coefficient of consolidation. Stability of finite slopes - Toe failure, base failure, slip failure - Factor of safety with respect to cohesion and angle of internal friction - stability number. Compaction of soils - Standard Proctor, Modified Proctor, I.S. light & Heavy Compaction Tests – OMC - Zero Air voids line - Control of compaction. Stresses in soil due to loaded areas - vertical stress beneath loaded areas of strip, rectangular and circular shapes, Isobarspressure bulbs-lateral earth pressure – at-rest, active and passive earth pressures - Influence of surcharge, inclined backfill and water table on earth pressure-Earth pressure on retaining walls with layered backfill.

Shallow foundations – ultimate, safe and allowable bearing capacity, failure mechanism, local and general shear failure - factors affecting bearing capacity – influence of water table -allowable bearing capacity of Rafts on sands and clays. Deep foundations - elements of a well foundation – problems encountered in well sinking – methods to rectify tilts and shifts. Pile foundations - point bearing and friction piles - bearing capacity of single pile in clay and sand[I.S. Static formulae] -group action - group efficiency - capacity of Pile groups.

ASSISTANT ENGINEER (DIRECT & BY TRANSFER)
KERALA WATER AUTHORITY (2022)

PART I - CIVIL ENGINEERING [25 Marks]

1. Mechanics of Solids and Structural Analysis (4 Marks)

Concept of stress and strain, relationship between elastic Constants, strain energy and complementaryenergy-strain energy due to tension. Bending moment and shear force, Stresses in beams, beams of uniform strength - beams of two materials – strain energy due to bending - shearing stresses in beams.

Stress on inclined planes for axial and biaxial stress fields - principal stresses - Mohr's circle of stress. Thin and Thick Cylinders, Torsion of solid and hollow circular shafts. Springs: Close coiled and open coiled helical springs. Deflection of beams, Theory of columns, Truss analysis, Displacement response of statically determinate structural systems using energy methods, Principle of virtual work, Statically indeterminate structures, Strain Energy methods, Moving loads and influence lines, Arches. Slope Deflection Method, Moment Distribution Method, Clapeyrons Theorem (Three Moment Equation).

2. Fluid Mechanics and Water Resources Engineering (4 Marks)

Fluid Statics- Fluid pressure, Buoyancy and floatation, Fluid Kinematics, Dynamics of fluid flow, Flow through orifice and notches, Flow through pipes, Boundary layer, Drag and Lift on immersed bodies. Hydraulic machines- flow through vanes (moving and stationary) Impulse and reaction Turbines, Centrifugal Pumps, Open channel flow, Uniform flow, Hydraulic Jump, Gradually varied flow, Dimensional analysis and model testing.

Hydrologic cycle, Precipitation, Infiltration and Evaporation-measurement and data analysis. Runoff-components and computation, Hydrograph, Unit Hydrograph and SHydrograph. Irrigation types and methods-Soil water plant relationships, Frequency of irrigation, Computation of crop water requirement. Stream flow measurement -Stage- discharge curve. Meandering of rivers, river training works. Surface water systems: diversion and storage systems, reservoir - estimation of storage capacity and yield of reservoirs - reservoir sedimentation -useful life of reservoir. Groundwater - Aquifer types and properties - Steady radial flow into a well. Estimation of yield of an open well.

3. Surveying and Levelling, Quantity Surveying and Valuation (4 Marks)

Basics of Surveying, Levelling and Contouring, Area and Volume Computation, Theodolite Survey, Mass Diagram. Principles, Linear, angular and graphical methods, Survey stations, Survey lines- ranging, Bearing of survey lines, Local attraction, Declination, Dip, Latitude and Departure, Methods of orientation, Principle of resection. Principles of levelling- Dumpy level, booking and reducing levels, Methods- simple, differential, reciprocal leveling, profile levelling and cross sectioning. Digital and Auto Level, Errors in leveling. Triangulation, Theory of Errors, Electronic Distance Measurement, Total Station Survey, Global Positioning Systems, Remote Sensing, Contouring: Characteristics, methods, uses. Geographical Information System.

Analysis of rates - Data book and schedule of rates, Analysis of rates for various items of work, Detailed specification. Types of Estimate. Detailed estimate including quantities, abstract and preparation of various items of works, Preparation of bar bending schedules for various RCC works. Valuation- Methods of valuation, Depreciation, Fixation of rent.

