B.E. CIVIL

ADMISSION TEST

FOR

Aligarh Muslim University

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SOLVED

Previous years original

Test Papers

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Kamal Publication

Agra

Uttar Pradesh

B.E.C-1

B.E.Civil- 2017-2018

2017-18

1. If $\left(1+\sqrt{1+x}\right)\tan x = 1+\sqrt{1-x}$, then $\sin 4x$ is equal to
   (a) $4x$ (b) $2x$ (c) x (d) $3x$
2. The complex number $z = x + iy$ which satisfies $\left|\frac{z-5i}{z+5i}\right| = 1$ lies on
   (a) the axis of x (b) the straight line $y = 5$
   (c) circle through the origin (d) the axis of y
3. The number of six digit numbers that can be formed from the digits 1, 2, 3, 4, 5, 6 and 7 so that the digits do not repeat and the terminal digits are even is
   (a) 144 (b) 72 (c) 288 (d) 720
4. The value of $9^{1/3} \times 9^{1/9} \times 9^{1/27} \times \ldots\ldots\infty$, is
   (a) 9 (b) 1 (c) 3 (d) None of these
5. If $\cos^{-1} x - \cos^{-1}\frac{y}{2} = \alpha$, then $4x^2 - 4xy\cos\alpha + y^2$ is equal to
   (a) $-4\sin^2\alpha$ (b) $4\sin^2\alpha$ (c) 4 (d) $2\sin^2\alpha$
6. If the axes are rotated through an angle of 30° in the clockwise direction, the point $(4, 2\sqrt{3})$ in the new system is
   (a) (2, 3) (b) $(2, \sqrt{3})$ (c) $(\sqrt{3}, 2)$ (d) $(\sqrt{3}, 5)$
7. If the curves $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{c^2}+\frac{y^2}{d^2}=1$ intersect orthogonally, then
   (a) $a^2 - b^2 = c^2 - d^2$ (b) $a^2 - c^2 = b^2 - d^2$
   (c) $a^2b^2 = c^2d^2$ (d) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c^2}+\frac{1}{d^2}$
8. The locus of the foot of perpendicular drawn from the centre of the ellipse $\frac{x^2}{a^2}\frac{y^2}{b^2}=1$ on any tangent is
   (a) $(x^2 - y^2)^2 = a^2x^2 + b^2y^2$ (b) $(x^2 - y^2)^2 = a^2x^2 - b^2y^2$
   (c) $(x^2 + y^2)^2 = a^2x^2 + b^2y^2$ (d) $(x^2 + y^2)^2 = a^2x^2 - b^2y^2$
9. The value of $\lim_{x\to 0}\frac{(1+x)^{\frac{1}{x}}-e}{x}$, is
   (a) 1 (b) $\frac{e}{2}$ (c) $-\frac{e}{2}$ (d) $\frac{2}{e}$
10. If $f(x) = \begin{cases} \sin x, & x < 0 \\ \cos x - |x-1|, & x \geq 0 \end{cases}$ then $g(x) = f(|x|)$ is non-differentiable for
    (a) No value of x (b) Exactly one value of x
    (c) Exactly three values of x (d) None of these

11. Let $f(x)$ satisfy the requirement of Lagrange's mean value theorem in $[0, 2]$. If $f(0) = 0$ and $|f'(x)| \leq \frac{1}{2}$ for all $x \in [0, 2]$ them
(a) $f(x) \leq 2$ (b) $|f(x)| \leq 1$
(c) $f(x) = 2x$ (d) $f(x) = 3$ for at least one x in $[0, 2]$

12. $\int \frac{1}{(2x-7)\sqrt{x^2-7x+12}} dx$ is equal to
(a) $2\sec^{-1}(2x-7)+C$ (b) $\sec^{-1}(2x-7)+C$
(c) $\frac{1}{2}\sec^{-1}(2x-7)+C$ (d) None of these

13. $\int_0^{\pi/2} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx =$
(a) $\pi/3$ (b) $\pi/2$ (c) $\pi/4$ (d) π

14. The solution of the differential equation $\frac{dy}{dx} + 1 = e^{x \ y}$ is
(a) $(x + y)\, e^{x \ y} + c = 0$ (b) $(x + c)\, e^{x \ y} = 0$
(c) $(x - c)\, e^{x \ y} = 1$ (d) $(x - c)\, e^{x \ y} + 1 = 0$

