

Uka Tarsadia University	
Diploma Engineering MCQ Question bank	
Subject Code: 020030602	Date:
Subject Name: Design of RCC Structures	

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Each question is of 1 mark.
4. Use of SIMPLE CALCULATOR is permissible. (Scientific/Higher Version not allowed)
5. English version is authentic.

Unit 3- Design of Slabs			
1	The effective span of a simply supported slab, is		
	Distance between the centres of the bearings		Clear distance between the inner faces of the walls plus twice the thickness of the wall
	Clear span plus effective depth of the slab		None of the above
2	Design of a two way slab simply supported on edges and having no provision to prevent the corners from lifting, is made by		
	Rankine formula		Marcus formula
	Rankine Grashoff formula		Grashoff formula
3	The transverse reinforcements provided at right angles to the main reinforcement		
	Distribute the load		Resist the temperature stresses
	Resist the shrinkage stress		All of the above
4	The amount of reinforcement for main bars in a slab, is based upon		
	Minimum bending moment		Maximum bending moment
	Maximum shear force		Minimum shear force.
5	The percentage of minimum reinforcement of the gross sectional area in slabs, is		
	0.10 %		0.12 %
	0.15 %		0.18 %
6	In a simply supported slab the minimum spacing of distribution reinforcement, should be four times the effective thickness of the slab or		
	300 mm		400 mm
	500 mm		600 mm
7	If the sides of a slab simply supported on edges and spanning in two directions are equal,		

	the maximum bending moment is multiplied by		
	0.2		0.4
	0.5		0.7
8	Distribution reinforcement in a simply supported slab, is provided to distribute		
	Load		Temperature stress
	Shrinkage		All of the above
9	The maximum ratio of span to depth of a cantilever slab, is		
	8		10
	12		14
10	An R.C.C. roof slab is designed as a two way slab if		
	It supports live loads in both directions		The ratio of spans in two directions is less than 2
	The slab is continuous over two supports		The slab is discontinuous at edges.
11	In a slab, the pitch of the main reinforcement should not exceed its effective depth		
	3 times		4 times
	2 times		5 times
12	The maximum ratio of span to depth of a slab simply supported and spanning in one direction, is		
	25		30
	35		50
13	In a simply supported slab, alternate bars are curtailed at		
	1/4th of Span		1/5th of Span
	1/7th of Span		1/10th of Span
14	In a one way slab load is distributed over		
	Shorter side		Longer side
	Both side		None of the above
15	In a two way slab load is distributed over		
	Shorter side		Longer side
	Both side		None of the above
16	Slab always carried by default		
	UDL		Point load
	Both		None of the above
17	What is the correct equation for one way slab?		
	$l_y/l_x = 2$		$l_y/l_x < 2$
	$l_y/l_x > 2$		None of the above
18	Which slab is resting directly on the columns?		
	Cantilever slab		Flat slab

		Simply supported slab		Continuous slab
19	Which slab permits spanning on both side with reinforcement?			
		One way slab		Flat slab
		Continuous slab		Two way slab
20	Which type of slabs allow excess floor height?			
		Cantilever slab		Flat slab
		Simply supported slab		Continuous slab
21	Which type of slabs are only supported on periphery?			
		Cantilever slab		Flat slab
		Grid Slabs		Continuous slab
22	Store limit state theory: which type of analysis is done for slabs?			
		Elastic analysis		Non Elastic analysis
		Flexural Analysis		None of the above
23	Which type of slabs are preferred for construction of a hall or theatre?			
		Cantilever slab		Flat slab
		Grid Slabs		Continuous slab
24	As per IS 456 what is the ratio of span to depth for simply supported slab?			
		30		20
		7		None of the above
25	For steel grade fe415 what is the modification factor?			
		1.25		1
		1.15		1.50
26	For HYSD bars what is the minimum percentage of reinforcement in one way slab?			
		0.12 %		0.15 %
		0.2 %		0.8 %
27	What is the criteria for maximum diameter of bar in slab?			
		1/4 D		1/ 8 D
		1/ 5 D		1/ 10 D
28	What is the criteria for main bars as minimum diameter in slab?			
		8 mm		12 mm
		10 mm		16 mm
29	What is the criteria for distribution bars as minimum diameter in slab?			
		8 mm		6 mm
		10 mm		12 mm
30	As per IS 456 2000 what is the maximum value for main Steel spacing in slab?			
		300 mm		450 mm