4. Building materials, Construction Technology, Construction Management (3 Marks)

Name of Post : **Draftsman Gr.III** Question Paper Code : **178/2005**
Department : **Harbour Engineering** Date of test : **07/05/2005**

1. The string of a kite is 150 m long and its makes 30° to the horizontal. Find height of the kite

A. 75 m B. 100 m
C.120 m D. 85 m

2. The value of sin 30° + tan 45° + cos 60°=

A. 2/√3 B. 1/√3
C. 2 D. 1

3. Sin^2 50° = 0.766 then value of sec^2 40° is

A. 1.532 B. 1/1.532
C. 1/0.766 D. 0.766

4. Sin^2 30° + cos^2 30° =

A. 1/4 B. 1/2
C. 1 D. 0

5. The value of 36° in radians =

A. π/2 radians B. 2π/5 radians
C. π/5 radians D. 3π/2 radians

6. Sin^2 45° + cos^2 60° is

A. 3/4 B. 1/4
C. 1 D. 1/2

7. $\sqrt{\frac{0.289}{0.00121}}$

A. 17/11 B. 1.7/0.011
C. 170/11 D. 0.17/0.11

8. Sin(14.5)°=0.25, then the value of cosec (14.5)° =

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

9. Sin 3A =

A. 3 sin A - 4 sin^3 A B. 3 sin A + 4 sin^3 A
C. 3 sin^2 A - 4 sinA D. 4 sin A - 3 sin^3

10. tan^2A =

A. 2 tan^2A/(1-tanA) B. 2 tan A / (1-tan^2A)
C. 2 tan^2 A/(1+tan A) D. 2 tan^2A/(1-tan^2A)

11. The scale of chords is used to measure the

A. Length B. Area
C. Angle D. Diameter

12. A line is inclined to both HP and VP, the length of elevation and plan is

A. Same as true length
B. Greater than the true length
C. Double the length of true length
D. Less than the original length

13. The symbol for indicating the angle of projection recommended by BIS

A. Two views of frustum of cone lying horizontally
B. Two views of frustum of cone lying vertically
C. Two concentric circle and rectangle
D. None of the above

14. Take the odd man out

A. Octagon B. Square
C. Hexagon D. Pentagon

15. A circular lamina perpendicular to both VP and HP its plan and elevation is

A. Plan is a line and elevation is an ellipse
B. Plan is an ellipse and elevation is a line
C. Both plan and elevation are lines perpendicular to xy line
D. None of the above

16. A line AB is inclined 30° to HP and 40° to VP. The apparent inclination of elevation and plan to XY line

A. Equal to 30° and 40°
B. Less than 30° and 40°
C. Elevation make 60° and plan make 80°
D. Elevation and plan make a greater angle to xy than 30° and 40° respectively

17. The traces of lamina is

A. A straight line B. A point
C. A curved line D. A plane figure

18. Lune "or" Gore method is used for drawing the development of a …..

A. Circular cone B. Sphere
C. Pipe D. Prism

19. The maximum slant length of square pyramid of base edgde 6 cm. & height 8 cm

A. √64 cm B. √82 cm
C. √100 cm D. √73 cm

20. The isometric view and orthographic view of an object is same

A. Cone B. Cylinder
C. Cube D. Sphere

21. A right circular cone is resting on HP by its base, a parallel cutting plane passing through half of the height to cone. The area of cut section will be equal to

A. 1/4th area of the base
B. 1/2th area of the base
C. 1/3 th area of the base
D. Equal to the area of the base

22. A line AB 60 mm long inclined 60° to HP and parallel to VP, the length of plan view is

A. 60 mm B. 30 mm
C. 42.5 mm D. 52.5 mm

23: "R.F." of a scale used in engineering drawings mean

A. Reduced fraction
B. Recommended fraction
C. Representative fraction
D. Remedial fraction

24. A point P is 3 cm above HP and 2 cm behind VP. Which of the following statements is true

A. Elevation of the point is above x-y line
B. Plan of the point is above x-y line
C. Point is in the second quandrant
D. All the above three statement are true

