CIVIL ENGINEERING COMPETITIVE QUESTIONS

S.No. Question

1 Concrete contains

(i)Siliceous aggregates, having higher coefficient of expansion

(ii)Igneous aggregates, having intermediate coefficient of expansion

(iii)Lime stones, having lowest coefficient of expansion

[A] i and iii

[B] ii and iii

[C] i and ii

[D] i, ii and iii

Answer : D

2 Select the incorrect statement

[A] R.C.C has better fire resistance than steel

[B] R.C.C. structure is economical than steel structure

[C] Strength of concrete decreases as age increases

[D] R.C.C can be used for under water and marine structures

Answer : C

3 Water cement ratio is the ratio of

[A] Water to cement by weight

[B] Water to cement by volume

[C] Cement to water by weight

[D] Cement to water by volume

Answer : A

4 Concrete is

[A] Weak in tension

[B] Strong in tension

[C] Strong in both tension and compression

[D] Weak in compression

Answer : A

5 The entrained air in concrete

[A] Increases the strength

[B] Decreases the resistance to weathering

[C] Increases the workability

[D] Decreases the workability

Answer : C

6 Concrete is unsuitable for compaction by vibration if it is

[A] Semi – plastic

[B] Plastic

[C] Earth moist

[D] Dry

Answer : B

7 The strength and quality of concrete depends upon

(i)Grading of aggregates

(ii)Shape of aggregates

(iii)Surface area of aggregates

(iv)Surface texture of aggregates

[A] i, ii and iv

[B] ii, iii and iv

[C] i, iii and iv

[D] i, ii, iii and iv

Answer : D

8 In order to avoid segregation, fresh concrete should be dropped from a height of

[A] Less than one meter

[B] Less than two metres

[C] More than one metre

[D] More than two metres

Answer : A

9 The process of hardening of concrete in the presence of water is called

[A] Creep

[B] Hydration

[C] Shrinkage

[D] Curing

Answer : B

10 The process of keeping the concrete structure moist is called

[A] Hydration

[B] Curing

[C] Creep

[D] Shrinkage

Answer : B

11 The separation of water or water cement mixture from the freshly laid concrete is known as

[A] Workability

[B] Segregation

[C] Bleeding

[D] Creep

Answer : C

12 The continuous strain, which the concrete undergoes due to application of external loads is called

[A] Creep

[B] Bleeding

[C] Workability

[D] Segregation

Answer : A

13 The process of conversion of plastic concrete to solid stage is called

[A] Hydration

[B] Hardening

[C] Setting

[D] Curing

Answer : C

14 At 28 days of curing concrete attains a strength of

[A] 20 to 25%

[B] 60 to 70%

[C] 65 to 80%

[D] 90 to 95%

Answer : D

15 In a mass concrete, the aggregates occupy a space of

[A] 25%

[B] 75%

[C] 40%

[D] 60%

Answer : B

16 The coarse aggregate which possess the property of good interlocking are

[A] rounded shape

[B] elongated shape

[C] angular shape

[D] none of the above

Answer : C

17 While placing of concrete the thickness of each layer for R.C.C. is

[A] 150 to 300 mm

[B] 450 mm

[C] 500 to 750 mm

[D] 500 mm

Answer : A

18 Increase in water content in a cement concrete

(i) Increases workability

(ii) Increases the strength

[A] i

[B] ii

[C] both (i) and (ii)

[D] neither (i) nor (ii)

Answer : A

19 Slump cone test is used to determine

[A] Shrinkage of concrete mix

[B] Creep of concrete

[C] Workability of concrete mix

[D] Soundness of concrete

Answer : C

20 While determining the workability of concrete mix, the compaction factor test is ------than the slump cone test

[A] Less accurate

[B] More accurate

[C] Approximate method

[D] None of the above

Answer : B

21 Workability of concrete mix with low water cement ratio is determined by

[A] Tensile strength test

[B] Slump cone test

[C] Compaction factor test

[D] Flexural strength test

Answer : C

22 If the slump of a concrete mix is 50 to 100 mm, its workability is

[A] Very low

[B] Low

[C] Medium

[D] High

Answer : C

23 A compaction factor of 0.75 indicates _____workability

[A] Very low

[B] Low

[C] Medium

[D] High

Answer : A

24 Shrinkage in concrete can be reduced by using

(i) Low water cement ratio (ii) More amount of cement in the concrete

(iii) Presaturated aggregates

[A] i

[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : C

25 The process of proper and accurate measurement of concrete ingredients for uniformity of proportion, is known as

[A] Curing

[B] Mixing

[C] Grading

[D] Batching

Answer : D

26 Select incorrect statement from the following

[A] With passage of time, the strength of cement decreases

[B] With passage of time, the strength of cement increases

[C] After a period of 24 months, the strength of cement reduces to 50%

[D] The concrete made with storage deteriorated cement; gains strength with time.

Answer : B

27 For compacting plain concrete road surface of thickness less than 20 cm, the following vibrator is used.

[A] Internal vibrator

[B] Screed vibrator

[C] Form vibrator

[D] None of the above

Answer : B

28 Slump test of concrete is a measure of its

[A] Consistency

[B] Compressive strength

[C] Tensile strength

[D] Impact value

Answer : A

29 Concrete gains strength due to

[A] Chemical reaction of cement with sand and coarse aggregates

[B] Evaporation of water from concrete

[C] Hydration of cement

[D] All the above

Answer : C

30 Minimum grade of concrete for R.C.C. should be _____ , as per IS. 456-2000

[A] M10

[B] M14

[C] M20

[D] M25

Answer : C

31 A concrete mass containing 5% of voids

[A] Increases its strength by 30%

[B] Reduces its strength by 30%

[C] Increases its strength by 5%

[D] Reduces its strength by 5%

Answer : B

32 Workability of a concrete – mix is determined by

(i)Slump cone test

(ii)Compaction factor test

(iii)Vee bee test

[A] i

[B] ii

[C] i and ii

[D] i, ii and iii

Answer : D

33 High strength of concrete requires a water cement ratio of

[A] 0.10 to 0.15

[B] 0.25 to 0.30

[C] 0.45 to 0.60

[D] 0.75 to 0.90

Answer : B

34 One bag of cement is equivalent to

[A] 50 litres

[B] 35 litres

[C] 28 litres

[D] 14 litres

Answer : B

35 One cubit metre of cement weights

[A] 1000 kg

[B] 1200 kg

[C] 1440 kg

[D] 1600 kg

Answer : C

36 As per IS: 456-2000, modulus of elasticity of concrete (in N/mm2) is given by

[A] 5700 vfCK

[B] 5000 vfCK

[C] 3700 vfCK

[D] 3000 vfCK

Answer : B

37 In working stress method of design, the factor of safety for concrete and steel respectively are

[A] 3.0 and 1.8

[B] 3.0 and 1.18

[C] 3.0 and 1.15

[D] 1.5 and 1.5

Answer : A

38 In Limit state method of design, the factor of safety for concrete and steel respectively are

[A] 3.00 and 1.80

[B] 1.50 and 1.18

[C] 1.50 and 1.15

[D] 1.50 and 1.50

Answer : C

39 Specific weight of Reinforced cement concrete is

[A] 24 N/m3

[B] 24 kN/m3

[C] 25 N/m3

[D] 25 kN/m3

Answer : D

40 The tensile strength of concrete is about _____ of its compressive strength

[A] 10% to 15%

[B] 30% to 40%

[C] 50%

[D] 60% to 75%

Answer : A

41 The shrinkage strain of concrete is generally taken as

[A] 0.3

[B] 0.03

[C] 0.003

[D] 0.0003

Answer : D

42 The tensile strength of concrete is given by

[A] 0.45 vfCK

[B] 0.60 vfCK

[C] 0.70 vfCK

[D] 0.90 vfCK

Answer : C

43 The ratio of bond stress for HYSD bars to that of plain bars

[A] 0.714

[B] 0.9

[C] 1.4

[D] 1.8

Answer : C

44 The proof stress in steel is the stress corresponding to the strain of

[A] 0.2

[B] 0.02

[C] 0.002

[D] 0.0002

Answer : C

45 In the mixer, the concrete should be mixed for at least

[A] 1 to 2 minutes

[B] 2 to 3 minutes

[C] 3 to 5 minutes

[D] 5 to 7 minutes

Answer : B

46 As per IS: 456-2000, the maximum size of aggregate is

[A] 1/4 of maximum thickness of member

[B] 1/4 of minimum thickness of member

[C] 1/5 of maximum thickness of member

[D] 1/5 of minimum thickness of member

Answer : B

47 Water used for mixing of concrete should be free from

(i)Oils

(ii)Salts

(iii)Acids

[A] i

[B] iii

[C] i and iii

[D] i, ii and iii

Answer : D

48 Modulus of elasticity of concrete is primarily influenced by

[A] Elastic properties of aggregate

[B] Curing of concrete

[C] Age of concrete

[D] Mix proportion and type of cement

Answer : A

49 As the workability increases compaction factor

[A] Decreases

[B] Increases

[C] Remains same

[D] None of the above

Answer : B

50 Shrinkage of concrete is mostly influenced by

[A] Environmental conditions

[B] Size of member

[C] Cement in concrete

[D] The total amount of water present in concrete

Answer : D

51 During the process of hardening of cement, _____ will takes place

[A] Bleeding

[B] Segregation

[C] Hydration

[D] All the above

Answer : C

52 Due to Bleeding action concrete becomes

[A] Weak

[B] Strong

[C] Hard

[D] Durable

Answer : A

53 About 70% to 80% of cement is contributed by

[A] Tricalcium silicate and Tricalcium aluminate

[B] Tricalcium silicate and Dicalcium silicate

[C] Tricalcium Aluminate and Dicalcium silicate

[D] Tricalcium Aluminate and Tetra calcium Aluminoferrite

Answer : B

54 When compared to ordinary Portland cement, Rapid hardening Portland cement contains _____ amount of lime content

[A] Equal

[B] Greater

[C] Lesser

[D] Zero

Answer : B

55 The following compound has the property of early strength as well as ultimate strength

[A] C3S

[B] C2S

[C] C3A

[D] C4AF

Answer : A

56 Which of the following compounds is considered to be an undesirable compound for cement

[A] C3S

[B] C2S

[C] C3A

[D] C4AF

Answer : D

57 Which of the following compound is susceptible to be attached by alkalies and salts

[A] C3S

[B] C3S

[C] C3A

[D] C3AF

Answer : C

58 The heat generated in ordinary cement at the end of 3 days is about

[A] 60 cal/g

[B] 80 cal/g

[C] 100 cal/g

[D] 120 cal/g

Answer : B

59 Low heat cement contains more amount of _____ than that of ordinary Portland cement

[A] C3S

[B] C2S

[C] C3A

[D] None of the above

Answer : B

60 In Portland Blast furnace slag cement, the blast furnace slag content shall not exceed

[A] 50%

[B] 65%

[C] 80%

[D] 90%

Answer : B

61 White cement contains less amount of _____

[A] Lime

[B] Silica

[C] Alumina

[D] Iron oxide

Answer : D

62 In fineness test on cement, residue left on I.S. sieve no.9 shall not exceed _____ by weight of the sample of cement

[A] 5%

[B] 10%

[C] 15%

[D] 20%

Answer : B

63 Ordinary Portland cement requires a specific surface of

[A] 1250 cm2/gm

[B] 2250 cm 2/gm

[C] 3250 cm 2/gm

[D] 3500 cm 2/gm

Answer : B

64 The maximum percentage of chemical ingredient of cement is

[A] Iron oxide

[B] Silica

[C] Lime

[D] Magnesium oxide

Answer : C

65 The minimum percentage of chemical ingredient of cement is

[A] Iron oxide

[B] Silica

[C] Lime

[D] Magnesium oxide

Answer : D

66 Efflorescence in cement is caused due to an excess of

[A] Alkalies

[B] Silica

[C] Iron oxide

[D] Alumina

Answer : A

67 Dicalcium silicate (C2S)

[A] rates rapidly

[B] Hardens rapidly

[C] Generates less heat of hydration

[D] Has less resistance to sulphate attack

Answer : C

68 Tricalcium aluminate (C3A)

[A] Hydrating less rapidly

[B] Is a redundant compound

[C] To be attacked by alkalies and salts

[D] None of these

Answer : C

69 For road pavements, the cement generally used, is

[A] Ordinary Portland cement

[B] Rapid hardening cement

[C] Low heat cement

[D] Blast furnace slag cement

Answer : A

70 For mass concrete work, the type of cement preferable is

[A] Ordinary Portland cement

[B] Rapid hardening cement

[C] Low heat cement

[D] Blast furnace slag cement

Answer : C

71 Le-chatelier apparatus is used for

[A] Fineness test

[B] Consistency test

[C] Soundness test

[D] Compressive strength test

Answer : C

72 The diameter of the Vicat plunger is 10 mm and its length varies form

[A] 40 mm

[B] 50 mm

[C] 55 mm

[D] 60 mm

Answer : B

73 Inert material of a cement concrete mix, is

[A] Water

[B] Aggregate

[C] Cement

[D] None of these

Answer : B

74 An aggregate is said to be flaky, if its least dimension is less than

[A] 2/3 mean dimension

[B] 3/4 mean dimension

[C] 3/5 mean dimension

[D] 5/8 mean dimension

Answer : C

75 Workability of concrete for a given water content is good, if the aggregates are

[A] Rounded

[B] Irregular

[C] Angular

[D] Flaky

Answer : A

76 Setting time of cement increases by adding

(i)gypsum

(ii)sodium oxide

(iii)calcium chloride

[A] i

[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : A

77 The cement becomes useless if its absorbed moisture content exceeds

[A] 1%

[B] 2%

[C] 3%

[D] 5%

Answer : D

78 The size of fine aggregates does not exceed

[A] 2.75 mm

[B] 3.75 mm

[C] 4.75 mm

[D] 5.75 mm

Answer : C

79 Water used for mixing concrete should be

[A] Slightly acidic

[B] Free from bacteria

[C] Distilled

[D] Potable

Answer : D

80 The workability of concrete is mostly influenced by its

[A] Water cement ratio

[B] Aggregate cement ratio

[C] Cement content

[D] Water content

Answer : A

81 Chief constituent of ordinary Portland cement is

[A] Lime

[B] Alumina

[C] Magnesia

[D] Iron oxide

Answer : A

82 The heat of hydration for low heat cement at the age of 7 days shall not exceed

[A] 80 cal / gm

[B] 75 cal / gm

[C] 70 cal / gm

[D] 65 cal / gm

Answer : D

83 Cement is obtained by burning a mixture of the following materials

[A] Siliceous materials

[B] Argillaceous materials

[C] Calcareous materials

[D] All the above

Answer : D

84 For determining the compressive strength test on cement is, the percentage amount of water to be added as (Pa = Percentage of water for required consistency)