15. Let $\vec{a}$ and $\vec{b}$ be two unit vectors. If the vectors $\vec{c} = \vec{a} + 2\vec{b}$ and $\vec{d} = 5\vec{a} - 4\vec{b}$ are perpendicular to each other, then the angle between $\vec{a}$ and $\vec{b}$ is
(a) $\pi/6$ (b) $\pi/2$ (c) $\pi/3$ (d) π

16. In the Young's double slit experiment using a monochromatic light of wavelength λ, the path difference (in terms of an integer n) corresponding to any point having half the peak intensity is
(a) $(2n + 1)\frac{\lambda}{2}$ (b) $(2n + 1)\frac{\lambda}{4}$ (c) $(2n + 1)\frac{\lambda}{8}$ (d) $(2n + 1)\frac{\lambda}{16}$

17. In a LCR series circuit, the potential difference between the terminals of the inductance is 60 V, between the terminals of the capacitor is 30 V and that across the resistance is 40 V. Then supply voltage will be
(a) 50 V (b) 70 V (c) 130 V (d) 10 V

18. An infinite number of charges each equal to q are placed along the x-axis at $x = 1m$, $x = 2m$, $x = 4m$, $x = 8m$..... and so on. The electric potential at the point $x = 0$ due to this set of charges will be
(a) $\frac{q}{\pi\epsilon_0}$ (b) $\frac{q}{2\pi\epsilon_0}$ (c) $\frac{q}{3\pi\epsilon_0}$ (d) $\frac{q}{4\pi\epsilon_0}$

2017

If the change in th
of the earth is the
(assuming h << R
(a) $x = h^2$ (b)
A mass of kg is r
whose efficiency
mass is now rele
shall be
(a) 5000 J (b
The gastric juic
acid to make th
mole/litre. The
(a) 1 (
Common name
(a) Acetylene
(c) Ethyl acety
Hypalon is
(a) Chlorosulp
(b) Polyuretha
(c) Polysulphi
Which among
cookware?
(a) PVC
(c) Polystyre
Gas tempera
(a) 8000 to
(c) 1000 to
The type of
inclined for
(a) Friction
(c) Batter p
The bindin
(a) Gypsur
Choose th
(a) The an
equal to 1

If the change in the value of g at a height h above the surface of the earth is the same as a depth x below its surface, then (assuming $h << R$, R is radius of earth)

(a) $x = h^2$ (b) $x = \frac{h}{2}$ (c) $x = 2h$ (d) $x = h$

A mass of kg is raised through a certain height by a machine whose efficiency is 90%; the energy spent is 5000 J. If the mass is now released, its kinetic energy on hitting the ground shall be

(a) 5000 J (b) 4500 J (c) 4000 J (d) 5500 J

The gastric juice in our stomach contain enough hydrochloric acid to make the hydrogen ion concentration about 0.01 mole/litre. The pH value of the gastric juice is

(a) 1 (b) 2 (c) 7 (d) 8

Common name of the given compound is $CH_3 - C \equiv CH$

(a) Acetylene (b) Methyl acetylene
(c) Ethyl acetylene (d) Dimethyl acetylene

Hypalon is

(a) Chlorosulphonated polyethylene rubber
(b) Polyurethane rubber
(c) Polysulphide rubber (d) Butyl rubber

Which among the following is used to make non-stick cookware?

(a) PVC (b) Polytetrafluoroethylene
(c) Polystyrene (d) Nylon-6

Gas temperature in the rocket motor run from

(a) 8000 to 10000°F (b) 5000 to 6000°F
(c) 1000 to 1800°F (d) None of the above

The type of pile which is driven at an inclination to resist inclined forces is known as

(a) Friction pile (b) Sheet pile
(c) Batter pile (d) Anchor pile

The binding material present in asphalt is

(a) Gypsum (b) Lime (c) Bitumen (d) Surkhi

Choose the incorrect statement

(a) The anchorage value of a standard U-type hook shall be equal to 16 times the diameter of bar