25. Take the odd man out

A. Circle B. Ellipse
C. Parabola D. Hyperbola

26. Which of the following statement is not related to ellipse?

A. The eccentricity is less than one
C. It has two directrix
B. It has only one axis
D. It has two focus

27. The included area of parabola is approximately equal to area of the circumscribing parallelogram.

A. 3/4 B. 2/3
C. 1/2 D. 1/4

28. The eccentricity "e" of a parabola is

A. e>1 B. e<1
C. e >1 D. e=1

29. Trimmed size of A2 drawing sheet

A. 420 × 594 B. 520 × 594
C. 594 × 841 D. 494 × 521

30. Sphere radius is represented by the symbol in drawing

A. OR B. SR
C. ⊗R D. RSP

31. How many methods are used for placing dimensional values in drawings as per "BIS"?

A. 5 B. 3
C. 2 D. Infinity

32. Which of the following is enlarged scale?

A. 50:50 B. 1:50
C. 2:50 D. 50:1

33. A regular polygon is a plane figure

A. Having more than four equal sides and equal angles
B. Having more than three equal sides and equal angles
C. Having four sides and equal angles
D. All of the above

34. Which of the following statement is not true "for dimensioning"

A. Projection lines extended slightly beyond the dimension line
B. Dimension lines and projection lines are thick lines
C. Two systems of dimensioning should not mixed up
D. All of the above three statement

35. Ogee curves are used to connect

A. Two curve B. Two circle
C. Two straight line D. Two triangles

36 Scalene triangle is a triangle

A. Having three equal sides
B. Having two equal sides and two equal angles
C. Having two equal angles and a right angle
D. Having three different sides and different angles

37. "BIS" abbreaviation stand for

A. Bureau of Indian Standards
B. Business Information System
C. Bureau of Investigation System
D. Bureau of Instruments Standards

38. "Grid reference" in drawing is used for

A. Beautify the drawing sheet
B. Manufactures symbols used
C. Drawing symbols used
D. Locating, a particular position in the drawing

39. Which symbol is used for indicating the "origin" in drawings?

A. ⊙ B. ⊕
C. ⊗ D. None of these

40. The ratio between two adjacent side of the drawing sheet

A. 1:√5 B. 1:√3
C. 1:√2 D. 1:1

41. In which regular polygon sides are equal to radius of circumscribing circle

A. Octagon B. Heptagon
C. Hexagon D. Pentagon

42. Path of a projectile is in the form of a …..

A. Ellipse B. Hyperbola
C. Semicircle D. Parabola

43. Which conic is known as "central conic"

A. Hyperbola B. Parabola
C. Circle D. None of these

44. A conic which have only one directrix

A. Ellipse B. Circle
C. Hyperbola D. Parabola

45, "Asymptote" is

A. Central axis of conics
B. Area of the conic
C. Tangents drawn infinity to a circle
D. Tangents drawn from infinity to a hyperbola

46. Which conic shape is widely used in engineering application?

A. Parabolic B. Circle
C. Hyperbolic D. Elliptical

47. Auxiliary views are

A. Perpendicular views of inclined surface only
B. Parallel views of inclined surface
C. Enlarged views of parts
D. Reduced views of parts

48. Cycloidal curves are included in which groups

A. Helix B. Spiral
C. Conics D. Roulette

49. The ratio of Isometric view to Isometric projection

A. 1:0.816 B. 1:8.16
C. 1:0.876 D. 1:0.916

50. Take the odd man out

A. Cavalier projection
B. Cabinet projection
C. General oblique projection
D. Orthographic projection

51. The maximum number of tangents drawn to a circle from a point outside the circle

A. 2 B. 4
C. 16 D. Infinity

52. The chord passing through the focus of a conic and perpendicular to the axis is called

A. Focal tangent B. Focal chord
C. Focal radius D. Focal normal

53. Bow compass is used for

A. Drawing big circle
B. Drawing very small circle
C. Drawing curves
D. Drawing parallel lines

54 "Clinograph" is a

A. Instruments used for measuring angle
B. Instrument used for measuring distance
C. Adjustable set square
D. None of these

55. Which of the following is not in the group?

A. Box method
B. Triangulation method
C. Radial line method
D. Parallel line method

56. A circular lamina inclined 45° to both HP and VP. Which of the following statements is true.

A. Elevation is a circle and plan is an ellipse
B. Elevation is an ellipse and plan is a circle.
C. Both elevation and plan are ellipse.
D. Both elevation and plan are circle.