[A] 0.25 Pa + 2.5

[B] 0.25 Pa + 3.5

[C] 0.35 Pa + 2.5

[D] 0.35 Pa + 3.5

Answer : B

85 Minimum compressive strength of cement required at the age of 3 days for ordinary Portland cement of grade 33 is

[A] 1.15 N/mm2

[B] 11.5 N/mm2

[C] 2.10 N/mm2

[D] 21 N/mm2

Answer : B

86 Bulking of sand takes place due to

[A] Surface tension

[B] Viscosity

[C] Capillarity

[D] None of the above

Answer : A

87 Creep coefficient is the ratio of

[A] Ultimate Creep strain to elastic strain

[B] Elastic strain to ultimate Creep strain

[C] Elastic strain to plastic strain

[D] Plastic strain to elastic strain

Answer : A

88 Generally the strength of concrete is represented by the crushing stress of concrete cube of size

[A] 50 mm

[B] 100 mm

[C] 150 mm

[D] 250 mm

Answer : C

89 As per IS:1139, the characteristic yield strength for hot rolled High yield strength deformed bars is

[A] 250 N/mm2

[B] 415 N/mm2

[C] 500 N/mm2

[D] 550 N/mm2

Answer : B

90 As per IS:1139, the characteristic yield strength for cold twisted deformed bars is

[A] 250 N/mm2

[B] 415 N/mm2

[C] 500 N/mm2

[D] 550 N/mm2

Answer : C

91 For reinforced concrete work, aggregates having a nominal size of -------- are generally used

[A] 20 mm

[B] 40 mm

[C] 50 mm

[D] 60 mm

Answer : A

92 The proportion of coarse aggregates to fire aggregates in structural concrete is usually

[A] 0.50 - 1.25

[B] 1.25 - 4.50

[C] 1.50 - 2.50

[D] 0.25 - 0.75

Answer : C

93 Fly ash when added to concrete

[A] Acts as aggregates

[B] Acts as pozzolona

[C] Improves appearance

[D] Reduces setting time

Answer : B

94 As per IS:456, the strength of concrete sample is less than

[A] The characteristic strength minus 1.35times the standard deviation

[B] 0.80 times the characteristic strength

[C] Greater of (a) and (b)

[D] None of the above

Answer : C

95 Characteristic strength of steel has been defined as

[A] 0.1 % proof stress

[B] 0.2 % proof stress

[C] 0.4 % proof stress

[D] Equal to proof stress

Answer : B

96 For Ordinary Portland cement concrete exposed to dry and hot weather conditions, good moist curing period is

[A] 7 days

[B] 10 days

[C] 14 days

[D] None of the above

Answer : B

97 As per IS: 456-2000, recommended value for standard deviation for concrete mix from M30 to M50 is

[A] 1 N/mm2

[B] 2 N/mm2

[C] 4 N/mm2

[D] 5 N/mm2

Answer : D

98 As per 1S: 456-2000, minimum grade of concrete in seat water constructions is

[A] M20

[B] M25

[C] M30

[D] M50

Answer : C

99 The section of a reinforced beam where most distant concrete fiber in compression and tension in steel attains permissible stresses simultaneously is called

(i)Balanced section

(ii)Economic section

(iii)Critical section

[A] i

[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : D

100 As the percentage of steel increases

[A] Depth of neutral axis decreases

[B] Depth of neutral axis increases

[C] Lever arm increases

[D] None of the above are correct

Answer : B

101 In a Singly reinforced beam, if the permissible stress in concrete reaches earlier than that in steel, the beam section is called

[A] Under reinforced section

[B] Over reinforced section

[C] Balanced section

[D] Critical section

Answer : B

102 The neutral axis corresponding to balanced section condition is termed as

[A] Critical neutral axis

[B] Centroidal neutral axis

[C] Balanced neutral axis

[D] All the above

Answer : A

103 In a singly reinforced beam, if the permissible stress in steel reaches earlier than that of concrete, the beam section as called

[A] Under reinforced section

[B] Over reinforced section

[C] Balanced section

[D] Critical section

Answer : A

104 The depth of neutral axis for under reinforced section is --------- the depth of critical neutral axis

[A] Equal to

[B] Greater than

[C] Less than

[D] None of the above

Answer : C

105 The depth of neutral axis for over reinforced section is ---------- the depth of critical neutral axis

[A] Equal to

[B] Greater than

[C] Less than

[D] None of the above

Answer : B

106 For a balanced section, the tensile stress in the reinforcement

[A] reaches its allowable stress

[B] is always less than its allowable stress

[C] may be greater than its allowable stress

[D] none of the above

Answer : A

107 The depth of neutral axis for a balanced section is --------- the depth of critical neutral axis

[A] equal

[B] always greater than

[C] always less than

[D] may be sometimes greater than

Answer : A

108 Moment of resistance for a under reinforced section --------- that of a critical section

[A] Is equal to

[B] Is always greater than

[C] Is less than

[D] May be sometimes greater than

Answer : C

109 By over-reinforcing a beam, the moment of resistance can be increased not more than

[A] 10%

[B] 15%

[C] 25%

[D] 50%

Answer : C

110 The working stress method is also known as

[A] Elastic method

[B] Load factor method

[C] Critical method

[D] All the above

Answer : A

111 Working stress method of design results in ---------- percentages of compression steel than that of a limit state method of design

[A] Equal

[B] Larger

[C] Smaller

[D] Half of the

Answer : B

112 As per IS;456, in working stress method of design, permissible tensile stress for M20 grade concrete is given by

[A] 1. 2 N/mm2

[B] 1.5 N/mm2

[C] 2.0 N/mm2

[D] 2.8 N/mm2

Answer : D

113 In working stress method of design, permissible compressive bending stress for M20 grade concrete is given by

[A] 5.0 N/mm2

[B] 7.0 N/mm2

[C] 10.0 N/mm2

[D] 20 N/mm2

Answer : B

114 As per IS: 456, permissible direct compressive stress M20 grade concrete in working stress method of designer

[A] 5.0 N/mm2

[B] 7.0 N/mm2

[C] 10.0 N/mm2

[D] 20.0 N/mm2

Answer : A

115 As per IS: 456, permissible bond stress for plain bars in tension, in working stress method, where M20, is the grade of concrete

[A] 0.6 N/mm2

[B] 0.8 N/mm2

[C] 1.0 N/mm2

[D] 1.2 N/mm2

Answer : B

116 The bond stress for plain bars in compression is more than that for bars in tension by

[A] 25%

[B] 40%

[C] 60%

[D] 50%

Answer : A

117 The bond stress for deformed bars is more than that in plain bars by

[A] 25%

[B] 40%

[C] 60%

[D] 50%

Answer : B

118 As per IS:456, maximum shear stress for M20 glade concrete in working stress method is

[A] 1.6 N/mm2

[B] 1.8 N/mm2

[C] 2.0 N/mm2

[D] 2.2 N/mm2

Answer : B

119 When the nominal shear stress is less than permissible shear stress in concrete then

[A] Provide minimum shear reinforcement

[B] No shear reinforcement is necessary

[C] Provide design shear reinforcement

[D] None of the above

Answer : A

120 While compared with singly reinforced beams, the depth of doubly reinforced beam is

[A] Greater

[B] Lesser

[C] almost equal

[D] twice

Answer : B

121 If the depth of actual neutral axis is greater than the depth of critical neutral axis, then

[A] Concrete attains its permissible stress earlier

[B] Steel attains its permissible stress earlier

[C] Both concrete and steel reaches its permissible stresses simultaneously

[D] None of the above

Answer : A

122 Steel Beam theory is a method of designing

[A] Balanced sections

[B] Critical sections

[C] Singly reinforced beams

[D] Doubly reinforced beams

Answer : D

123 According to steel Beam theory, stress in compressive steel is ------- stress in tension steel

[A] less than

[B] greater than

[C] equal to

[D] twice

Answer : C

124 According to revised elastic theory, the steel in the compression zone is ------ that which is calculated simple elastic theory

[A] equal to

[B] less than

[C] greater than

[D] half of

Answer : C

125 Maximum area of tension reinforcement shall not exceed

[A] 0.02 bd

[B] 0.02 bD

[C] 0.04 bd

[D] 0.04 bD

Answer : D

126 Maximum area of compression reinforcement shall not exceed

[A] 0.02 bd

[B] 0.02 bD

[C] 0.04 bd

[D] 0.04 bD

Answer : C

127 Side face reinforcement is provided when the depth of beam exceeds

[A] 250 mm

[B] 450 mm

[C] 550 mm

[D] 750 mm

Answer : D

128 The area of side face reinforcement shall not be less than

[A] 0.10 percent of the web area on each vertical face

[B] 0.05 percent of the web area on each vertical face

[C] 0.15 percent of the web area on each vertical face

[D] 0.20 percent of the web area

Answer : B

129 The maximum of spacing of side face reinforcement shall not exceed

[A] 300 mm

[B] Web thickness

[C] Lesser of (a) and (b)

[D] Greater of (a) and (b)

Answer : C

130 A concrete block subjected to shear stresses, then the failure may result by

[A] Diagonal tension

[B] Longitudinal tension

[C] Diagonal compression

[D] None of the above

Answer : A

131 The anchorage value of the hook for a mild steel bar is generally considered as

(d = diameter of bar)

[A] 8 d

[B] 16 d

[C] 32 d

[D] 48 d

Answer : B

132 As per IS: 1139, permissible stress in compression steel reinforcement for High Yield strength deformed bars is

[A] 140 N/mm2

[B] 190 N/mm2

[C] 230 N/mm2

[D] 415 N/mm2

Answer : B

133 According to IS: 456-2000 spacing of vertical stirrups for shear reinforcement has been limited to

[A] 0.75 d

[B] 450 mm

[C] lesser of 0.75 d or 300 mm

[D] lesser of 0.75d or 450 mm

Answer : C

134 The maximum spacing of main steel in slabs has been limited to

[A] 250 mm

[B] 300 mm

[C] 450 mm

[D] 500 mm

Answer : B

135 Limit state of collapse deals with

[A] strength and stability of the structure

[B] conditions such as deflection, cracking

[C] durability

[D] all the above

Answer : A

136 Limit state method of design has _____ major limit state conditions

[A] one

[B] two

[C] three

[D] four

Answer : B

137 In Limit state design, the maximum working load that the structure has to withstand is called

[A] Service load

[B] Factored load

[C] Characteristic load

[D] Ultimate load

Answer : C

138 The safe strengths for the materials are called their

[A] Ultimate strength

[B] Characteristic strength

[C] Maximum strength

[D] none of the above

Answer : B

139 Partial safety factor for strength of concrete in Limit state design is

[A] 1.15

[B] 1.25

[C] 1.5

[D] 1.65

Answer : C

140 Partial safety factor for strength in steel m Limit state design is

[A] 1.15

[B] 1.25

[C] 1.5

[D] 1.65

Answer : A

141 The stress-strain curve concrete in compression follows

[A] a straight line

[B] a rectangular parabolic curve

[C] a semi circular arc

[D] a cubic parabola

Answer : B

142 The ultimate strain of concrete at failure is

[A] 0.002

[B] 0.0035

[C] 0.0045

[D] 0.006

Answer : B

143 The theoretical stress-strain curve of the concrete in the Limit State design of structures is correspondingly reduced by the factor

[A] 0.35

[B] 0.5

[C] 0.67

[D] 0.75

Answer : C

144 According to IS:456 minimum cement content inclusive of admixtures is

[A] 200 kg/m3

[B] 300 kg/m3

[C] 450 kg/m3

[D] 550 kg/m3

Answer : B

145 According to IS: 456, maximum water-cement ratio should be

[A] 0.45

[B] 0.55

[C] 0.65

[D] 0.75

Answer : B

146 The reduction of the PH value, by the action of atmospheric carbon dioxide with the alkali of the cement paste is called