(b) Design bond stress in limit state method for M25 grade concrete and Fe415 rebars in tension shall be 1.4 N/mm^2
(c) Where the depth of the web in a beam exceeds 750 mm, side face reinforcement shall be provided along the two faces
(d) The diameter of reinforcing bars shall not exceed one-eight of the total thickness of the slab

29. The moulding provided under nosing to beautify the elevation of the step is known as
(a) Flier (b) Scotia (c) Newel (d) Balustrade

30. Vaporization of entrapped moisture or solvent in case of a painted surface, leads to a defect called
(a) Blistering (b) Efflorescence (c) Blooming (d) Bleeding

31. Which of the following workability tests is most suitable for concrete of very low workability?
(i) Slump test (ii) Compaction factor test (iii) Vee-Bee test
The correct answer is
(a) Only (i) (b) Only (iii) (c) (i) and (ii) (d) (i) and (iii)

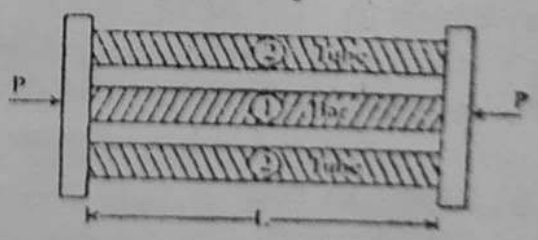
32. The bond strength between steel reinforcement and concrete is affected by
(i) Steel properties (ii) Concrete properties
(iii) Shrinkage of concrete
The correct answer is
(a) (i) and (ii) (b) (ii) and (iii)
(c) (i) and (iii) (d) (i), (ii) and (iii)

33. A composite section is subjected to compressive force (s) as shown in figure. The force P_1 in the bar is given by

(a) $P_1 = \dfrac{P}{A_2E_2/A_1E_1}$

(b) $P_1 = \dfrac{P_2}{A_1E_1/A_2E_2}$

(c) $P_1 = \dfrac{P}{1+\frac{A_2E_2}{A_1E_1}}$ (d) $P_1 = \dfrac{P}{1+\frac{A_1E_1}{A_2E_2}}$



34. A stone is rejected if it absorbs water more than
(a) 10% (b) 15% (c) 20% (d) 25%

35. A flat slab is supported
(a) On beams (b) On columns (c) On beams and columns
(d) On columns monolithically built with slab

36. A material may fail if
(a) maximum principal stress exceeds the direct stress, σ_0

(b) maximum strain exceeds $\frac{\sigma_0}{E}$

(c) maximum shear stress exceeds $\frac{\sigma_0^2}{2E} \times$ volume

(d) all of the above

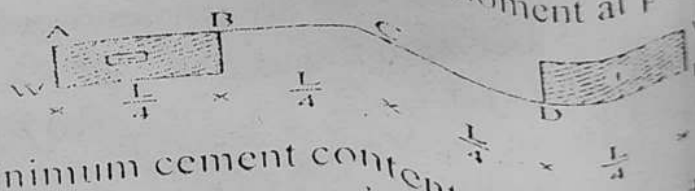
[Note σ_0 = Direct stress, E = Young's modules of elasticity]

37. The equivalent wooden section for the flitched beam section shown below in flexure is

(a) b + m(2t) and d
(b) b + 2t and md
(c) 2b + mt and d
(d) 2b + 2mt and d

38. A 3 m long cantilever beam carries a uniformly distributed load over the entire length. If slope at the free end is 1°, the deflection at the free end is
(a) 30.27 mm (b) 39.27 mm (c) 49.27 mm (d) 60.27 mm

39. For the beam with SFD given below, bending moment at point C is



(a) $\frac{WL}{2}$ (b) $\frac{WL}{3}$
(c) $\frac{WL}{4}$ (d) $\frac{WL}{6}$

40. As per IS 456-2000, minimum cement content for reinforced concrete grade M30 and severe exposure is
(a) 300 kg/ m^3 (b) 310 kg/ m^3
(c) 320 kg/ m^3 (d) 325 kg/ m^3

41. If a two hinged parabolic arch is subjected to uniformly distributed load w/m over entire horizontal beam, then horizontal thrust will be
(a) $\frac{wl^2}{3h}$ (b) $\frac{wl^2}{4h}$ (c) $\frac{wl^2}{6h}$ (d) $\frac{wl^2}{8h}$