57. At the magnetic poles, amount of dip is

A. 0° B. 45°

C. 60° D. 90°

58. The number of edges in a Octahedron

A. 8 B. 16

C. 12 D. 24

59. A solid generated by the revolution of a semicircle about its diameter is called

A. Cylinder B. Hemisphere

C. Sphere D. Cone

60. The instrument that is used for measurement of angles

A. Geodimeter B. Tellurometer

C. Sextan D. Telescope

61. If 2m +n = m+2n, then m- n is equal to

A. 0 B. 2

C. 3 D. 4

62. 25% of 200 + 20% of 150 is

A. 50 B. 60

C. 70 D. 80

63. Successive discount of 10% and 20% is equivalent to a single discount of

A. 30% B. 28%

C. 26% D. 32%

64. The sum of 0.2 + 0.02 + 0.002 + 0.00002

A. 0.2222 B. 0.2202

C. 0.22202 D. 0.22222

65. The square root of 0.64

A. 0.6 B. 8

C. 0.8 D. 0.08

66. $\sqrt[3]{(-8)} \times \sqrt[4]{(16)}$ is equal to :

A. 4 B. 2

C. 2 D. -4

67. Which of the following is largest ?

A. 39/48 B. 28/32

C. 31/40 D. 63/80

68. If 2x + y = 5 then 4x + 2y is =

A. 10 B. 9

C. 8 D. 5

69. $(\sqrt{0.16}) / 0.4 = \ldots\ldots$

A. 0.1 B. 1

C. 10 D. None of these

70. $(2^5 \times 9^2) / (8^2 \times 3^5) = \ldots\ldots\ldots\ldots$

A. 2/3 B. 1/6

C. 3/2 D. 1/8

71. If x+y=6 and 3x-y=4, then x-y = …..

A. 4 B. 2

C. 0 D. -1

72. If $x/y = 2/3$ then y^2/x^2 is equal to :

A. 4/9 B. 2/3

C. 3/2 D. 9/4

73. 95^2 =

A. 9025 B. 9125

C. 9175 D. 8925

74. Which of the following number is a perfect square:

A. 10464 B. 10404

C. 10420 D. None of these

75. The area of the floor of a room is 20 m² and that of the larger wall is 15 m² and that of shorter wall is 12 m². Find the volume:

A. 45 m^3 B. 75 m^3

C. 60 m^3 D. 40 m^3

76. How many bricks of 20 cm by 10 cm size will be required to pave the floor of a room 8m long 5m wide :

A. 25,000 B. 2,500

C. 2,000 D. 20,000

77. What is the length of sheet 2m wide, required for making an open tank 10m long, 4m wide & 6m height:

A. 84 m B. 94 m

C. 104 m D. 124m

78: The surface area of a cube is 150 m² find its volume:

A. 125 m^3 B. 120 m^3

C. 130 m^3 D. 135 m^3

79. A piece of wire 78 cm long is given a shape of an isosceles triangle. The ratio of one equal side to the base is 5:3. The length of base in cm.

A. 14 cm B. 16 cm

C. 18 cm D. 20 cm

80. How many cubes of 3 m. edge can be cut of a cube of 18 m. edge?

A. 632 B. 432

C. 316 D. 216

81. Area of a rectangular field is 1,200 m² and its length is 3 times width. What is the perimeter?

A. 160 m B. 200 m

C. 240 m D. 280 m

82. The base of a triangle is 25 cm and altitude is 12 cm. Area will be

A. 15 cm^2 B. 150 cm^2

C. 30 cm^2 D. 300 cm^2

83. On the floor of a room, there is carpet measuring 10m x 13m. There is a surround 2.5 m wide. The area of the surround:

A. 120 m^2 B. 130 m^2

C. 140 m^2 D. 150 m^2

84. A rectangular field is 36m long & 30m wide. A path of uniform width and of area 360 m^2 run around inside it. Find the width