[A] atmospheric corrosion

[B] chloride corrosion

[C] oxidation

[D] carbonation

Answer : D

147 According to IS:456-2000, the maximum allowable crack width (in mm) for mild type of environmental condition

[A] 0.1

[B] 0.2

[C] 0.25

[D] 0.3

Answer : D

148 According to IS:456-2000, the following type of environments are considered for durability of concrete

[A] two

[B] four

[C] five

[D] six

Answer : C

149 Nominal cover for M30 grade concrete in moderate exposure is (as per IS:456-2000)

[A] 20 mm

[B] 30 mm

[C] 45 mm

[D] 50 mm

Answer : B

150 The main factors affecting the permeability of concrete are

(i)Grade of concrete

(ii)Minimum cement content

(iii)Maximum water cement ratio

[A] i

[B] i and ii

[C] ii and iii

[D] i, ii and iii

Answer : C

151 The pH value of Puzzolanic concrete is _____ that of ordinary concrete

[A] lower than

[B] much lower than

[C] higher than

[D] equal

Answer : B

152 According to IS: 456-2000, the maximum cement content exclusive of admixtures is

[A] 200 kg/m3

[B] 300 kg/m3

[C] 450 kg/m3

[D] 550 kg/m3

Answer : C

153 The curing method is said to be good, when the relative humidity is kept

[A] Greater than 80%

[B] Less than 50%

[C] 50% - 80%

[D] None of the above

Answer : A

154 The maximum amount of chlorides and sulphates should not be more than

[A] 0.15% and 4% by mass of cement respectively

[B] 4% and 0.15% by mass of cement respectively

[C] 0.30% and 2% by mass of cement respectively

[D] 2% and 0.30% by mass of cement respectively

Answer : A

155 According to IS:456-2000, the total acid soluble chlorides in concrete is restricted to_____ of concrete

[A] 0.2 kg/m3

[B] 0.4 kg/m3

[C] 2 kg/m3

[D] 4 kg/m3

Answer : B

156 Minimum cover for fire resistance for a given simply supported beam, when the fire rating is 1 hour---------

[A] 15 mm

[B] 20 mm

[C] 25 mm

[D] 30 mm

Answer : B

157 Modulus elasticity of steel is generally taken as

[A] 2 x 105 N/mm2

[B] 2 x 106 N/mm2

[C] 2 x 106 N/mm2

[D] 2 x 105 N/mm2

Answer : A

158 Which of the following sections are preferable for designing a member

[A] under reinforced sections

[B] over reinforced sections

[C] both (a) and (b)

[D] balanced sections

Answer : A

159 According to IS: 456-2000, limiting value of yield strain for Fe415 grade steel is

[A] 0.031

[B] 0.0031

[C] 0.038

[D] 0.0038

Answer : D

160 According to IS:456-2000, Limiting value of yield strain for Fe250 grade steel is

[A] 0.031

[B] 0.0031

[C] 0.038

[D] 0.0038

Answer : B

161 For economical consideration, the ratio of overall depth to width should be

[A] less than 1.5

[B] between 1.50 and 2.0

[C] between 2.0 to 2.5

[D] greater than 2.5

Answer : B

162 The concrete is assumed to reach failure with a compression strain of

[A] 0.002

[B] 0.0035

[C] 0.0045

[D] 0.006

Answer : B

163 In general in the design of a section by limit method, it is assumed that

[A] the stress in steel to reach its yield limit before concrete failure

[B] the stress in concrete to reach its permissible limit before to reach yield stress in steel

[C] stresses in both concrete and steel reach their permissible values simultaneously

[D] none of the above are correct

Answer : A

164 The expression for moment of resistance(Mu) of a singly reinforced section is, if the grade of steel in Fe415

[A] 0.149 fck bd2

[B] 0.138 fck bd2

[C] 0.125 fck bd2

[D] 0.0120 fck bd2

Answer : B

165 If the grade of steel is Fe250, then the expression for moment of resistance of a singly reinforced section is

[A] 0.149 fck bd2

[B] 0.138 fck bd2

[C] 0.125 fck bd2

[D] 0.012 fck bd2

Answer : A

166 Minimum percentage of tension steel for a singly reinforced section Fe415 grade is

[A] 0.2

[B] 0.35

[C] 2

[D] 3.5

Answer : A

167 Design yield stress for steel in tension and compression is

[A] 0.65 fy

[B] 0.87 fy

[C] 0.75 fy

[D] None of the above

Answer : B

168 Strain compatibility method is the method used for the analysis and design of

[A] singly reinforced sections

[B] doubly reinforced sections

[C] both (a) and (b)

[D] neither (a) nor (b)

Answer : C

169 The spacing of stirrups in doubly reinforced beams should be least of the following

(i)Least Lateral dimension

(ii)Sixteen times the diameter of longitudinal steel

(iii)Forty eight times the diameter of transverse reinforcement

[A] i

[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : D

170 Development length is the length or extension that should be provided on either side from the

[A] face of the support

[B] point of maximum tension

[C] point of maximum compression

[D] point of minimum compression

Answer : B

171 The ultimate average anchorage bond stress for plain bars in tension is _____ if the grade of concrete is M20

[A] 1.60 N/mm2

[B] 1.92 N/mm2

[C] 2.24 N/mm2

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Answer : B

172 The length of bar necessary to develop the full strength of the bar is called

[A] Bond

[B] Development length

[C] End anchorage

[D] Splicing

Answer : B

173 End anchorage of bars is taken as the greater of

[A] Effective depth or 12 times the diameter of bar

[B] Effective depth or 16 times the diameter of bar

[C] Effective depth of 24 times the diameter of bar

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Answer : A

174 Lap splicing are not usually allowed for bars more than

[A] 25 mm

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[C] 36 mm

[D] None of the above

Answer : C

175 Flanged beams are preferred when the concrete in the slab is on the

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[C] may be compression side or tension side of the beam

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Answer : A

176 The development length of bars in compression is taken as

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Answer : A

177 Steel Beam theory is the method of analysis and a design of

[A] Singly reinforced sections

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[D] Steel structures only

Answer : B

178 Limit state of collapse deals with

[A] strength and stability of the structure

[B] conditions such as deflection, cracking

[C] durability

[D] all the above

Answer : A

179 Limit state method of design has _____ major limit state conditions

[A] one

[B] two

[C] three

[D] four

Answer : B

180 In Limit state design, the maximum working load that the structure has to withstand is called

[A] Service load

[B] Factored load

[C] Characteristic load

[D] Ultimate load

Answer : C

181 The safe strengths for the materials are called their

[A] Ultimate strength

[B] Characteristic strength

[C] Maximum strength

[D] none of the above

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182 Partial safety factor for strength of concrete in Limit state design is

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Answer : A

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Answer : B

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Answer : C

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(i)Least Lateral dimension

(ii)Sixteen times the diameter of longitudinal steel

(iii)Forty eight times the diameter of transverse reinforcement

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[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : D

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[B] point of maximum tension

[C] point of maximum compression

[D] point of minimum compression

Answer : B

214 The ultimate average anchorage bond stress for plain bars in tension is _____ if the grade of concrete is M20

[A] 1.60 N/mm2

[B] 1.92 N/mm2

[C] 2.24 N/mm2

[D] 2.40 N/mm2

Answer : B

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[A] Bond

[B] Development length

[C] End anchorage

[D] Splicing

Answer : B

216 End anchorage of bars is taken as the greater of

[A] Effective depth or 12 times the diameter of bar

[B] Effective depth or 16 times the diameter of bar

[C] Effective depth of 24 times the diameter of bar

[D] Effective depth of 48 times the diameter of bar

Answer : A

217 Lap splicing are not usually allowed for bars more than

[A] 25 mm

[B] 32 mm

[C] 36 mm

[D] None of the above

Answer : C

218 Flanged beams are preferred when the concrete in the slab is on the

[A] compression side of the beam

[B] tension side of the beam

[C] may be compression side or tension side of the beam

[D] none of the above

Answer : A

219 The development length of bars in compression is taken as

[A] 30 times bar diameter

[B] 40 times bar diameter

[C] 50 times bar diameter

[D] 12 times bar diameter

Answer : A

220 Steel Beam theory is the method of analysis and a design of

[A] Singly reinforced sections

[B] Doubly reinforced sections

[C] Both (a) and (b)

[D] Steel structures only

Answer : B

221 Bending shear is sometimes referred to as

[A] One way shear

[B] Punching shear

[C] Two way shear

[D] None of the above.

Answer : A

222 Design shear strength of concrete is a function of

i.Percentage of tension steel

ii.Grade of concrete

iii.Grade of steel

[A] i and ii

[B] ii only

[C] i and iii

[D] i, ii and iii

Answer : A

223 Maximum allowable shear stress for M25 grade concrete is

[A] 2.5 N/mm2

[B] 2.8 N/mm2

[C] 3.1 N/mm2

[D] 3.5 N/mm2

Answer : C

224 Minimum shear reinforcement is necessary to

[A] Prevent brittle shear failure

[B] Prevent failure due to shrinkage and thermal stresses

[C] Hold the reinforcements in place while pouring concrete

[D] All the above.

Answer : D

225 Maximum allowable spacing of shear reinforcement for vertical stirrups is restricted to

[A] d

[B] 0.45 d

[C] 0.75 d

[D] 0.90 d

Answer : C

226 According to IS: 456-2000 Maximum spacing of shear reinforcement in no case shall not exceed

[A] 250 mm

[B] 300 mm

[C] 350 mm

[D] 450 mm

Answer : B

227 Maximum allowable spacing of shear reinforcement for inclined stirrups with an inclination of 45° is restricted to

[A] 0.75 d

[B] 0.45 d

[C] 0.90 d

[D] d

Answer : D

228 The diameter of the stirrups according to IS : 456-2000 should not be less than

[A] 5 mm

[B] 6 mm

[C] 8 mm

[D] 10 mm

Answer : B

229 The Maximum shear stress in Slabs should not exceed -------- the maximum values allowed for beams.

[A] Half Of

[B] One-Fourth Of

[C] Twice

[D] Those Given In

Answer : A

230 The principle used for control of deflection in beams and slabs.

[A] Maxwell method

[B] Mohr's theorem

[C] Span to effective depth ratio

[D] Span to overall depth ratio.

Answer : C

231 Basic value .of Span to Depth ratio for cantilever to control deflection is

[A] 7

[B] 20

[C] 26

[D] 35

Answer : A

232 Allowable crack width for reinforce concrete structure under normal conditions is

[A] 0

[B] 0.1 mm

[C] 0.2 mm

[D] 0.3 mm

Answer : D

233 The Minimum bar spacing should not be less than

[A] Diameter of the largest bar

[B] Maximum size of aggregate

[C] Greater of diameter of the largest bar and maximum size of aggregate

[D] Greater of diameter of the largest bar and maximum size of aggregate plus 5 mm

Answer : D

234 The Maximum spacing of Main reinforcement ‘m’ slabs shall be

[A] Less than three times of the effective depth

[B] Less than 300mm

[C] Smaller of (a) and (b)

[D] Greater of (a) and (b)

Answer : C

235 Basic value of span to depth ratio for simply supported beam to control deflection is

[A] 7

[B] 20

[C] 26

[D] 35

Answer : B

236 The Maximum spacing of Secondary reinforcement in slabs should be

[A] Less than 450 mm

[B] Less than 300 mm

[C] Smaller of three times the effective depth and 450 mm

[D] Smaller of five times the effective depth and 450 mm

Answer : D

237 The basic value of span to depth ratio for one way continuous slab is

[A] 20

[B] 26

[C] 35

[D] 40

Answer : B

238 The Minimum amount of steel for Main reinforcement in slab should be (Fe 415- grade of steel)

[A] 0.12 percent of gross cross sectional area

[B] 0.15 percent of gross cross sectional area

[C] 0.20 percent of gross cross sectional area

[D] 0.25 percent of gross cross sectional area.

Answer : A

239 The Maximum percentage of steel in tension allowed for beams

[A] 0.2

[B] 0.4

[C] 2

[D] 4

Answer : A

240 The Maximum diameter steel in slabs should not exceed --------- the total thickness of the slab

[A] One-half

[B] One-fourth

[C] One-eighth

[D] One-sixteenth

Answer : C

241 Minimum steel in the main direction of a slab when using high yield steel

[A] 0.12%

[B] 0.15%

[C] 0.20%

[D] 0.25%

Answer : B

242 Maximum percentage of steel in compression should be

[A] 0.20%

[B] 0.40%

[C] 2.00%

[D] 4.00%

Answer : D

243 Minimum percentage area of tension reinforcement , when the grade of steel is Fe-250

[A] 0.2

[B] 0.25

[C] 0.34

[D] 0.44

Answer : C

244 Select the incorrect from the following.

The combinations of loads for serviceability conditions should be

[A] 1.0 DL + 1.0 LL

[B] 1.0 DL + 1.0 WL

[C] 1.0 DL + 0.8 LL + 0.8 WL

[D] 0.8 DL + 0.8 LL + 0.8 WL

Answer : D

245 In moderate exposure , the allowable crack width at the surface of concrete should be

[A] 0.20 mm

[B] 0.30 mm

[C] 0.45 mm

[D] 0.55 mm

Answer : A

246 For Fe- 415 steel and M20grade concrete, the balanced percentage of steel is

[A] 0.65%

[B] 0.75%

[C] 0.86%

[D] 0.96%

Answer : D

247 According to IS : 456-2000, clause 39.4, stirrups should be provided for a shear of

[A] at least 75%

[B] at least 50%

[C] at least 25 %

[D] none of the above.