42. For a thick and heavily reinforced structure, workability of concrete should be
(a) high (b) medium (c) low (d) zero

43. The crushing strength of a good quality brick should not be less than
(a) 45 kg/cm^2 (b) 55 kg/cm^2 (c) 75 kg/cm^2 (d) 105 kg/cm^2

44. Columns of given length, cross-section and material have different values of buckling loads for different end conditions. The strongest column is one whose

One end is fixed and the other end hinged
Both ends are hinged
One end is fixed and other end free
Both ends fixed

hin cylindrical vessel of mean diameter D and of length 'L' sed at both ends is subjected to a water pressure 'p'. The ie of hoop stress and longitudinal stress in the shell shall be pectively

(a) $\frac{pD}{2t}, \frac{pD}{4t}$ (b) $\frac{pD}{4t}, \frac{pD}{8t}$ (c) $\frac{pD}{8t}, \frac{pD}{8t}$ (d) $\frac{pD}{t}, \frac{pD}{2t}$

ich type of following cement is used for mass concrete rk?

High alumina cement (b) Quick setting cement
Rapid hardening cement (d) Low heat cement

e cross-sectional area of the longitudinal reinforcement shall be less than

1% of the gross cross-sectional area of the column
6% of the gross cross-sectional area of the column
0.6% of the gross cross-sectional area of the column
0.8% of the gross cross-sectional area of the column

otal elongation produced in a bar due to its self weight is ven as (ρ is the density of material in kg/m^3)

(a) $\frac{9.81\,\rho l^2}{E}$ (b) $\frac{9.81\,\rho l^2}{2E}$ (c) $\frac{9.81\,\rho l}{E}$ (d) $\frac{9.81\,\rho l}{2E}$

esence of whitish spots or streaks in timber indicates early ecay because of

Foxiness (b) Doatiness (c) Drunkiness (d) Sound knot

e radius of a bar bend to form a hook, should not be less an

twice the diameter (b) thrice the diameter
four times the diameter (d) five times the diameter

reinforced concrete T beam (in which flange is in mpression), the position of neutral axis will
) be within the flange (b) be within the web
) depend on the thickness of flange in relation to total depth
d percentage of reinforcement
) be at the junction of flange and web

52. Which of the following option gives partial safety factors of DL and WL for limit state of collapse when stability against overturning is critical?
(a) 0.9 DL + 1.5 WL (b) 1.5 DL + 1.5 WL
(c) 1.2 DL + 1.2 WL (d) 1.4 DL + 0.6 WL

53. A frame, in which the number of members is more than $2j - 3$, is known as
(a) perfect frame (b) deficient frame
(c) redundant frame (d) sway frame

54. When a tensile or compressive force 'p' acts on a body, the change in its length is given by
(a) PL/AE (b) AE/PL (c) PE/AL (d) PA/LE
Where L = length, A = cross sectional area and E = Young's modulus of elasticity.

55. The limiting value of depth of neutral axis for Fe415 grade steel is
(a) $0.48d$ (b) $0.53d$ (c) $0.46d$ (d) $0.5d$
Where b is the width and D the total depth of beam.

56. For the given loading on beam BMD variation is

(a) parabolic (b) linear (c) cubic parabola (d) none of the above

57. For T beam action the following conditions are required
(i) the web and the flange (slab) of the beam should be tied by shear stirrups
(ii) the main reinforcement of the slab supporting the beam should extend into the slab (flange) on top of beam from both sides of slab by 0.3 times the slab span
(iii) the web and the flange (slab) should be cast monolithically
(iv) all of the above
Which of the following statements are correct?
(a) (i) and (iii) only (b) (i) and (ii) only
(c) (iv) only (d) (ii) only

58. An error of 1% in the measurement of head in a rectangular notch, causes an error of
(a) 0.5% in the discharge (b) 1% in the discharge
(c) 1.25% in the discharge (d) 1.5% in the discharge

59. According to Khosla's theory of independent variables for seapage below a hydraulic structure, the exit gradient, in the absence of a downstream sheet pile is
(a) 0 (b) 1.0 (c) ∞ (d) 10.0

60. Middle third rule is associated with design of
(a) Airports (b) Buildings (c) Bridges (d) Dams

61. For a triangular channel section specific energy E_c is given by
(a) $1.5\ y_c$ (b) $1.25\ y_c$ (c) $2.0 y_c$ (d) $1.75 y_c$
Where y_c is critical depth.