A. 6m B. 4.5m

C. 4m D. 3m

85. The volume of sphere of diameter 2 m = …..

A. $4\pi/3$ m^3 B. $3/4\pi$ m^3

C. $6/8\pi$ m^3 D. 5π m^3

86. How far will a wheel of 1m diameter travel in 200 revolutions?

A. 314 m B. 628 m

C. 62.8 m D. 1256 m

87. An isosceles triangle has two equal side of length 'a' and angle between them is α. Then the area of triangle:

A. $a^2 \cos\alpha$ B. $(a^2/2) \cos\alpha$

C. $(a^2/2) \sin\alpha$ D. $a^2 \sin\alpha$

88. Which of the following pair of lines can not be parallel?

A. Two tangents of circle

B. Two chords of circle

C. Two diameters of circle

D. None of the above

89. The curved surface area of a cylinder is double (two times) the base area. The ratio of height to radius:

A. 1:2 B. 2:1

C. 1:1.5 D. 1:1

90. The radius of a circular sector is doubled. The area will be increased how many times :

A. 2 B. 3

C. 4 D. 8

91. Total surface area of hemisphere of radius 1 m. is equal to :

A. 3π m^2 B. 4π m^2

C. 8π m^2 D. 5π m^2

92. Area of hexagonal lamina having side 4 cm:

A. $24\sqrt{3}$ cm^2 B. $16\sqrt{3}$ cm^2

C. $8\sqrt{3}$ cm^2 D. $4\sqrt{3}$ cm^2

93. The perimeter of a circle, pentagon, octagon and hexagon are same. Which is having more area?

A. Hexagon B. Circle

C. Pentagon D. Octagon

94. The area of a triangle = $\sqrt{s(s-a)(s-b)(s-c)}$. Here "s" stands for :

A. Perimeter of the triangle

B. Half the perimeter of the triangle

C. Double the perimeter of the triangle

D. None of the above.

95. A circular ring is having outside diameter 8 cm and inside diameter 6 cm. What should be the area?

A. 25.12 cm^2 B. 12.56 cm^2

C. 6.28 cm^2 D. 22 cm^2

96. The following polygon are inscribed in a circle having same diameter which polygon should have maximum area:

A. Pentagon B. Hexagon

C. Heptagon D. Octagon

97. The radius of a sphere is doubled, the volume increased how many times?

A. 8 B. 6

C. 4 D. 2

98. Find the ratio of volumes of a circular cone to a cylinder having same diameter and height:

A. 1:2 B. 1:3

C. 1:4 D. 1:5

99. An alloy of tin and copper consists 20 parts tin and 100 parts copper the % tin in the alloys.

A. 20 B. 15.5

C. 16.66 D. 22.22

100. A regular hexgonal prism of metal, having base edge 4 cm. and height 4 cm is melted and produced small hexagonal prism of height 4 cm. and base edge 1 cm. How many small prism will get :

A. 4 B. 8

C. 12 D. 16

ANSWER KEY

1	**A**	21	**A**	41	**C**	61	**A**	81	**A**
2	**C**	22	**B**	42	**D**	62	**D**	82	**B**
3	**C**	23	**C**	43	**A**	63	**B**	83	**C**
4	**C**	24	**D**	44	**D**	64	**C**	84	**D**
5	**C**	25	**A**	45	**D**	65	**C**	85	**A**
6	**A**	26	**B**	46	**A**	66	**D**	86	**B**
7	**C**	27	**B**	47	**A**	67	**B**	87	**C**
8	**B**	28	**D**	48	**D**	68	**A**	88	**C**
9	**A**	29	**A**	49	**A**	69	**B**	89	**D**
10	**C**	30	**B**	50	**D**	70	**B**	90	**C**
11	**C**	31	**C**	51	**A**	71	**D**	91	**A**
12	**D**	32	**D**	52	**B**	72	**D**	92	**A**
13	**A**	33	**A**	53	**B**	73	**A**	93	**B**
14	**B**	34	**B**	54	**C**	74	**B**	94	**B**
15	**C**	35	**C**	55	**A**	75	**C**	95	**D**
16	**D**	36	**D**	56	**C**	76	**C**	96	**D**
17	**A**	37	**A**	57	**D**	77	**C**	97	**A**
18	**B**	38	**D**	58	**C**	78	**A**	98	**B**
19	**C**	39	**B**	59	**C**	79	**C**	99	**C**
20	**D**	40	**C**	60	**C**	80	**D**	100	**D**

Name of Post : **Engineering Assistant Grade - I**
Department : **KSCC**
Question Paper Code : **085/2022**
Date of test : **30/08/2022**