Answer : B

248 For ductility consideration, the maximum percentage of steel used should not exceed ------- of the balanced steel

[A] 25%

[B] 50%

[C] 60%

[D] 75%

Answer : D

249 Minimum steel required in slabs is mainly controlled by the following consideration

[A] Cracking on the tension side

[B] Shrinkage and creep

[C] Both (a) and (b)

[D] None of the above.

Answer : B

250 Secondary steel has to be provided across_____ of flanged beams

[A] Full effective width of flange

[B] The width of web

[C] Half of the width of flange

[D] None of the above.

Answer : A

251 The Percentage of steel in T-beam mainly based on

[A] Flange width

[B] Rib width

[C] Flange depth

[D] None of the above.

Answer : B

252 The span/effective depth ratio is ---------- for control of deflection

[A] An exact method

[B] An empirical method

[C] An accurate method.

[D] Both (a) and (c)

Answer : B

253 Basic values of span/effective depth ratios to be used for beams and slabs with spans

[A] Less than 10m

[B] Less than 20 m

[C] 10 m- 20 m

[D] More than 20 m

Answer : A

254 In “Severe exposure” the allowable crack width at the surface of concrete should not exceed

[A] 0.1 mm

[B] 0.2 mm

[C] 0.3 mm

[D] 0.4 mm

Answer : A

255 The minimum percentage of tension steel is mainly based on the

[A] Total depth

[B] Effective depth

[C] Both (a) and (b)

[D] None of the above.

Answer : A

256 The Minimum percentage of secondary steel in slabs for Fe- 415 grade steel should be _____ of Gross cross-section area

[A] 0.12%

[B] 0.15%

[C] 0.20%

[D] 0.25%

Answer : A

257 In order to achieve economy, the spacing of stirrups at mid span section---------- compared to that of support section

[A] May be decreased

[B] May be increased

[C] Must be kept equal

[D] None of the above.

Answer : B

258 Side face reinforcement shall not exceed

[A] 0.1% of total cross sectional area

[B] 0.2% of total cross sectional area

[C] 0.1% web area

[D] 0.2 % web area.

Answer : C

259 To develop complete yield line pattern the slab must be

[A] Under reinforced

[B] Over reinforced

[C] Both (a) and (b)

[D] None of the above.

Answer : A

260 Which of the following is not a characteristic feature of yield lines?

[A] Yield lines end at a slab boundary

[B] Yield lines are of parabolical shape

[C] Axes of rotation generally lie along the lines of supports

[D] None of the above.

Answer : B

261 Negative yield line form

i. Near the supports in the case of slabs fixed or continuous at the edge.

ii. At mid span in the case of slabs fixed.

iii.At mid span for simply supported circular slab

[A] i

[B] i and ii

[C] i and iii

[D] i, ii and iii

Answer : A

262 The yield line ultimate moment is obtained when the yield line is ---------- to the direction of the reinforcement

[A] Parallel

[B] At right angles.

[C] Passes through

[D] Crosses at an angle of 45°

Answer : B

263 The ultimate load capacity of slabs can be determined by using the principle of

i.Super position

ii.Virtual work

iii. Equilibrium

[A] i

[B] ii

[C] i and iii

[D] ii and iii

Answer : D

264 Select incorrect statement from the following.

In the Virtual work method, it is generally assumed that

[A] Elastic deformations in the slab are negligible

[B] Plastic deformations in the slab are negligible

[C] Plastic deformations takes place at the yield lines

[D] Both (a) and (b)

Answer : B

265 Virtual work method and equilibrium method gives ---------- to the collapse load on the slab

[A] Upper bound

[B] Lower bound

[C] Upper bound and lower bound respectively

[D] None of the above.

Answer : A

266 It is essential that the all possible yield line patterns have to be investigated to find the ----------

[A] Highest value of the ultimate load

[B] Lowest value of the ultimate load

[C] Average value of all the loads.

[D] None of the above.

Answer : B

267 The virtual work method is based on the principle

[A] External work done = Internal work done.

[B] External work done + Internal work done.

[C] External work done - Internal work done.

[D] None of the above.

Answer : A

268 Yield line analysis by equilibrium method gives ---------- to that of obtained by virtual work method

[A] Equal values

[B] Lesser values

[C] Higher values

[D] None of the above.

Answer : A

269 Yield line theory results in

[A] Elastic solution

[B] Lower bound solution

[C] Upper bound solution

[D] Unique solution

Answer : B

270 The assumed yield line pattern is to be correct when the lower bound solution ---------the upper bound solution

[A] May be greater than

[B] May be less than

[C] Will coincide with

[D] Must be less than

Answer : C

271 The slab is said to be orthotropically reinforced , when the reinforcement is arranged in;

[A] Single direction

[B] Two directions at right angles with equal meshes

[C] Two directions at right angles with unequal meshes

[D] At the corners only

Answer : C

272 The percentage of reinforcement in slabs is generally in the range of

[A] 0.3% to 0.5%

[B] 0.5% to 1.0%

[C] 1.0% to 1.5%

[D] 1.5 % to 2.0%

Answer : A

273 In general, the depth of slab should be ---------- the minimum depth required for balanced section.

[A] Equal to

[B] Less than

[C] Greater than

[D] Half of

Answer : C

274 It is preferable, that the design of slab should result in

[A] A balanced section

[B] An under reinforced section

[C] Over reinforced section

[D] None of the above.

Answer : B

275 In a two way slab flexural bending develops

[A] Along short span

[B] Along long span

[C] In Mutually perpendicular directions

[D] At the center of short span

Answer : C

276 Slabs which are supported in such a way that the corners are prevented from lifting are referred to as;

[A] One way slabs

[B] Two way slabs

[C] Restrained slabs

[D] Unrestrained slabs.

Answer : C

277 The size of the mesh at each corner meant for torsion reinforcement in a rectangular slab of size (Lx ´ Ly) is

Lx = shorter span

Lx = Longer span

[A] 0.1 Ly x 1 Ly

[B] 0.2 Ly x 0.2 Ly

[C] 0.1 Lx x 0.1 Lx

[D] 0.2 Lx x 0.2 Lx

Answer : D

278 The span/over all depth ratio for a simply supported two-way slab according to IS : 456-2000 is given by

[A] 20

[B] 28

[C] 32

[D] 40

Answer : B

279 According to IS: 456-2000, the span/overall depth ratio for a continuous two-way slab in order to control deflection is given by

[A] 20

[B] 28

[C] 32

[D] 40

Answer : C

280 Reinforced concrete slab supported only on columns is said to be

[A] Rigid slab

[B] Flat slab

[C] Both(a) and (b)

[D] None of the above.

Answer : B

281 According to IS: 456-2000 the ultimate moment of resistance of a slab for Fe - 415 HYSD bars is;

[A] Mu = 0.138 fck bd2

[B] Mu = 0.145 fck bd2

[C] Mu = 0.152 fck bd2

[D] Mu = 0.165 fck bd2

Answer : A

282 In a limit state method of design, when shear reinforcement is not provided, the calculated shear stress at the critical section of a slab shall not exceed;

[A] Ks 0.25 v fck

[B] ks 0.20 v fck

[C] ks 0.16 v fck

[D] ks 0.10 v fck

Answer : A

283 The moments developed in the slab are influenced by the following factors

i.Short span

ii.Long span

iii.Type of supporting edge.

iv.Magnitude and type of load on slab

[A] i, iii and iv

[B] ii ,iii and iv

[C] i and iii

[D] i, ii , iii and iv

Answer : D

284 Minimum reinforcement in slabs, when High yield strength deformed bars

[A] 0.12% of gross cross sectional area

[B] 0.15% of gross cross sectional area

[C] 0.20% of gross cross sectional area

[D] 0.25% of gross cross sectional area.

Answer : A

285 Permissible width of crack at the surface of concrete for ‘moderate’ environmental conditions according to IS : 456-2000 is

[A] 0.1 mm

[B] 0.2 mm

[C] 0.3 mm

[D] 0.4 mm

Answer : B

286 Limiting moment of resistance of a singly reinforced section for mild steel is

[A] Mu = 0.133 fck bd2

[B] Mu = 0.138 fck bd2

[C] Mu = 0.148 fck bd2

[D] Mu = 0.153 fck bd2

Answer : C

287 In slabs the Maximum horizontal distance between parallel main reinforcement should not exceed

i.Three times effective depth

ii Five times effective depth

iii 300mm

iv 450 mm

[A] i and iii

[B] i and iv

[C] ii and iii

[D] ii and iv

Answer : A

288 Slenderness ratio of the column is the ratio of

[A] the effective length to width of column

[B] the effective length to depth of column

[C] the effective length to least lateral design

[D] none of the above

Answer : C

289 A Column is said to be short, when the slenderness ratio is

[A] Less than 6

[B] Less than 12

[C] Less than 18

[D] None of the above

Answer : B

290 Columns in which lateral loads have to be resisted in addition to vertical loads by the strength of the columns themselves are considered as

[A] Braced columns

[B] Un braced columns

[C] Slender columns

[D] None of the above

Answer : B

291 The unsupported height of column (Lo) is generally

[A] Clear height of the column

[B] Less than the clear height of the column

[C] More than the clear height of the column

[D] None of the above

Answer : A

292 In order to avoid the material failure in a braced column, the clear distance between restraints should never exceed

[A] 30 times the minimum dimensions of the column

[B] 40 times the minimum dimensions of the column

[C] 50 times the minimum dimensions of the column

[D] 60 times the minimum dimensions of the column

Answer : D

293 For Unbraced column, the ratio of the clear height of the column to the minimum dimension of the column shall not exceed

[A] 30

[B] 40

[C] 50

[D] 60

Answer : A

294 The ultimate failure is assumed to be reached when the section reaches a uniform compression strain of

[A] 0.002

[B] 0.0035

[C] 0.0045

[D] 0.005

Answer : A

295 The compression in concrete (fc) at failure is given by

[A] 0.30 fck

[B] 0.45 fck

[C] 0.50 fck

[D] 0.75 fck

Answer : B

296 The compression in steel (fS) at failure for Fe - 415 grade steel using stress-strain curve shall be

[A] 0.87 fy

[B] 0.75 fy

[C] 0.45 fy

[D] 0.55 fy

Answer : B

297 According to IS:456-2000, the minimum eccentricity in no case

[A] Shall be not less than 20mm

[B] Shall be not greater than 30mm

[C] Shall be 20mm-30mm

[D] None of the above

Answer : A

298 The minimum diameter of longitudinal steel should be

[A] 10 mm

[B] 12 mm

[C] 16 mm

[D] 20 mm

Answer : B

299 Minimum number of bars for a column of rectangular section

[A] Two

[B] Four

[C] Six

[D] Eight

Answer : B

300 Minimum number of bars for a circular column

[A] Four

[B] Five

[C] Six

[D] Eight

Answer : C

301 Minimum percentage of longitudinal steel in a column should not be less than

[A] 0.60%

[B] 0.80%

[C] 1.00%

[D] 1.20%

Answer : B

302 Maximum percentage of longitudinal steel in a column should be less than

[A] 6%

[B] 8%

[C] 9%

[D] 10%

Answer : B

303 Minimum cover to longitudinal steel in a column should be (if the diameter of bar, Ø> 12mm)

[A] 25 mm

[B] 30 mm

[C] 40 mm

[D] 50 mm

Answer : C

304 The Maximum spacing of the longitudinal bars measured long the periphery of the column should be

[A] 250 mm

[B] 300 mm

[C] 400 mm

[D] 450 mm

Answer : B

305 In any case, the minimum diameter of the link in a column, according to IS:456-2000 is

[A] 5 mm

[B] 6 mm

[C] 8 mm

[D] 10 mm

Answer : B

306 The diameter of the Links in column should be at least…….of the largest diameter of the longitudinal steel

[A] One-half

[B] Three-fourth

[C] One eighth

[D] One – fourth

Answer : D

307 According to IS: 456 -2000, the spacing of links in a Column should be less than

[A] 16 x diameter of smallest longitudinal bar

[B] 24 x diameter of smallest longitudinal bar

[C] 48 x diameter of smallest longitudinal bar

[D] 48 x diameter of greatest longitudinal bar

Answer : A

308 A column said to be under uniaxial bending, when the eccentricity is

[A] with respect to one axis only

[B] with respect to two axes

[C] zero

[D] 20 mm

Answer : A

309 Select the incorrect statement from the following

In eccentrically loaded columns,

[A] The tensile strength of concrete is ignored

[B] Design stress – strain curve for steel in compression is the same as in tension

[C] The strain at different points in the section will be same

[D] Plane section remain plane even after bending

Answer : C

310 The equilibrium equation for the condition that tension will be equal to the compression is given by

[A] Compression in concrete = Tension in steel

[B] Compression in concrete + Compression in steel = Tension in steel

[C] Compression in concrete = Compression in steel

[D] None of the above

Answer : B

311 The Effective length of a column is defined as the

[A] length between the fixed joints

[B] length between the points of contra flexure

[C] unsupported length of the column

[D] Both (a) and (c)