62. A canal fall can be used as a meter fall if shape of its crest is
(a) Sharp crested weir type (b) Broad crested weir type
(c) Ogee shape (d) Semicircular shape

63. In case of gravity dam, total pressure produced by waves is computed using
(a) $P_w = 2.4\ wh_w^2$ (b) $P_w = 2\ wh_w^2$
(c) $P_w = 3.2\ wh_w^2$ (d) $P_w = 4.2\ wh_w^2$
Where w is specific weight of water and h_w is the wave height.

64. If h is the ordinate of hydraulic gradient line above the top of the floor and G is specific gravity of floor material, then the thickness of floor is given by the formula
(a) $\frac{h}{G+1}$ (b) $\frac{h-1}{G-1}$ (c) $\frac{h}{G-1}$ (d) $\frac{h-1}{G}$

65. If the head H_o over an overflow spillway is less than the design head H_d
(a) the pressure on the spillway crest will be negative
(b) the cavitation phenomenon can occur
(c) the separation of the streamlines from the surface can occur
(d) the coefficient of discharge C_o will be less than the design coefficient of discharge C_{do}

66. A parabolic sharp crested weir has profile given by $x^2 = Ky$. The discharge in the weir is given by $Q = KH^n$ where n is
(a) 0.5 (b) 1.5 (c) 2.0 (d) 2.5

67. The ratio of average velocity to maximum velocity for steady laminar flow in circular pipes is
(a) 1/2 (b) 2/3 (c) 3/2 (d) 2

68. According to Dicken's formula for estimating floods, the peak discharge is proportional to
(a) A (b) $A^{1/2}$ (c) $A^{2/3}$ (d) $A^{3/4}$

69. If a sphere of diameter 1 cm falls in castor oil of kinetic viscosity 10 stokes, with a terminal velocity of 1.5 cm/s, the coefficient of drag on the sphere is
(a) less than 1 (b) between 1 to 100 (c) 160 (d) 200

70. The clarifloccculator is the unit in which the following things will occur
(a) floc formation and its subsequent removal by filtration
(b) floc formation and its subsequent removal by sedimentation
(c) floc formation and its subsequent removal by decantation
(d) removal of bacteria by filtration and chlorination

71. The hardness that is equivalent to the alkalinity is termed as
(a) Non carbonate hardness (b) Carbonate hardness
(c) Both carbonate and non carbonate hardness
(d) None of the above

72. Sludges from the following treatment units are directly discharged to sludge drying beds without undergoing anaerobic digestion
(a) Aeration tank of activated sludge process
(b) Extended aeration system
(c) Trickling filter (d) R.B.C

73. Parshall flumes are used in water/ waste water treatment plants
(a) Measure flow rates (b) Measure BOD
(c) Measure suspended solids (d) Measure pesticides

74. In a watershed groundwater is more mineralized in
(a) Recharge zone (b) Confluence zone
(c) Discharge zone (d) Middle of watershed

75. High fluoride content in water can cause
(a) Tenderness of the bones and children may get mottled teeth
(b) Damage of kidneys
(c) Nerve damage or thyroid problems(d) Bone disintegration

76. Organo chlorine based pesticides are
(a) Endocrine disruptors (b) Stimulators of metabolisms
(c) Energy carriers (d) Coagulants

77. Which of the following is incorrect statement?
(a) Anaerobic digesters are used for sludge treatment
(b) Sludge production is more in activated sludge process as compared to anaerobic reactors

(c) Yield coefficient of anaerobic bacteria is more than aerobic bacteria
(d) N and P addition is required in activated sludge process

78. Rising mains are used to carry
(a) Sewage from branch sewer to main sewer
(b) From houses to main sewer
(c) From sewage pumping station to STP
(d) From STP to rivers

79. Following pond is used for disinfection of waste water
(a) Facultative pond (b) Anaerobic pond
(c) Maturation pond (d) Polishing pond

80. The following bench mark is established with highest degree of precision
(a) Permanent bench mark (b) G.T.S. bench mark
(c) Temporary bench mark (d) Arbitrary bench mark