1. The strain energy due to bending stress is :

A. $\int \frac{M^2dx}{EI}$ B. $\int \frac{M^2dx}{4EI}$

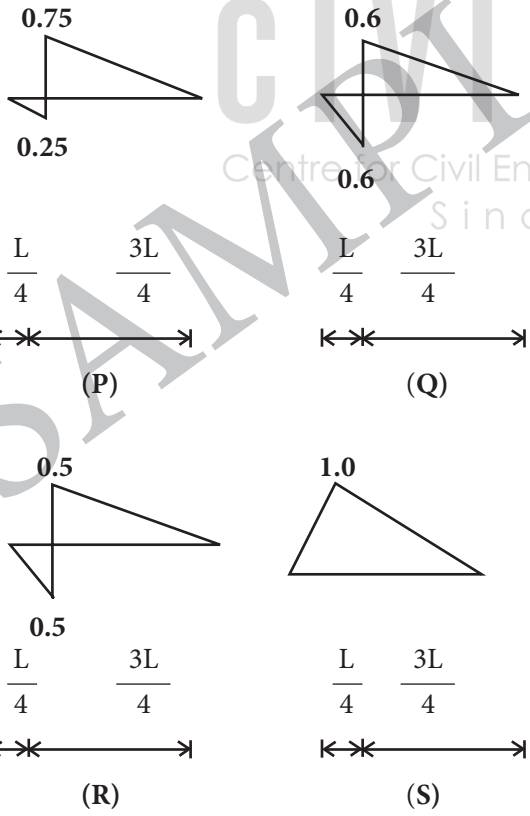
C. $\int \frac{M^2dx}{2EI}$ D. $\int \frac{Mdx}{2EI}$

2. A cantilever is subjected to a uniformly distributed load w kN/m. It is propped by a spring of stiffness k to the same level as that of the fixed end, before loading. The reaction at the prop will be :

A. $\frac{3}{8}$ wl + k B. $\frac{3}{8}$ wl – k

C. $wl\left[\frac{(3/8)}{1-\frac{3EI}{kl^3}}\right]$ D. $wl\left[\frac{(3/8)}{1+\frac{3EI}{kl^3}}\right]$

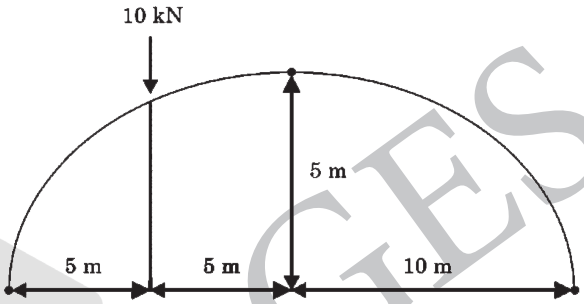
3. In a beam of length L , four possible influence line diagrams for shear force at a section located at a distance of L / 4 from the left and support (market as P, Q, R and S) are shown below. The correct influence line diagram is :



A. P B. Q

C. R D. S

4. A three hinged parabolic arch having a span of 20 m and a rise of 5 m carries a point load of 10 kN at quarter span from the left end as shown in the figure. The resultant reaction at the left support is :



A. 9.01 kN B. 5 kN

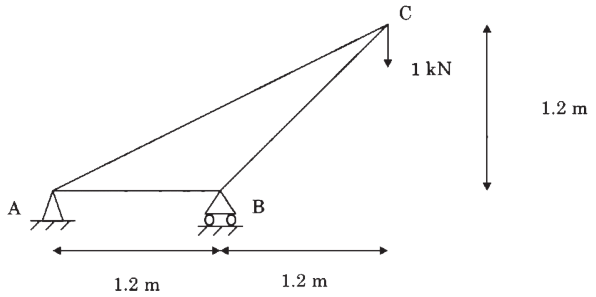
C. 7.50 kN D. 2.50 kN

5. A simply supported beam is subjected to a uniformly distributed load of intensity w per unit length, on half of the span from one end. The length of the span and the flexural stiffness are denoted as l and EI, respectively. The deflection at mid-span of the beam is :

A. $\frac{5}{6144}\frac{\omega l^4}{EI}$ B. $\frac{5}{768}\frac{\omega l^4}{EI}$

C. $\frac{5}{384}\frac{\omega l^4}{EI}$ D. $\frac{5}{192}\frac{\omega l^4}{EI}$

6. Find the force in the member AB :



A. 2 kN Compression B. 2 kN Tension

C. 1 kN Compression D. Zero kN

7. The ratio of the theoretical critical buckling load for a column with fixed ends to that of another column with the same dimensions