Q : Consider the following statements concerning both the working stress design and ultimate strength design of reinforced concrete:

1. Plane section before bending remains plane after bending.
2. The tensile strength of concrete is ignored

Of these statements

A : 1 alone is correct

B : 2 alone is correct

C : Both 1 and 2 are correct

D : Both 1 and 2 are false

Q : If f_{cu} and f_y are cube compressive strength of concrete and yield stress of steel respectively and E_s is the modulus of elasticity of steel for all grades of concrete, the ultimate flexural strain in concrete, can be taken as

A : 0.002

B : F_{cu} /1000

C : 0.0035

D : $F_y/1.15E_s$+0.002

Q : In limit state approach spacing of main reinforced controls primarily

A : Collapse

B : Cracking

C : Deflection

D : Durability

Q : The final deflection due to all loads including the effects temperature creep and shrinkage and measured from as-cast level of supports of floor, roofs and all other horizontal members should NOT exceed

A : Span/350
B : Span/300
C : Span/250
D : Span/200

Q : Flexural collapse in over reinforced beams is due to

A : Primary compressive failure

B : Secondary compressive failure

C : Primary tension failure

D : Bond failure

Q : When assessing the strength of a structure as per the limit state of collapse, the value of partial safety factor for steel is taken as

A : 2

B : 1.5

C : 1.15

D : 1

Q : Combination of partial safety factors for loads under limit state of collapse and limit state of serviceability will be

A : 1.5(DJ + L.L)or 01.5(D.L + W.L)or 1.2(D.L + L.L) and D.L + 0.8(D.L + W.L)

B : 1.5(D.L + W.L) and D.L + 0.8(L.L + W.L)

C : 1.5(D.L + W.L) or 1.5(D.L + W.L)or 1.2(D.L +L.L + W.L) and 1.0(D.L + L.L)or 1.0(D.L + W.L)or D.L +0.8 (L.L + W.L)

D : 1.2(D.L + L.L + W.L) and 1.0(D.L + L.L)or 1.0(D.L + W.L)or D.L + 0.8(L.L + W.L)

Q : As per IS: 456-1978, the ratio of stress in concrete to its characteristic strength at collapse in flexure for design purposes is taken as

A : 0.67

B : 0.576

C : 0.447

D : 0.138

Q : If modular ratio is 'm' effective depth is D and stress ratio is r($r = \sigma_{at}/\sigma_{abc}$) the depth of neutral axis of a balanced section is

A : $\frac{m}{m-r} . D$

B : $\frac{m}{m+r} . D$

C : $\frac{m+r}{m} . D$

D : $\frac{m}{r} . D$

Q : Partial safety factor for concrete and steel are 1.5 and 1.15 respectively, because

A : Concrete is heterogeneous while steel is homogeneous

B : The control on the quality of concrete is not as good as that of steel

C : Concrete is weak in tension

D : Voids in concrete are 0.5% while those in steel are 0.15%

Q : As compared to working stress method of design limit state method takes concrete to

A : A high stress level

B : A lower stress level

C : The same stress level

D : Sometimes higher but generally lower stress level.

Q : As per IS: 456 for a singly reinforced recangular section,

A : S_u. max/d for Fe415 steel is 0.48

B : The depth of centroid of compression is 0.43 S_u.max

C : The depth of the recangular portion of the stress block is 0.38 X_u.max

D : The maximum value of lever arm d-x

Q : Consider the following statements the design for the limit state of collapse in flexure is based on the following assumption:

1. Plane sections normal to the axis remain plane after bending.
2. The maximum strain in concrete at the outermost tension fibre is 0.0035.
3. The relationship between the compressive stress distribution in concrete and the strain in concrete may be assumed to be recangular, trapezoidal parabolic or any other shape which results in prediction of strength in substantial agreement with the result of tests.

Select the correct answer using the codes given below:

A : 1 and 3
B : 1,2 and 3
C : 2 and 3
D : 1 and 2

Q : The probability of failure implied in limit state design of the design is of the order of

A : 10^{-2}

B : 10^{-3}

C : 10^{-4}

D : 10^{-5}

Q : If σ_{cbc} is permissible compressive stress in flexural compression in N/mm^2 in service, the modular ration is of the order of

A : $280/3\sigma_{cbc}$

B : $280/4\sigma_{cbc}$

C : 19

D : 13

Q : Long term elastic modulus in term of creep coefficient (9) and 28-day characteristic strength (F_{ck})is given by

A : $\frac{5000\sqrt{f_{ck}}}{1+\theta} MPa$

B : $\frac{50000\sqrt{f_{ck}}}{1+\theta} MPa$

C : $\frac{5000\sqrt{f_{ck}}}{1+\sqrt{\theta}} MPa$

D : $\frac{5000\sqrt{f_{ck}}}{\sqrt{1+\theta}} MPa$

Q : What should be the minimum grade of reinforced concrete in and around sea coast construction?

A : M 35

B : M 30

C : M 25

D : M 20

Q : Match List - I with List- II and select the correct answer:

List -I	List - II
A. Service ability	1. Sliding
B. Shear key	2. Deflection
C. shrinkage	3. Cracking
D. Concrete spalling	

Codes:

A : A-1, B-3, C-4, D-2

B : A-2, B-1, C-3, D-4

C : A-1, B-3, C-2, D-4

D : A-2, B-1, C-4, D-3