		400 mm		250 mm
31	As per IS 456 2000 what is the maximum value for distribution Steel spacing in slab?			
		300 mm		450 mm
		400 mm		250 mm
32	How much reinforcement should be provided on top as bent up in slab?			
		30 %		45 %
		35 %		50 %
33	What is the alternative of bent up if more than 50% Steel is required as minimum steel in slab?			
		Only Bent up		Chapiya
		Development length		None of the above
34	In which type of slab torsion at corners is not produced?			
		Simply Supported two way slab		Restrained Slab
		One way slab		All of the above
35	In which type of slab the edge strips are provided??			
		Simply Supported two way slab		Restrained Slab
		One way slab		All of the above
36	The length of bar in torsion reinforcement in each layer in restrained slab is			
		$l_x/2$		$l_x/6$
		$l_x/4$		$l_x/5$
37	For $d=150$ mm, calculate effective span if clear span is 3200 mm. Provided support of 300mm			
		3350 mm		3500 mm
		3200 mm		None of the above
38	What is the maximum bending moment generated in one way slab??			
		$M = w.l/4$		$M = w.l^2/8$
		$M = w.l/2$		None of the above
39	Find area of steel A_{st} in one way slab if $P_t = 0.215$			
		215 mm^2		430 mm^2
		100 mm^2		322 mm^2
40	What is the equation for spacing of main bars in slab?			
		A/A_{st}		A_{st}/A
		$P_t \cdot bD$		None of the above
41	What is the minimum amount of cover provided in slabs?			
		15 mm		20 mm
		30 mm		40 mm

42	For M20 and Fe 250, what is the value of development length for a 10 mm bar in slab?		
	442 mm		500 mm
	453 mm		484 mm
43	What is the value of shear stress developed in a one way slab is shear force is 13500 Newton and 100 mm thickness?		
	$\tau = 0.135$		$\tau = 135$
	$\tau = 13.5$		$\tau = 1.35$
44	For $d=175$ mm, calculate effective span if clear span is 2200 mm. Provided support of 300 mm		
	2200 mm		2375 mm
	2500 mm		None of the above
45	For Fe 250 and $f_s = 415$ what is the magnification factor?		
	2.5		1.5
	2.0		None of the above
46	What is the depth of the slab is $F_y = 250$, M20 and moment $M = 10125 \times 10^6$?		
	$d = 60$		$d = 100$
	$d = 150$		$d = 80$
47	For which purpose bent ups are provided?		
	To resist moment		To resist shear
	To resist torsion		None of the above
48	Where does chipiya provide in slab?		
	When shear is too high		When bending moment is too high
	When A_{st} required is too low		All of the above
49	How it is identified that slab is one way or two way?		
	l_y/l_x		$l_y \times l_x$
	$l_y = 2. l_x$		None of the above
50	What is the value of shear stress developed in a one way slab is shear force is 12500 Newton and 100 mm thickness?		
	$\tau = 1.25$		$\tau = 125$
	$\tau = 12.5$		$\tau = 0.125$
Unit 4- Design of Shear Reinforcement and Development length			
1	An R.C.C. beam not provided with shear reinforcement may develop cracks in its bottom		

	inclined roughly to the horizontal at		
	30 degree		45 degree
	60 degree		15 degree
2	The maximum shear stress (q_{max}) in a rectangular beam is		
	1.25 times the average		1.75 times the average
	1.50 times the average		2.0 times the average
3	The radius of a bar bend to form a hook, should not be less than		
	twice the diameter		thrice the diameter
	four times the diameter		None of the above
4	The shear reinforcement in R.C.C. is provided to resist		
	Vertical shear		Horizontal shear
	Diagonal Tension		Diagonal compression
5	Spacing of stirrups in a rectangular beam, is		
	kept constant throughout the length		decreased towards the centre of the beam
	increased at the ends		increased at the centre of the beam.
6	the grip between concrete and cement in RCC structure is known as		
	Bond		Stress
	Strength		None of the above
7	The embedded length of reinforcement in concrete is known as		
	Bond length		Development length
	Shear length		All of the above
8	The equation for stresses in bar is		
	$\sigma_s = 0.46 f_y$		$\sigma_s = 0.56 f_y$
	$\sigma_s = 0.87 f_y$		$\sigma_s = 0.36 f_y$
9	The shear force acting in the direction of the length of bar and unit area of the bar is called		
	Shear Strength		Bond stress
	Development strength		All of the above
10	For the deformed bars in concrete how much bond stress value should be increased		
	40%		50%
	60%		75 %
11	If there are two reinforcement in the bundle bar, how much increment in a development length can be done?		
	10 %		20 %
	33 %		None of the above