Answer : B

312 When the ratio of the effective length of the rectangular columns to its lateral dimension exceeds12, then the column is said to be

[A] Short column

[B] Slender column

[C] Biaxial column

[D] All the above

Answer : B

313 According to IS:456, the diameter of the helices in circular a column shall be at least

[A] The diameter of longitudinal steel

[B] One-half the diameter of longitudinal steel

[C] One-fourth the diameter of longitudinal steel

[D] Three-fourth the diameter of longitudinal steel

Answer : C

314 The Maximum strength attained in concrete in limit state design is generally taken as

[A] fck

[B] 0.67 fck

[C] 0.45 fck

[D] 0.30 fck

Answer : C

315 The Pitch of helixes in circular columns shall not exceed

[A] 25 mm

[B] 50 mm

[C] 60 mm

[D] 75 mm

Answer : D

316 The Minimum pitch of the helical reinforcement in circular columns should be

[A] 25 mm

[B] 40 mm

[C] 50 mm

[D] 60 mm

Answer : A

317 Which of the following method that is used to taken into account the slenderness effect of columns according to IS:456 - 2000

[A] Reduction coefficient method

[B] Slenderness method

[C] Moment magnification method

[D] None of the above

Answer : A

318 The Effective length of braced column generally varies……the unsupported length of the column

[A] 0.25 to 0.50 times

[B] 0.50 to 1.00 times

[C] 1.00 to 1.50 times

[D] 2.00 to 2.50 times

Answer : B

319 The purpose of lateral ties in short reinforced concrete columns is to

[A] Facilitate construction

[B] Facilitate compaction of concrete

[C] Increase the load carrying capacity of the columns

[D] Avoid buckling of longitudinal bars

Answer : D

320 The load carrying capacity of helically reinforced column as compared to that of column with ties is about

[A] 5% less

[B] 5% more

[C] 10% less

[D] 10% more`

Answer : B

321 Due to Circumferential action of the spiral reinforcement in a column

[A] Capacity of column is decreased but ductility of column increases

[B] Both the capacity of column an ductility of column increases

[C] Capacity of column increases

[D] Ductility of the column reduces

Answer : B

322 According to IS:456-2000, the minimum slenderness ratio for a short column is

[A] Less than 12

[B] Between 12 and 18

[C] Less than 18

[D] Must be greater than 18

Answer : A

323 Select the incorrect statement from the following

[A] Reinforcing bars in a column should not be less than 12 mm in diameter

[B] The number of longitudinal bars in a circular column should not exceed four

[C] The minimum percentage of longitudinal steel in columns should be 0.8%

[D] None of the above

Answer : B

TEST-1

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. The strength of durability of concrete depends upon.
   (a) Size of aggregates
   (b) Grading of aggregates
   (c) Moisture contents of aggregates
   (d) All of these.
2. The workability of concrete is defined as the
   (a) Ease with which it can be mixed, transported and placed in position in a homogeneous state.
   (b) Bearing up of cohesion in a mass concrete.
   (c) Separation of water from the freshly mixed concrete.
   (d) None of these.
3. The maximum percentage of chemical ingredient of cement is
   (a) Alumina
   (b) Iron oxide
   (c) Lime
   (d) Silica
4. Which compound in cement, gives early age strength
   (a) C_3S
   (b) C_2S
   (c) C_3A
   (d) C_4AF
5. For cold weathering concreting the cement used is
   (a) O.P.C
   (b) R.H.C
   (c) L.H.C
   (d) None of these
6. The length of the vicat plunger is
   (a) 40mm
   (b) 60mm
   (c) 50mm
   (d) 30mm
7. The unit weight of cement in kN/m^3
   (a) 25 kN/m^3
   (b) 24 kN/m^3

(c) 20 kN/m^3
(d) 16 kN/m^3

8. Sand that is recommended for R.C.C work should have fineness modulus.
   (a) 0-2
   (b) 2-3.5
   (c) 3-4.5
   (d) 4-5
9. For dam construction the size of aggregates are
   (a) 40mm
   (b) 50mm
   (c) 60mm
   (d) 75mm
10. The bulk density of aggregates , is
   (a) kN/m^3
   (b) Kg/1tr
   (c) g/cm^3
   (d) All the above.
11. The PH value of water shall not less than.
   (a) 5.0
   (b) 6.0
   (c) 6.5
   (d) 7.0
12. Water cement ratio is
   (a) Weight of water to that of cement.
   (b) Weight of concrete to that of water.
   (c) Volume of concrete to that of water.
   (d) All the above.
13. The minimum water-cement ratio is
   (a) 0.35
   (b) 0.45
   (c) 0.50
   (d) None of these
14. The modules of elasticity of steel shall be taken as
   (a) 100kN/mm^2
   (b) 200 kN/mm^2
   (c) 250 kN/mm^2
   (d) 300 kN/mm^2
15. Tensile strength of concrete from the compressive strength, is found to be
   (a) $F_{cr}=0.7\sqrt{f_{ck}}$ N/mm^2
   (b) $F_{cr}=0.8\sqrt{f_{ck}}$ N/mm^2

(c) $F_{cr}=0.6\sqrt{f_{ck}}$ N/mm^2
(d) All the above

16. Segregation in concrete results in
    (a) Honey combing
    (b) Porous Layers
    (c) Surface scaling
    (d) All the above
17. Harshness in concrete is due to the excess of
    (a) Water
    (b) Finer particles
    (c) Middle sized particles
    (d) Coarse particles
18. In order to avoid segregation, the concrete should not be thrown from a height
    (a) Agree
    (b) Disagree
    (c) Not known
    (d) None of these
19. Reinforced cement concrete is equally strong in taking
    (a) Tensile and compressive stress
    (b) Compressive and shear stresses.
    (c) Tensile, compressive and shear stresses.
    (d) Tensile and shear stresses.
20. Plain cement concrete is strong in taking
    (a) Compressive stress.
    (b) Tensile stress
    (c) Shear stress
    (d) All of these
21. Unit weight of P.C.C . in kN/m^3 is
    (a) 24 KN/m^3
    (b) 25 kN/m^3
    (c) 20kN/m^3
    (d) 26 kN/m^3
22. For one bag of cement water required is
    (a) 10 kg
    (b) 30 kg
    (c) 35 kg
    (d) 39 kg
23. The removal of excess air after placing concrete helps in increasing the strength of concrete by
    (a) 15 to 20%
    (b) 20 to 30%
    (c) 30 to 50%

(d) 50 to 70%

24. Cement concrete is _____to moisture
    (a) Permeable
    (b) Impermeable
    (c) Rapid Harden
    (d) None of these
25. The concrete without any reinforcement has _____tensile strength
    (a) High
    (b) Medium
    (c) Low
    (d) All the above
26. Segregation of concrete
    (a) Increases the strength of concrete
    (b) Decreased the strength of concrete.
    (c) Not effect to strength of concrete.
    (d) None of these.
27. The material used as an ingredient of concrete is usually
    (a) Cement
    (b) Aggregate
    (c) Water
    (d) All the above
28. A suitable admixture added at the time of preparing the concrete mix, makes the concrete
    (a) Water proof
    (b) Acid proof
    (c) Highly strong
    (d) All of the above
29. The function of aggregates in concrete is to serve as
    (a) Binding material
    (b) Filler
    (c) Catalyst
    (d) All the above
30. Calcareous and argillaceous materials used in manufacture of cement consists of
    (a) Lime stone
    (b) Chalk
    (c) Shales
    (d) All the above
31. In the manufacture of cement, the dry of wet mixtue of calcareous and argillaceous materials is burnt in a
    (a) A Rotary kiln
    (b) A Grinder
    (c) Country kiln
    (d) All the above

32. The proportion of lime, silica, alumina and iron oxide in a Portland cement is
    (a) 63:22:6:3
    (b) 63:22:3:6
    (c) 22:63:6:3
    (d) All the above
33. The presence of lime in cement
    (a) Make s the cement sound and provides strength to the cement.
    (b) Prolong the setting time
    (c) Causes unsoundness in cement
    (d) All the above
34. The gypsum is added to the cement for
    (a) Providing high strength to the cement
    (b) Controlling the initial setting time of cement.
    (c) Lowering the clinkering temp of cement
    (d) All the above.
35. Which of the following ingredient of cement when added in excess quantity, causes the cement to set slowly.
    (a) Lime
    (b) Silica
    (c) Alumina
    (d) Iron oxide
36. Excess lime when added
    (a) Makes the cement unsound
    (b) Causes the cement to expand and disintegrate
    (c) Lowering the clinkering temp of cement
    (d) Both ‘a’ and ‘b’
37. In order to provide colour, hardness and strength to the cement, the ingredient used is
    (a) Lime
    (b) Solica
    (c) Alumina
    (d) Iron oxide
38. After the final grinding, the cement is sieved through IS sieve number
    (a) 9
    (b) 12
    (c) 24
    (d) 48
39. Efflorescence is cement is caused due to the excess of
    (a) Lime
    (b) Silica
    (c) Alkalies
    (d) Iron oxide
40. The presence of tricalcium silicate in cement

(a) Hydrates the cement rapidly
(b) Generates less heat of hydration.
(c) Offer high resistance to sulphate attack
(d) All of these

ANSWER:

1(d),2(a),3(c),4(a),5(b),6(c),7(d),8(b),9(a),10(b),11(b),12(a),13(a),14(b),15(a),16(d),17(c),18(a),19(c),20(a),21(a),22(c),23(a),24(b),25(c),26(b),27(d),28(d),29(b),30(d),31(a),32(a),33(a),34(b),35(b),36(d),37(d),38(a),39(c),40(a)

TEST-2

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. The presence of dicalcium silicate in cement.
   (a) Hydrates the cement slowly.
   (b) Generates less heat of hydration.
   (c) Has more resistance to sulphate attack.
   (d) All of these
2. High percentage of tricalcium silicate and low percentage of dicalcium silicate in cement results in.
   (a) Rapid hardening
   (b) High early strength
   (c) High heat of generation
   (d) All the above
3. The first compound which reacts with water when mixed with cement is
   (a) Tricalcium Aluminate
   (b) Tricalcium silicate
   (c) Di-calcium silicate
   (d) Teracalcium aluminate
4. The sum of the percentage of tricalcium silicate and dicalcium silicate for Portland cement varies from.
   (a) 50 to 60%
   (b) 60 to 70%
   (c) 70 to 80%
   (d) 80 to 90%

5. The rate of hydration is _____proportional to the generation of heat
   (a) Directly
   (b) Indirectly
   (c) Equally
   (d) None of these
6. Rapid hardening cement is used
   (a) Where high early strength is desired
   (b) Where form work is to be removed as early as possible
   (c) For construction of road pavements.
   (d) All of the above
7. Low heat cement is used in
   (a) Thin structures
   (b) Thick structures
   (c) Sea structures
   (d) Submarine structures
8. Blast furnace slag cement concrete requires _____time for shuttering and curing.
   (a) Less
   (b) More
   (c) Medium
   (d) All the above
9. Which of the following cements is expected to have the highest compressive strength after 3 days
   (a) Ordinary Portland cement
   (b) Rapid hardening cement
   (c) High alumina cement
   (d) Sulphate resisting cement.
10. Under sea structure, the cement used is
   (a) R.H.C
   (b) L.H.C
   (c) H.A.C
   (d) RSC
11. The cement, widely used in retaining walls, is
   (a) R.H.C
   (b) L.H.C
   (c) S.R.C.
   (d) O.P.C.
12. The strength of concrete using air entraining cement gets reduced by
   (a) 5 to 10%
   (b) 10 to 15%
   (c) 15 to 20%
   (d) 20 to 25%
13. Pozzolana is essentially a silicious material containing clay up to

(a) 20%
(b) 40%
(c) 60%
(d) 80%

14. Which of the following statements is correct?
    (a) Sulphate resisting cement is particularly used for canal lining.
    (b) Low heat cement should not be used for thin concrete structures.
    (c) Rapid hardening cement should not be used for massive concrete structures
    (d) All of the above
15. Match the correct answer

Group A	Group B
`1. Bhakra dam	(A) High alumina cement
2. Chemical plants	(B) Pozzolana cement
3.Not to be used in thin R.C.C. structures.	(C)Sulphate resisting cement
4. Marina works	(D) Blast furnace slag cement

16. The degree of grinding of cement is called
    (a) Fineness
    (b) Soundness
    (c)Impact value
    (d) Bulking
17. Too much fineness of cement
    (a) Results cracks in concrete
    (b) Generates greater heat
    (c) Develops later strength
    (d) All the above
18. According to IS Code , the requirement of an ordinary Portland cement is
    (a) The residue does not exceed 10% when sieved through is sieve no .9
    (b) Its initial setting time is not less than 30 minutes.
    (c) its expansion is not morethan 10mm for unaerated cement
    (d) All the above.
19. The compressive strength an ordinary Portland cement (1:3) after 7 days test should not be less than.
    (a) 11N/mm^2
    (b) 17.5 N/mm^2
    (c) 22 N/mm^2
    (d) 27.5N/m^2
20. The percentage of water for making a cement paste of normal consistency varies from
    (a) 15 to 25%
    (b) 25 to 35%
    (c) 35 to 50%
    (d) 50 to 60%
21. For performing the compressive strength test of cement, the size of cube mould should be
    (a) 7.06cm
    (b)75mm
    (c)80mm

(d)All the above

22.The cubes of cement prepared for compressive strength test should be kept at a temp of _____in an atmosphere of at least 90% humidity of r 24hours

(a) $15^0 \pm 2^0C$
(b) $21^0 \pm 2^0C$
(c) $27^0 \pm 2^0C$
(d) $30^0 \pm 2^0C$

23. The inert mineral material used for the manufacture of mortars and concrete is

(a) Cement
(b) Water
(c) Aggregates
(d) Admixture

24. Accordingly to IS: 383-1970, a good aggregate for concrete construction should be

(a) Chemically inert
(b) Sufficiently strong
(c)Sufficiently hard and durable
(d) All the above

25. For reinforced concrete, the aggregate used is

(a) Sand
(b) Gravel
(c) Crushed rock
(d) All of these

26. For the manufacture of concrete a low density, the aggregate used is

(a) Furnace clinker
(b) Coke breeze
(c)Saw dust
(d) All the above

27. The aggregate which pass through 75mm IS sieve and entirely retain on 4.75 IS sieve is known as

(a) Cyclopean aggregate
(b) Coarse aggregate
(c)Fine aggregate
(d) Aall-in-aggregate

28. The minimum particle size of fine aggregate is

(a) 0.0075mm
(b) 0.075mm
(c)0.75mm
(d)0.95m

29. . The aggregates of _____-shape have manimum voids

(a) Irregular
(b) Angular
(c)Rounded
(d) Flaky

30. The aggregates of _____-shape have maximum voids

(a) Irregular
(b) Angular
(c)Rounded
(d) Flaky

31.Which of the following statement is correct

(a) The maximum size of coarse aggregate should not exceed one fourth of the minimum dimension of the plain concrete member.