81. Which of the instrument is generally not used in reconnaissance survey?
(a) Pedometer (b) Sextant (c) Total station (d) Compass

82. Axis method of adjustment of closing error of a traverse is best suited when
(a) Errors are in angular measurements only
(b) Errors are in linear measurements only
(c) Errors are in both linear and angular measurements
(d) Errors due to local attraction

83. The sensitiveness of a level tube decreases if
(a) Radius of curvature of its inner surface is increased
(b) Diameter of the tube is increased
(c) Length of the vapour bubble is increased
(d) Both viscosity and surface tension are increased

84. Closing error in a stadia traverse should not exceed
(a) $0.01p$ (b) $0.055\sqrt{p}$ (c) $0.01\sqrt{p}$ (d) $20p$
Where p is the perimeter of traverse.

85. The length of Gunter's chain is kept as 66 feet because it
(a) Measures distance in feet and area in hectares
(b) Suitable for measuring distances in miles
(c) Suitable for cadastral survey
(d) Suitable for use in plane table survey

86. Reverse curve is provided when

(a) Straights are parallel or include a small angle
(b) In compound curves
(c) Between a straight and a circular curve
(d) When a positive grade meets a negative grade

87. The correction due to the curvature in leveling is
(a) $\frac{d^2}{2R}$ (b) $\frac{2}{5}\left[\frac{d^2}{2R}\right]$ (c) $\frac{d^2}{R}$ (d) $\frac{d^2}{4R}$

88. The smaller horizontal angle between the true meridian and a survey line, is known as
(a) Declination (b) Bearing (c) Azimuth (d) Dip

89. In a Proctor compaction test, the dry density of the soil was found to be 1.8 g/cc. The specific gravity of the same soil is 2.70, the void ratio of soil will be
(a) 0.25 (b) 0.50 (c) 0.60 (d) 0.75

90. On a horizontal curve, if the pavement is kept horizontal across the alignment then the pressure on the outer wheels will be
(a) More than the pressure on inner wheels
(b) Less than the pressure on inner wheels
(c) Equal to pressure on inner wheels (d) Zero

91. Which of the following errors is eliminated by taking readings in both the faces
(a) Error due to curvature of the earth
(b) Error due to refraction (c) Personal errors
(d) Error in collimation adjustment

92. As per IRC classification of loading for highway bridges, magnitude of each track of IRC class AA loading is
(a) 700 KN (b) 350 KN (c) 114 KN (d) 68 KN

93. The value of compression index of soil
(a) Decreases with the increase in liquid limit
(b) Increases with the increase in liquid limit
(c) Decreases with the increase in plastic limit
(d) Increases with the increase in plastic limit

94. Cant deficiency occurs when a vehicle travels around a curve
(a) equilibrium speed(b) speeds higher than equilibrium speed
(c) speeds lower than equilibrium speed(d) booked speed

95. For water bound Macadam roads in the area of heavy rainfall, the recommended value of camber is
(a) 1 in 30 (b) 1 in 36 (c) 1 in 48 (d) 1 in 60

96. Which of the following statements is true for consolidated drained (CD or D) test?
(a) Drainage is permitted only in the shearing stage
(b) It is a quick test
(c) Pore pressure remains zero at all stages
(d) This test yields total stress parameters (C and ϕ)

97. In which type of soil, honey combed structure is generally encountered?
(a) Sand and silt (b) Black cotton soil
(c) Well-graded gravel (d) Clay of high compressibility

98. On increasing the compactive effort in the proctor's compaction test, the variations in maximum dry density (MDD) and optimum moisture contest (OMC) are
(a) MDD decreases and OMC increases
(b) Both MDD and OMC increase
(c) MDD increases and OMC decreases
(d) MDD decreases with the decrease in OMC

99. The difference between maximum void ratio and minimum void ratio of a sand sample is 0.30. If the relative density of this sample is 66.6% at a void ratio of 0.40, then the void ratio of this sample at its loosest state will be
(a) 0.40 (b) 0.60 (c) 0.70 (d) 0.75

100. The length of vertical curves on highways is calculated on the basis of
(a) Super elevation (b) The rate of change of grade
(c) Sight distance (d) Rate of change in radial acceleration

Answers:-B.E.Civil-(2017-2018) Paper series-B

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