12	What can be used if the requirement of development length is satisfied in tension?		
	Torsion reinforcement		Deformed bars
	Plain bars		None of the above
13	For value of reinforcement Fe415 find stresses in bar		
	361.1 N/mm ²		342.21 N/mm ²
	415 N/mm ²		250 N/mm ²
14	What is the minimum Anchorage value for 45 degree bends?		
	2 time dia of bar		4 time dia of bar
	8 time dia of bar		All of the Above
15	In the tension zone from which point the length of incline bar in shear is measured?		
	From Any point in beam		From centre height of beam
	From end of inclined bar		From bottom of the beam
16	In stirrups what should be the Anchorage length from the 90 degree bend?		
	6 times dia		8 times dia
	10 times dia		None of the above
17	What is the development length in competition for 20 mm diameter and M20		
	750 mm		775 mm
	725 mm		800 mm
18	What should be the ideal Anchorage value for 45 degree hooks?		
	12 time dia of bar		4 time dia of bar
	16 time dia of bar		All of the Above
19	What is the value of shear stress at any section of beam?		
	$\tau = V \cdot A \cdot b / I \cdot y$		$\tau = V \cdot A \cdot y / I \cdot b$
	$\tau = V \cdot I \cdot A / y \cdot b$		$\tau = V \cdot b \cdot y / I \cdot A$
20	what is the value of shear force at supports in simply supported beam?		
	$w \cdot l / 2$		$w \cdot l / 4$
	$w \cdot l \cdot l / 4$		$w \cdot l \cdot l / 8$
21	For value of reinforcement Fe 250 find stresses in bar		
	361.1 N/mm ²		217.5 N/mm ²
	415 N/mm ²		250 N/mm ²
22	For the compression bars in concrete how much bond stress value should be increased		
	25%		50%
	60%		75 %

23	Find the value of design bond stress for M20 and Fe415 steel.		
	1.2		1.52
	1.92		2.2
24	If there are three reinforcement in the bundle bar, how much increment in a development length can be done?		
	10 %		20 %
	33 %		None of the above
25	What can be used if the requirement of development length is satisfied in tension and plain bars to be used?		
	Torsion reinforcement		Deformed bars
	Hooks		None of the above
26	The shear stress acting at 45 degree on principal plane at simply supported beam is called		
	Diagonal Compression		Diagonal Tension
	Major shear		None of the above
27	In stirrups what should be the Anchorage length from the 235 degree bend?		
	6 times dia		8 times dia
	10 times dia		None of the above
28	The cracks developed at 45 degree due to two diagonal tension is called		
	Shear Cracks		Diagonal cracks
	compression cracks		None of the above
29	For value of reinforcement Fe 500 find stresses in bar		
	361 N/mm ²		217 N/mm ²
	435 N/mm ²		250 N/mm ²
30	The shear stress acting at 135 degree on minor principal plane at simply supported beam is called		
	Diagonal Compression		Diagonal Tension
	Major shear		None of the above
31	the value of maximum bending moment acting at the centre of simply supported beam is		
	w.l / 2		w.l/ 4
	w.l.l/ 4		w.l.l/8
32	Find the value of design bond stress for M25 and Fe415 steel.		
	1.4		2.24
	1.92		2.92
33	In order to remain safe in shear what should be the condition for shear strength of concrete?		
	$\tau_v < \tau_c$		$\tau_v > \tau_c$

		$\tau_v = \tau_c$		None of the above
34	In stirrups what should be the Anchorage length from the 180 degree bend?			
		6 times dia		8 times dia
		4 times dia		None of the above
35	Incline steps are always led at _____ degree angle.			
		30 degree		45 degree
		60 degree		90 degree
36	Find the value of design bond stress for M30 and Fe415 steel.			
		1.5		2.24
		1.92		2.40
37	If there are four reinforcement in the bundle bar, how much increment in a development length can be done?			
		10 %		20 %
		33 %		None of the above
38	What is the value of nominal share stress if the cross section of beam is 250 mm x 500 mm & shear force is 165000 N?			
		1.31 N/mm ²		1.32 N/mm ²
		1.33 N/mm ²		1.35 N/mm ²
39	What is the spacing of stirrups for beam with Ast= 100 mm ² , 250 mm width and Fe415 steel?			
		220 mm		300 mm
		100 mm		None of the above
40	Find the value of τ_c for 900 mm ² Ast and M20 concrete.			
		1		0.56
		0.86		0.44
41	Shear Cracks are always _____ in shape			
		Horizontal		Vertical
		Diagonal		Any of above three
42	What is the value of nominal share stress if the cross section of beam is 300 mm x 420 mm & shear force is 210000 N?			
		1.67 N/mm ²		1.62 N/mm ²
		1.65 N/mm ²		1.69 N/mm ²
43	Find the value of design bond stress for M25 and Fe415 steel in compression in doubly beam			
		1.4		2.24
		2.8		3.0