(b) The maximum size of coarse aggregate should not exceed one fifty of the minimum dimension of the reinforced concrete member

(c)The aggregates of 40mm, 20mm and 10mm sizes are commonly used for concrete works

(d) All the above

32. An aggregate which may contain some moisture in the pores but having dry surface is known as.
    (a) Dry aggregate
    (b) Moist aggregate
    (c) Saturated surface dry aggregate
    (d) All the above
33. An aggregate having all the pores filled with water but having dry surface is called .
    (a) Dry aggregate
    (b) Moist aggregate
    (c) Saturated surface dry aggregate
    (d) All the above
34. An aggregate having all the pores are filled with water and also having its surface wet is called
    (a) Dry aggregate
    (b) Moist aggregate
    (c) Saturated surface dry aggregate
    (d) All the above
35. The deleterious materials present in the aggregate
    (a) Prevent normal hydration of cement
    (b) Reduce the strength and durability of concrete.
    (c) Modify the setting action and cause efloresecence.
    (d) All of the above
36. The resistance of an aggregates to compressive forces is known as
    (a) Crushing value
    (b) Impact value
    (c)Abrasion value
    (d) None of these
37. The resistance of an aggregates to wear is known as
    (a) Shear value
    (b) Crushing value
    (c)Abrasion value
    (d) Impact value
38. Los Angles machine is used to perform
    (a) Crushing strength
    (b) Impact test
    (c) Water absorption
    (d) Abrasion resistance test
39. The value fineness modules for fin sand is
    (a) 1.1 to 1.3
    (b) 1.3 to 1.6
    (c)1.6 to 2.2
    (d) 2.2 to 2.6
40. If th fineness modules of sand is 3, then the sand is graded as
    (a) Very fine sand

(b) Fine sand
(c)Medium sand
(d) Coarse sand

ANSWER:

1(d),2(d),3(a),4(c),5(a),6(d),7(b),8(b),9(c),10(c),11(b),12(b),13(d),14(d),15(1.b)(2.a)(3.d)(4.c),16(a),17(d),18(d),19(b),20(b),21(a),22(c),23(c),24(d),25(d),26(d),27(b),28(b),29(c),30(b),31(d),32(a),33(c),34(b),35(d),36(a),37(c),38(d),39(d),40(d)

TEST-3

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. The standard sand now used in India is obtained from
   (a) Ennore (Chennai)
   (b) Mumbai
   (c) Orissa
   (d) Jajpur
2. Insufficient quantity of water
   (a) Makes the concrete mix harsh
   (b) Makes the concrete mix unworkable
   (c) Causes segregation in concrete
   (d) Causes bleeding in concrete.
3. Excess quantity of water
   (a) Makes the concrete mix harsh
   (b) Makes the concrete mix unworkable
   (c) Causes segregation in concrete
   (d) Causes bleeding in concrete.
4. According to the rule of water cement ratio, the strength of concrete wholly depends upon.
   (a) The quality of cement.

(b) The quality of cement mixed with aggregate.
(c) The amount of water used in preparation of concrete mix.
(d) All of the above

5. The strength of cement concrete increases with
   (a) The increase of water cement ratio.
   (b) The decrease of water cement ratio.
   (c) The increase of cement ratio
   (d) None of these
6. In case of honey –comb structure, the water-cement ratio is
   (a) More than 0.35
   (b) Less than 0.35
   (c) More than 0.45
   (d) Less than 0.45
7. Hydration of cement is due to the chemical action of water with.
   (a) Tricalcium silicate
   (b) Dicalcium silicate
   (c) Tricalcium aluminate
   (d) All of these
8. The development of first 28 days strength is on account of the hydration of
   (a) Tricalcium silicate
   (b) Dicalcium silicate
   (c) Tricalcium aluminate
   (d) Tetra calcium alumina ferrite
9. Water cement ration is, usually, expressed in
   (a) Litres of water required per bag of cement
   (b) Litres of water required per kg of cement
   (c) Both (a) and (b)
   (d) None of these
10. High temp_____the setting time of cement in concrete
    (a) Increases
    (b) Decreases
    (c) No effect
    (d) None of these
11. The concrete mix is said to be workable if it has
    (a) Compatibility
    (b) Movability
    (c) Stability
    (d) All of these
12. The internal friction between the ingredients to concrete is minimized by
    (a) Adopting coarse aggregates
    (b) Using more water
    (c) Reducing the surface area

(d) All of these

13. For the improvement of work ability of concrete , the shape of aggregate recommended is
    (a) Irregular
    (b) Angular
    (c) Round
    (d) Flaky
14. The use of air-entraining agents in concretes
    (a) Increases workability of concrete
    (b) Decreases bleeding
    (c) Decreases strength
    (d) All of these
15. The workability of concrete is expressed by
    (a) Water-cement ratio
    (b) Slump value
    (c) Compaction factor
    (d) Both (a) and (b)
16. The workability of concrete can be improved by adding
    (a) Hydrated lime
    (b) Fly ash
    (c) Calcium chloride
    (d) All the above
17. The steel mould used for slump test is in the form of a
    (a) Cube
    (b) Cylinder
    (c) Frustrum of a cone
    (d) None of these
18. The top diameter, bottom diameter and height of the mould used for slump test are
    (a) 100mm, 200mm, 300mm
    (b) 200mm,100mm,300mm
    (c) 200mm,300mm,100mm
    (d) 100mm,300mm,200mm
19. For high degree of workability, the slump value should vary between
    (a) 0 to 25mm
    (b) 25 to 50mm
    (c) 50 to 80mm
    (d) 80 to 100mm
20. For high degree of workability , the compaction factor is
    (a) 0.65
    (b) 0.75
    (c) 0.85
    (d) 0.95
21. Vibrated concrete needs _____slump values

(a) High
(b) Less
(c) Nil
(d) None of these

22. The slump test of concrete is used to measure its
    (a) Consistency
    (b) Mobility
    (c) Homogeneity
    (d) All the above
23. The Vee-Bee test is suitable for concrete mixes of low and very low workabilities
    (a) True
    (b) False
    (c) Not known
    (d) All the above
24. As per IS:456-1978, the concrete mixes are designated into
    (a) 4 grades
    (b) 5 grades
    (c) 6 grades
    (d) 7 grades
25. Which of the following grade is not recommended by IS 456-1978?
    (a) M_{10}
    (b) M_{20}
    (c) M_{40}
    (d) M_{55}
26. In order to prepare a test specimen, it is necessary to
    (a) Mix the cement and fine aggregate (sand) dry hand
    (b) Mix the coarse aggregate
    (c) Mix water to the cement, fine aggregate and coarse aggregate
    (d) All of the above
27. The ratio of differenct ingredients (cement, sand and aggregate) in concrete mix of grade M_{20} is.
    (a) 1:1:2
    (b) 1:1.5:2
    (c) 1:2:4
    (d) 1:3:6
28. For mass concrete in piers and abutments, the grade of concrete mix used, is
    (a) 1:1:2
    (b) 1:1.5:2
    (c) 1:2:4
    (d) 1:3:6
29. For highly loaded columns, the concrete mix used is
    (a) 1:1:2
    (b) 1:1.5:2

(c) 1:2:4
(d) 1:3:6

30. The correct proportioning of various ingredients of concrete largely
    (a) Bulking of sand
    (b) Water context
    (c) Absorption
    (d) All the above
31. The maximum quantity of aggregate per 50kg of cement should not axceed.
    (a) 100kg
    (b) 200kg
    (c) 350kg
    (d) 450kg
32. The minimum quantity of cement to be used in controlled concrete is
    (a) 120kg/cm^2
    (b) 160 kg/cm^2
    (c) 220 kg/cm^2
    (d) 280 kg/cm^2
33. The concrete in which no preliminary tests are performed for designing the mix is called
    (a) Rich concrete
    (b) Controlled concrete
    (c) Lean concrete
    (d) Ordinary concrete
34. The factors which effects the design of concrete mix is
    (a) Fineness modulus
    (b) Water cement ratio
    (c) Slump
    (d) All of these
35. The process of mixing, transporting, placing and compacting the cement, concrete should not take more than.
    (a) 30 minutes
    (b) 60minutes
    (c) 90 minutes
    (d) 120mm
36. To prevent segregation the concrete should to be thrown from a height of more than.
    (a) ½ m
    (b) 1m
    (c) 1.5m
    (d) 2m
37. The process of consolidating concrete mix after placing it in position is termed as.
    (a) Curing
    (b) Wetting
    (c) Compaction

(d) All of these

38. The object of curing is to
    (a) Prevent the loss of water by evaporation.
    (b) Reduce the shrinkage of concrete
    (c) Preserve the properties of concrete
    (d) All of these
39. If 30% excess water is added, the strength of concrete is reduced by
    (a) 30%
    (b) 40%
    (c) 50%
    (d) 60%
40. After moulding, the test specimens of trial mix are placed at a temp. of
    (a) 10 ± 2^0C
    (b) 15 ± 2^0C
    (c) 23 ± 2^0C
    (d) 27 ± 2^0C

ANSWER:

1(a),2(botha&b),3(bothc&d),4(c),5(a),6(b),7(d),8(a),9(a),10(b),11(d),12(d),13(c),14(d),15(d),16(d),17(c),18(a),19(d),20(d),21(b),22(a),23(a),24(d),25(d),26(d),27(b),28(d),29(a),30(d),31(d),32(c),33(d),34(d),35(a),36(b),37(c),38(d),39(c),40(d)

TEST-4

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. In the reinforced cement concrete structure, the steel reinforcement consists of .
   (a) Deformed bars
   (b) Cold twisted bars
   (c) Mildsteel and medium tensile steel bars
   (d) All of these
2. In singly reinforced beams, steel reinforcement is provided in
   (a) Compressive zone
   (b) Tensile zone
   (c) Neutral zone

(d) All the above

3. In a simply supported reinforced concrete beam, the reinforcement is placed.
   (a) Above the neutral axis
   (b) Below the neutral axis
   (c) At the neutral axis
   (d) None of these
4. In a singly reinforced beam, the effective depth is measured form the compression edge to the
   (a) Tensile edge
   (b) Centre of tensile reinforcement
   (c) Neutral axis of the beam
   (d) All of the above
5. The application of elastic theory to the beams is based on the assumption that
   (a) At any cross-section, plane sections before bending remain plane after bending
   (b) All tensile stresses are taken up by reinforcement alone and none by the concrete.
   (c) Steel reinforcement is free from initial stresses when it is embedded in concrete.
   (d) All of the above
6. In case of a cantilever beam , the tensile zone is D.
   (a) Above the neutral axis
   (b) Below the neutralaxis
   (c) At the neutral axis
   (d) All the above
7. If σ_{cbc} is the permissible stress in compression due to bending in concrete in N/mm^2 , the modular ration(m) is of the order of
   (a) $\frac{280}{\sigma_{cbc}}$
   (b) $\frac{280}{3\sigma_{cbc}}$
   (c) $\frac{280}{4\sigma_{cbc}}$
   (d) None of these
8. In a singly reinforced concrete beam, if the load is vey small.
   (a) Only concrete will resist tension
   (b) Only steel bars will resist tension.
   (c) Both concrete & steel will resist tension.
   (d) Both concrete & steel will resist compression.
9. The modular ratio is the ration of
   (a) Young's modulus of steel to the young's modulus of concrete
   (b) Young's modules of concrete to the young's modulus of steel
   (c) Load carried by steel to the load carried by concrete.
   (d) Load carried by concrete to the load carried by step.