44	What is the maximum Anchorage value for 45 degree bends?		
	16 time dia of bar		4 time dia of bar
	8 time dia of bar		All of the Above
45	Find the value of τ_c for 1017 mm ² Ast and M20 concrete.		
	1		0.57
	0.86		0.44
46	What is the alternative of Bent up bars to trap shear cracks?		
	Chipiya		Torsional bars
	Development length		All of the Above
47	What is the value of nominal share stress if the cross section of beam is 230 mm x 415 mm & shear force is 150000 N?		
	1.57 N/mm ²		1.55 N/mm ²
	1.53 N/mm ²		1.58 N/mm ²
48	In the compression zone, from which point the length of incline bar in shear is measured?		
	From Any point in beam		From centre height of beam
	From end of inclined bar		From bottom of the beam
49	Choose the correct equation.		
	Net V_{us} = V_{us} - V_{usl}		V_{us} = V_{usl} = Net V_{us}
	V_{us} = Net V_{us} + V_{usl}		Net V_{us} = V_{us} + V_{usl}
50	What is the criteria for maximum spacing of stirrups?		
	Minimum of 0.5 d or 300 mm		Minimum of 0.5 d or 450 mm
	Minimum of 0.75 d or 450 mm		Minimum of 0.75 d or 300 mm
Unit 5- Design of Columns			
1	An R.C.C. column is treated as long if its slenderness ratio is greater than		
	30		35
	40		50
2	The diameter of longitudinal bars of a column should never be less than		
	12 mm		10 mm
	16 mm		20 mm
3	If the effective length of a 32 cm diameter R.C.C. column is 4.40 m, its slenderness ratio, is		
	40		45
	55		50
4	If the diameter of longitudinal bars of a square column is 16 mm, the diameter of lateral ties should not be less than		
	4 mm		5 mm
	6 mm		8 mm

5	The minimum clear cover for R.C.C. columns shall be			
		greater of 40 mm or diameter		greater of 25 mm or diameter
		smaller of 40 mm or diameter		smaller of 25 mm or diameter
6	Pick up the correct statement from the following:			
		Lateral reinforcement in R.C.C. columns is provided to prevent the longitudinal reinforcement from buckling		Lateral reinforcement in R.C.C. columns, is kept not less than 5 mm diameter
		Lateral reinforcement stops breaking away of concrete cover, due to buckling		All of the above
7	An R.C.C. column is treated as short column if its slenderness ratio is less than			
		50		40
		25		30
8	A column is regarded as long column if the ratio of its effective length and lateral dimension, exceeds			
		10		15
		20		25
9	As per IS : 456, the reinforcement in a column should not be less than			
		0.5% and not more than 5% of cross-sectional area		0.6% and not more than 6% of cross-sectional area
		0.7% and not more than 7% of cross-sectional area		0.8% and not more than 6% of cross-sectional area
10	For compression member if the effective length is three times more than and its lateral dimension then it is known as			
		Column		Beams
		Pedestal		All of the above
11	Following are the reasons for acting moment on column			
		Gravity Load		Earthquake
		Wind load		All of the Above
12	The type of column in which side sway or joint translation is not possible is			
		Braced Column		Unbraced column
		Pedestal		All of the above
13	Which of the following is a type of column according to lateral restraint?			
		Tied column		Composite column
		Spiral column		All of the above
14	Spiral or helical reinforcement are usually used in			
		Circular Column		Rectangle column
		Tee Shaped column		All of the above
15	For compression member if the effective length is three times less than and its lateral dimension then it is known as			
		Column		Beams