10. In a reinforced concrete column, the cross –sectional area of steel bar is as and that of concrete ia AC; the equivalent area of the section n terms of concrete is equal to.
    (a) As+mA_c
    (b) A_c+mA_s
    (c) A_s-mA_c
    (d) A_c-mA_s
11. In a singly reinforced concrete beam, as the load increases.
    (a) Only concrete will resist tension
    (b) Only steel bars will resist tension.
    (c) Both concrete and steel will resist tension.
    (d) Both concrete and steel will resist compression.
12. Normally, the tensile strength of concrete is about_____of its compressive strength
    (a) 10 to 15%
    (b) 15 to 20%
    (c) 20 to 25%
    (d) 25 to 30%
13. If the load on beam is increased, the tensile stress sin the concrete below the neutral axis will
    (a) Increase
    (b) Decrease
    (c) Remain unchanged
    (d) None of these
14. Under normal loading conditions, the tensile stressed setup in the concrete will be _____the permissible stress.
    (a) More than
    (b) Less than
    (c) Equal to
    (d) All the above
15. A reinforced concrete beam will crack if tensile stress set up in the concrete below the neutral axis is
    (a) More than the permissible stress
    (b) Less than the permissible stress
    (c) Equal to the permissible stress
    (d) All the above.
16. In a sibgly reinforced beam the depth of neutral axis below the top of the beam (n_c) is
    (a) $N_c=\frac{m\sigma_{cbc}}{m\sigma_{cbc}+\sigma_{st}} \times d$
    (b) $N_c=\frac{m\sigma_{cbc}}{m\sigma_{cbc}-\sigma_{st}} \times d$
    (c) $N_c=\frac{m\sigma_{cbc}+\sigma_{st}}{m\sigma_{cbc}} \times d$

(d) $N_c = \frac{m\sigma_{cbc} - \sigma_{st}}{m\sigma_{cbc}} \times d$

17. If the breadth of a singly reinforced beam is d, effective depth is d, depth of neutral ax is below the top of beam is n and the compressive stress in the extreme fibre of concrete is σ_{cbc} , the the moment of resistance of the beak is equal to .
    (a) $M.R = b_n \frac{\sigma_{cbc}}{2}\left(\frac{3d-n}{3}\right)$
    (b) $M.R = b_n \frac{\sigma_{cbc}}{2}\left(\frac{d-n}{3}\right)$
    (c) $M.R = b_n \frac{\sigma_{cbc}}{2}\left(\frac{2d-n}{3}\right)$
    (d) $M.R = b_n \frac{\sigma_{cbc}}{2}\left(\frac{2d-n}{4}\right)$
18. The leave arm in a singly reinforced beam is
    (a) $\frac{d-n}{3}$
    (b) $\frac{2d-n}{3}$
    (c) $\frac{3d-n}{3}$
    (d) $\frac{4d-n}{3}$
19. In a beam section, if the steel reinforcement is of such a magnitude that the permissible stresses in concrete and steel are developed simultaneously, the section is.
    (a) Balanced section
    (b) Economical section
    (c) Critical section
    (d) All the above
20. The section in which concrete is not fully stressed to its permissible value when stress in steel reaches its maximum value is
    (a) Under-reinforced section
    (b) Over-reinforced section
    (c) Critical section
    (d) Balanced section
21. The actual neutral axis of n under reinforced section is above the critical neutral axis of a balanced section
    (a) Correct
    (b) Incorrect
    (c) Not known
    (d) None of these
22. The neutral axis of a balanced section is called
    (a) Balanced neutral axis
    (b) Critical neutral axis

(c) Equivalent neutral axis
(d) All of these

23. The moment of resistance of an under- reinforced section is computer on the basis of
    (a) Compressive force developed in concrete
    (b) Tensile force developed in steel
    (c) Both (a) & (b)
    (d) All the above
24. In a singly reinforced beam, if the stress in concrete reaches its allowable limit later than the steel reaches, its permissible value, the beam section is said to be
    (a) Under-reinforced section
    (b) Over-reinforced section
    (c) Critical section
    (d) Balanced section
25. If the tensile stress in steel reinforcement is σ_{st} depth of neutral axis is n and the effective depth d, then the moment of resistance of an under-reinforced section is
    (a) $\sigma_{st} A_{st} \left[\frac{d-n}{3}\right]$
    (b) $\sigma_{st} A_{st} \left[\frac{2d-n}{3}\right]$
    (c) $\sigma_{st} A_{st} \left[\frac{3d-n}{3}\right]$
    (d) $\sigma_{st} A_{st} \left[\frac{4d-n}{3}\right]$
26. In an over-reinforced section
    (a) Steel reinforcement is not fully stressed to its permissible value
    (b) Concrete is not fully stressed to its permissible value
    (c) Either (a) and (b)
    (d) Both (a) and (b)
27. For an over –reinforced (singly reinforced)rectangular reinforced concrete section
    (a) The lever arm will be less than that for a balanced section
    (b) The maximum stress developed by concrete will be equal to allowable stress in concrete
    (c) The maximum stress developed by steel will be equal to the allowable
    (d) All the above
28. The moment of resistance of an over-reinforcement section is determined on the basis of
    (a) Compressive force developed in concrete
    (b) Tensile force developed in steel
    (c) Both (a) & (b)
    (d) None of these
29. The neutral axis of an over –reinforced section falls
    (a) On the critical neutral axis of balanced section.

(b) Below the critical neutral axis of balanced section
(c) Above the neutral axis o balanced section
(d) Al l the above

30. For a balanced section, the moment of resistance obtained from compressive force will be _____the moment of resistance obtained from the tensile force
    (a) Greater than
    (b) Less than
    (c) Equal to
    (d) None of these
31. As the percentage of steel in a beam increases, the depth of neutral axis
    (a) Increases
    (b) Decreases
    (c) Equal to
    (d) None of these
32. For a balanced reinforced section, the depth of critical neutral axis from the top of the beam (n_c) is given by
    (a) $\frac{m\sigma_{cbc}}{\sigma_{st}} = \frac{n_c}{d - n_c}$
    (b) $\frac{m\sigma_{cbc}}{\sigma_{st}} = \frac{d - n_c}{n_c}$
    (c) $\frac{m\sigma_{cbc}}{\sigma_{st}} = \frac{n_c}{d + n_c}$
    (d) $\frac{m\sigma_{cbc}}{\sigma_{st}} = \frac{d + n_c}{n_c}$
33. The effective depth of a singly reinforced rectangular beam is 300mm. the section is over-reinforced and the neutral axis is 120mm below the top. If the maximum stress attained by concrete is 5N/mn^2 and the modular ratio is 18, then the stress developed in the steel will
    (a) 130N/mm^2
    (b) 135N/mm^2
    (c) 160N/mm^2
    (d) 180N/mm^2
34. The maximum shear stress (τ_{max}) in a reinforced concrete beam of width (b) and subjected to as hear force (F) is equal to
    (a) $\frac{F}{b(3d - n)}$
    (b) $\frac{2F}{b(3d - n)}$
    (c) $\frac{3F}{b(3d - n)}$
    (d) $\frac{4F}{b(3d - n)}$
35. Regarding the working stress design of under reinforced concrete section,

(a) The neutral axis depth will be greater than that of a balanced section.
(b) The stress in steel intension will reach its maximum permissible value first.
(c) The moment of resistance will be less than that of the balanced section.
(d) The concrete on the tension side is also be considered for calculating the moment of resistance of the section.

36. If modular ratio is m, effective depth is d and stress ratio is r=$\frac{\sigma_{st}}{\sigma_{cbc}}$
Then the depth of neutral axis (n_c) of a balanced section is
(a) $\frac{m}{(m-r)} \times d$
(b) $\frac{m}{(m+r)} \times d$
(c) $\frac{(m+r)}{m} \times d$
(d) $\frac{m}{r} \times d$

37. The deep beams are designed for
(a) Shear force only
(b) Bending moment only
(c) Both S.F & B.M
(d) Bearing

38. In a reinforced concrete beam , the shear stress distribution above the neutral axis following a
(a) A straight line
(b) Circular curve
(c) Parabolic curve
(d) All the above

39. The maximum shear stress in rectangular beam is _____times of average shear stress.
(a) 1.15
(b) 1.25
(c) 1.50
(d) 1.75

40. For a reinforced concrete beam section, the shape of shear stress diagram is
(a) Parabolic over the whole section with maximum value at the neutral axis.
(b) Parabolic above the neutral axis and rectangular below the neutral axis.
(c) Linearly varying as the distance form the N.A.
(d) All the above.

ANSWER:

1(d),2(b),3(b),4(b),5(d),6(a),7(b),8(c),9(c),10(b),11(b),12(a),13(a),14(a),15(a),16(a),17(a),18(c),19(d),20(a),21(a),22(b),23(b),24(b),25(c),26(a),27(b),28(a),29(b),30(c),31(a),32(a),33(b),34(c),35(bothb&c),36(b),37(b),38(c),39(c),40(b)

TEST-5

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. Shear reinforcement is provided in the form of
   (a) Vertical bars
   (b) Inclined bars
   (c) Combination of vertical and inclined bars
   (d) All the above
2. At the centre of beam, the shearing stresses are
   (a) More
   (b) Less
   (c) Negligible
   (d) None of these
3. The centre to centre spacing of vertical stirrups, in a rectangular beam, is
   (a) Increased towards the centre of the span of the beam
   (b) Decreased towards the centre of the span of the beam.
   (c) Increased at the ends.
   (d) None of these
4. The number of stirrups resisting shear force, in a reinforced beam, is given by
   (a) $\frac{shear\ force}{spacing\ of\ stirrups}$
   (b) $\frac{lever\ arm}{spacing\ of\ stirrups}$
   (c) $\frac{spacing\ of\ stirrups}{leaver\ arm}$

(d) $\frac{spacing\ of\ stirrups}{shfar\ force}$

5. A stirrups consists of _____diameter mildsteel bars bent round the tensile reinforcement
   (a) 1 to 5mm
   (b) 5 to 12mm
   (c) 12 to 18mm
   (d) All the above
6. According to IS:456-1978, the spacing of stirrups shall not exceed a distance _____the leverarm of the resisting moment.
   (a) Equal to
   (b) Two times
   (c) Three times
   (d) All the above
7. The torsion resisting capacity of a given reinforced concrete section.
   (a) Decreases with decrease in stirrups spacing.
   (b) Decreases with increase in longitudinal bars.
   (c) Does not depend upon stirrups and longitudinal steels.
   (d) Increases with increase in stirrups and longitudinal steels.
8. When the steel bars are embedded in concrete. The concrete after setting, adheres to the surface of the bars and thus resist any force that tends to pull or push this road. The intensity of this adhesive force is called.
   (a) Bond stress
   (b) Shear stress
   (c) Compressive stress
   (d) All of these
9. The longitudinal shearing stresses acting on the surface between the steel and concrete are called.
   (a) Bond stress
   (b) Tensile stresses
   (c) Compressive stresses
   (d) None of these
10. If L is the lever arm in reinforced concrete beam, S is the total perimeter of the steel bars and F is the shear force, then bond stress developed in concrete around the steel reinforcement is
    (a) $\frac{F.S}{L}$
    (b) $\frac{F.L}{S}$
    (c) $\frac{F}{S.L}$
    (d) $F.S.L$
11. As per IS :456-1978, the permissible value of bond – stress for M_{15} grade of concrete is
    (a) 0.5 N/mm^2

(b) 1 N/mm^2
(c) 1.5 N/mm^2
(d) 2 N/mm^2

12. If the bond stress developed in a reinforced concrete beam is more than permissible value, it can be brought down by.
    (a) Increasing the depth of beam
    (b) Increasing the number of bars.
    (c) Decreasing the diameter of the bars
    (d) All of these
13. If $\emptyset$ is the diameter of reinforcing bar, then for M_{15} grade concrete and mild steel, the bond length used for spicing bar in tension is equal to
    (a) 28 $\emptyset$
    (b) 38$\emptyset$
    (c) 58$\emptyset$
    (d) 68$\emptyset$
14. When the diameter of a reinforcement bar is $\emptyset$, the anchorage value of the hook alone is equal to
    (a) 2 $\emptyset$
    (b) 8 $\emptyset$
    (c) 16 $\emptyset$
    (d) 32 $\emptyset$
15. If $\emptyset$ is the bar diameter, σ_s is the actual tensile stress in bar and τ_{bd} is the permissible average bond stress the length of lap for reinforcement bars in tension shall not be less than.
    (a) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
    (b) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
    (c) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
    (d) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
16. If $\emptyset$ is the bar diameter, σ_s, is the actual compressive stress in bar and τ_{bd} is the permissible average bond stresses the length for reinforcement bars in compression shall not be less than.
    (a) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
    (b) $\frac{\emptyset\sigma_s}{4\tau_{bd}}$ or 24 $\emptyset$ which ever is smaller
    (c) $\frac{\emptyset\sigma_s}{2\tau_{bd}}$ or 30 $\emptyset$ which ever is smaller
    (d) $\frac{\emptyset\sigma_s}{5\tau_{bd}}$ or 30 $\emptyset$ which ever is smaller
17. In a doubly reinforced beam , steel reinforcement is provided in a

(a) Tensile zone
(b) Compression zone
(c) Either (a) & (b)
(d) Both (a) & (b)

18. A doubly reinforced section is used
    (a) When the members are subjected to alternate external loads and the bending moment in the sections reverses.
    (b) When the member are subjected to loading eccentric in either side of the axis.
    (c) When the members are subjected to accidental lateral loads .
    (d) All of the above
19. In doubly reinforced rectangular beam, the allowatte stress in compression steel is_____the permissible stross intension insteel.
    (a) Greater than
    (b) Less than
    (c) Equal to
    (d) All of these
20. If the effective depth of a doubly reinforced concrete is d, the maximum stress in steel & concrete are σ_{st} and σ_{cbc}, then the neutral axis depth factor (k) if given by
    (a) K= $\frac{m\sigma_{cbc} + \sigma_{st}}{m\sigma_{cbc}}$
    (b) K= $\frac{m\sigma_{cbc}}{m\sigma_{cbc+\sigma_{st}}}$
    (c) K= $\frac{m\sigma_{cbc} - \sigma_{st}}{m\sigma_{cbc}}$
    (d) K= $\frac{m\sigma_{cbc}}{m\sigma_{cbc} - \sigma_{st}}$
21. The section of the beam having greater width at the top in comparison to the width below neutral axis is known as.
    (a) Critical section
    (b) T-section
    (c) L-section
    (d) None of these
22. The portion of the slab which acts monolithically with the beam and which resists the compressive stresses, is called _____of flange of the T-beam
    (a) Length
    (b) Breadth
    (c) Thickness
    (d) Depth
23. The breadth of the flange of a T-beam is
    (a) 1/3rd of the effective span of the T-beam
    (b) Twelve times the depth of slab plus breadth of rib.