		Pedestal		All of the above
16	In actual field, column possesses an axial compression along with			
		Bending Moment		Shear force
		Torsion		All above
17	The column in which is bracing system is not provided to resist sites sway from horizontal forces is known as			
		Braced Column		Unbraced column
		Pedestal		All of the above
18	the purpose of lateral reinforcement in column is			
		To increase capacity of main reinforcement		To resist shear force
		To resist bending moment		All of the above
19	The action in column which allows lateral movement of two ends of column is known as			
		Side sway		joint Translation
		Both A and B		None of the above
20	The strength of the column depends upon			
		Material		Shape and size
		Length		All of the above
21	Usually pedestal is designed without _____ in concrete			
		Cement		Aggregate
		Reinforcement		None of the above
22	Brecings are usually provided in column for			
		Longitudinal Stability		Lateral stability
		Torsional Stability		None of the above
23	The failure of column due to axial compression is called			
		Buckling		Bulging
		Shear failure		Flexure
24	When when lateral ties are used in column the column is known as			
		Tied column		Composite column
		Spiral column		All of the above
25	What is the condition for a slender column?			
		$le/D = 12$		$le/D > 12$
		$le/D < 12$		None of the above
26	Column can be the shape of _____			
		Square, rectangle		Circular
		Ell shape, Tee shape		All of the above

27	What is the equation of moment in p delta effect in column?		
	$M = P \times \Delta$		$M = P / \Delta$
	$M_1 = P + \Delta$		None of the above
28	the minimum diameter of bar required for a main reinforcement in column is		
	10 mm		12 mm
	16 mm		20 mm
29	Whenever helical reinforcement is used as a tie in column it is known as		
	Tied column		Composite column
	Spiral column		All of the above
30	The failure of column due to eccentricity of load and moment is called		
	Buckling		Bulging
	Shear failure		Flexure
31	The minimum reinforcement required in a column is		
	0.6%		0.8 %
	2 %		6 %
32	How many bars are required as a minimum reinforcement in a column?		
	4		2
	6		8
33	Equation for minimum eccentricity in short column is		
	$e_{min} = (1 / 500 + D / 50)$		$e_{min} = (1 / 500 + D / 100)$
	$e_{min} = (1 / 500 + D / 60)$		$e_{min} = (1 / 500 + D / 30)$
34	What could be the ideal choice of the reinforcement in column provided 1200 mm Ast?		
	4-16 mm, 4-12 mm		6-16 mm
	4-20 mm		12-12 mm
35	Whenever the Steel sections are used instead of reinforcement, the column is known as		
	Tied column		Composite column
	Spiral column		All of the above
36	The maximum reinforcement required in a column is		
	0.6%		0.8 %
	2 %		6 %
37	What is the minimum eccentricity for the column is overall depth of column is 500 mm		
	25		20
	30		15
38	What is the minimum slenderness ratio for a long column?		
	55		50
	45		100

39	As per IS 456 every short column is always design for		
	Bending		Minimum Eccentricity
	Shear		All of the above
40	The maximum compressive strain in concrete in axial compression is taken as		
	0.002		0.004
	0.0002		0.0004
41	How many bars are required as a minimum reinforcement in a circular column?		
	4		2
	6		8
42	What is the maximum pitch allowed for helical reinforcement in a circular column?		
	300 mm		50 mm
	100 mm		75 mm
43	The vertical distance between two consecutive column ties is known as		
	Pitch		Gauge
	Edge Distance		None of the above
44	which property of the column with helical reinforcement is greater than the column with lateral ties?		
	Durability		Flexibility
	Ductility		All of the above
45	For column safety in eccentricity, what is the condition of e_{min} ?		
	$e_{min} = 20$		$e_{min} > 20$
	$e_{min} < 20$		None of the above
46	Which Indian standard and its class used to design actually loaded column		
	IS 1893: 2002		IS 800: 2007
	IS 456 :2000		All of the above
47	Which length of column is known as clear length ?		
	Unsupported length of column		Floor to floor length of column
	Centre to centre distance of column		None of the above
48	What is the maximum spacing allowed for consecutive bars in a column?		
	300 mm		200 mm
	450 mm		100 mm
49	What is the relation between the ultimate axle load capacity of circular column with rectangular column is		
	$P_u [R] = 1.5 \times P_u [C]$		$P_u [R] = 1.5 / P_u [C]$
	$P_u [C] = 1.5 / P_u [R]$		$P_u [C] = 1.5 \times P_u [R]$

50	The maximum strain in concrete at the outermost compression fibre is taken as			
		0.0030		0.0035
		0.0020		0.0010

****Best of Luck****