(c) Centre to centre distance between the adjacent beam.
(d) Least of (a) , (b) or (c)

24. In a T-beam , the breadth of the rib is equal to the
    (a) Total thickness of the slab, including cover
    (b) Width of the portion of the beam in the compression zone
    (c) Width of the portion of the beam in the compression zone
    (d) All the above.
25. The thickness of flange in a T-beam is taken equal to the total thickness of the slab, including cover.
    (a) True
    (b) False
    (c) Not known
    (d) None of these
26. Slab forms the compression flange of the T-beam
    (a) Yes
    (b) No
    (c) Not known
    (d) None of these
27. The breadth of rib in a T-beam should at least be equal to _____the depth of rib
    (a) One –half
    (b) One –third
    (c) One-fourth
    (d) One –sixth
28. In a T-beam, the vertical distance between the bottom of the flange and the centre of the tensile reinforcement is
    (a) Breadth of flange
    (b) Thickness of flange
    (c) Breadth of slab
    (d) Depth of rib
29. The effective depth of a T-beam is the distance between the
    (a) Centre of the flange and the top of the tensile reinforcement
    (b) Top of the flange and the centre of the tensile reinforcement
    (c) Bottom of the flange and the centre of the tensile reinforcement
    (d) Centre of the flange and the bottom centre of the tensile reinforcement
30. The neutral axis in a T-beam section falls
    (a) Within the flange
    (b) Outside the flange
    (c) Either (a) or (b)
    (d) All the above
31. When the neutral axis of T-beam falls outside the flange (below the slab), then
    (a) $Bd_s\left(n-\frac{d_s}{2}\right)=mA_{st}(d-n)$

(b) $Bd_s\left(n+\frac{d_s}{2}\right)=mA_{st}(d-n)$

(c) $Bd_s(n+ds)=mA_{st}(d+n)$

(d) None of these

32. For Q.No.31, the depth of the net compression $\left(\frac{\square}{y}\right)$ between the top of the beam is given by

(a) $\frac{\square}{y}=\frac{2n-ds}{n-ds}\times\frac{ds}{3}$

(b) $\frac{\square}{y}=\frac{3n-2ds}{2n-ds}\times\frac{ds}{3}$

(c) $\frac{\square}{y}=\frac{n-ds}{2n-ds}\times\frac{ds}{3}$

(d) $\frac{\square}{y}=\frac{2n-ds}{3n-2ds}\times\frac{ds}{3}$

33. The moment of resistance of a T-beam where the neutral axis falls in the web is

(a) $\sigma_{\downarrow}cbc\times B\times d_{\downarrow}s\times(d-\square(/y))$

(b) $\sigma_{\downarrow}cbc\times B\times d_{\downarrow}s\times(d+\square(/y))$

(c) $\sigma_{\downarrow}cbc\times B\times d_{\downarrow}s\times(0.5d-\square(/y))$

(d) $\sigma_{\downarrow}cbc\times B\times d_{\downarrow}s\times(d+\square(/y))$

34. When a vertical member is carry by mainly axial loads, is called as

(a) Strut

(b) Column

(c) Tie

(d) All of these

35. Along column is one whose ratio of effective length to its least lateral dimension exceeds

(a) 5

(b) 10

(c) 12

(d) 20

36. The analysis of slab spanning in one direction is done by assuming it to be a beam of

(a) 1m length

(b) 1m width

(c) 1m

(d) None of these

37. The purpose of transverse reinforcement, in a slab is to

(a) Distribute the effect to f point load on the slab more evenly and uniformly

(b) Distribute the shrinkage and temp cracks more ever

(c) Keep the main reinforcement in position

(d) All of the above.

38. In a slab, the transverse reinforcement is provided at _____to the span of the slab

(a) 45^0

(b) 60^0
(c) 90^0
(d) 180^0

39. The distribution reinforcement is also called _____reinforcement.
    (a) Longitudinal
    (b) Transverse
    (c) Main
    (d) None of the these
40. The diameter of bars for main reinforcement in slabs, may be
    (a) 2 to 4mm
    (b) 4 to 8mm
    (c) 8 to 14mm
    (d) 14 to 18mm

ANSWER:

1(d),2(c),3(a),4(b),5(b),6(a),7(d),8(a),9(a),10(c),11(b),12(d),13(c),14(c),15(d),16(b),17(d),18(d),19(b),20(b),21(b),22(b),23(d),24(c),25(a),26(a),27(b),28(d),29(b),30(c),31(a),32(b),33(a),34(b),35(c),36(b),37(d),38(c),39(b),40(c)

TEST-6

Sub-R.C.C

Time :1hour
Total Marks-40
Name of the Student:-

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1. The pitch of bars of main reinforcement in slab should not exceed _____the effective depth of slab.
    (a) Double
    (b) Three times
    (c) Five times
    (d) Six times

2. If plain bars are used, the area of distribution reinforcement in slabs should not less than
   (a) 0.12% of the gross area f concrete
   (b) 0.15% of the gross area of concrete
   (c) 0.18% of the gross area of concrete
   (d) 0.20% of the gross area of concrete
3. If high yield strength deformed bars are used, the are of distribution reinforcement in slabs, should not less than.
   (a) 0.12% of the gross area of concrete
   (b) 0.15% of the gross area of concrete
   (c) 0.18% of the gross area of concrete
   (d) 0.20% of the gross area of concrete
4. The diameter of bars used for distribution reinforcement in slabs, may vary from
   (a) 2 to 4mm
   (b) 4 to 6mm
   (c) 6mm to 8mm
   (d) 8 to 12mm
5. If the maximum bending moment of a simply supported slab in M and moment of resistance factor is R, then the effective depth of slab (d) is given by
   (a) $d=\frac{M}{\sqrt{100R}}$
   (b) $d=\frac{\sqrt{M}}{100R}$
   (c) $d=\sqrt{\frac{M}{100R}}$
   (d) $d=\frac{M}{100R}$
6. in a simply supported slab, the pitch of distribution reinforcement should not be more than_____the effective depth of slab or 60cm which ever is smaller.
   (a) Double
   (b) Three times
   (c) Five times
   (d) Six times
7. The clear cover in a simply supported slab should not be less than the diameter of the reinforcing bar
   (a) Correct
   (b) Incorrect'
   (c) Not known
   (d) None of these

8. When a slab is continuous over several spans, negative (i.e. hogging) bending moment is induced over the
   (a) End supports
   (b) Intermediate supports
   (c) Both (a) & (b)
   (d) Non of the
9. The reinforcement in a continuous slab is provided
   (a) At the top of the slab portion over the intermediate supports.
   (b) At the bottom of the slab portion over the intermediate supports.
   (c) All the middle of the slab portion over the intermediate supports
   (d) All the above
10. For a slab continuous over two equal spars, the maximum bending moment near the centre of each span is taken as:
   (a) $-\frac{WL^2}{8}$
   (b) $+\frac{WL^2}{8}$
   (c) $-\frac{WL^2}{8}$
   (d) $+\frac{WL^2}{8}$
11. Find the correct statement from the followings.
   (a) For a cantilever slab, the ratio of span to overall depth should not 12.
   (b) One way slab which carry uniformly distributed load should be designed to resist a sagging bending moment near mid-span.
   (c) When the slab is built into a brick or masonry wall the slab should be designed to resist a hogging moment at the face of the support.
   (d) All of the above.
12. When the slab is supported on all the four edges and the ratio of long span to short span is small, bending takes place along both the spans, such a slab is known as
   (a) Slab spanning in one direction
   (b) One way slab.
   (c) Slab spanning in two direction.
   (d) Two-way slab.
13. A two way slab
   (a) May be simply supported on the four edges, with comers not held down and carrying uniformly distributed load.
   (b) May be simply supported on the four edge , with corners held down and carrying uniformly distributed load.
   (c) May have edges fixed or continuous and carrying uniformly distributed load.
   (d) All the above.
14. A slab simply supported on the four edges, with corners not held down and carrying uniformly distributed load, is used in

(a) Singly storeyed buildings.
(b) Double storeyed buildings.
(c) Multi storeyed buildings
(d) All the above

15. The reinforcement in the short span is placed_____the reinforcement in the long span.
    (a) Below
    (b) Above
    (c) Middle
    (d) None of these
16. The maximum bending moment and deflection for two way slab is much _____-____than that of a one wayslad.
    (a) Greater
    (b) Smaller
    (c) Equal
    (d) All of these
17. According to Grushoff-rankine theory for a two way slab
    (a) $\frac{W_x}{W_y} = \frac{L_y}{L_x}$
    (b) $\frac{W_x}{W_y} = \left(\frac{L_y}{L_x}\right)^3$
    (c) $\frac{W_x}{W_y} = \left[\frac{L_y}{L_x}\right]^2$
    (d) $\frac{W_x}{W_y} = \left(\frac{L_y}{L_x}\right)^4$
18. If the sides o a slab simply supported on its edges and spanning in two way are equal, then the maximum bending moment is multiplied by.
    (a) 0.25
    (b) 0.50
    (c) 0.75
    (d) 0.85
19. A reinforcing slab, build monolithically with the supporting columns and is reinforced in two or more directions, without any provision of beams is called a
    (a) Two way slab
    (b) Flat slab
    (c) Continus slab
    (d) Cireulashion
20. In a simply supported slab, alternate bars are curtailed at
    (a) $1/4^{th}$ of the span
    (b) $1/5^{th}$ of the span
    (c) $1/6^{th}$ of the span

(d) $1/7^{th}$ of the span

21. The floor slab of a building is supported on reinforced cement floor beams. The ratio of the end and intermediate span is kept.
    (a) 0.7
    (b) 0.8
    (c) 0.9
    (d) 0.6
22. The effective span of a simply supported slab is
    (a) Distance between the centers of the bearings
    (b) Clear distance between the inner faces of the walls plus twice he thickness of the slab.
    (c) Cleat spa plus effective depth of the slab.
    (d) All the above
23. The maximum ratio of span to depth of a slab simply supported and spanning in one direction is
    (a) 35
    (b) 25
    (c) 30
    (d) 20
24. The maximum ratio of span to depth of a slab simple supported and spanning in two directions, is
    (a) 25
    (b) 30
    (c) 35
    (d) 40
25. The maximum ratio of span to depth of a cantilever slab is
    (a) 8
    (b) 10
    (c) 12
    (d) 14
26. The amount of reinforcement for main bars in a slab, is based upon
    (a) Maximum bending moment
    (b) Minimum bending moment
    (c) Maximum shear force
    (d) Minimum shear force
27. The transverse reinforcements provided at right angles to the main reinforcement.
    (a) To distribute the load.
    (b) To resist the temp stresses
    (c) To resist the shrinkage stresses
    (d) All the above
28. The weight of reinforced concrete is generally take as
    (a) 2300 kg/m^3

(b) 2400 kg/m^3
(c) 2500kg/m^3
(d) 2800kg/m^3

29. If the permissible compressive stress for a concrete in bending is ckg/m^2, the modular ratio is
    (a) 2800/C
    (b) 2300/C
    (c) 2800/3C
    (d) 2800/4C
30. For a continuous slab supported at ends and carried over intermediate beams.
    (a) Max [3] sagging B.M for the end spans=$WL^2/10$
    (b) Max [3]hogging B.M. at support next of the end support=$-WL^2/10$
    (c) Max [3]sagging B.M for the interior span=$+WL^2/12$
    (d) Max [3]hogging B.M at other interior support=$-WL^2/12$
    (e) All the above

ANSWER:

1(b),2(b),3(a),4(c),5(c),6(c),7(a),8(b),9(a),10(d),11(d),12(c),13(d),14(a),15(a),16(b),17(d),18(b),19(b),20(d),21(c),22(c),23(c),24(c),25(c),26(a),27(d),28(d),29(d),30(e),