# PSC Assistant Engineer - Civil - Archaeology / Asst Engineer - Civil - Head Draftsman - Civil - Agriculture - Engineering Wing Examination
# Previous Year Question Paper

***Exam Name:*** ***Assistant Engineer - Civil - Archaeology / Asst Engineer - Civil - Head Draftsman - Civil - Agriculture - Engineering Wing***

***Date of Test : 30.07.2015***

***Question Paper Code: 143/2015***

***Medium of Questions: English***

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# 143/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Most chemically active concrete aggregate are from :
   (A) Igneous rock (B) Sedimentary rock
   (C) Metamorphic rock (D) Sand stones

2. Common sugar added to concrete :
   (A) Increases the strength of concrete (B) Retards the setting of concrete
   (C) Accelerates the setting of concrete (D) Gives colour to concrete

3. Air permeability test is done to measure :
   (A) Setting time of cement (B) Soundness of cement
   (C) Chemical composition of cement (D) Fineness of cement

4. ASCU is :
   (A) A damp proofing material for concrete (B) A preservative for timber
   (C) A type of brick bond (D) A type of building finish

5. For concrete exposed to dry conditions, the minimum curing period is :
   (A) 5 days (B) 7 days
   (C) 10 days (D) 14 days

6. A window that projects outside the external walls of a room is :
   (A) Gable window (B) Sash window
   (C) Dormer window (D) Bay window

7. A floor slab supported directly on column is called :
   (A) Ribbed slab (B) Flat slab
   (C) Flat plate (D) Grid floor

8. Service plan :
   (A) is drawn to a scale not less than that of site plan
   (B) include layout of existing water supply system
   (C) shows predominant wind direction
   (D) all the above



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9. The notational colour for existing hazardous building in a site plan is :
   (A) Black (B) Red
   (C) Purple (D) Dark blue

10. For a rectangular foundation of width b, eccentricity of load should not exceed :
   (A) b/2 (B) b/3
   (C) b/5 (D) b/6

11. The projecting ornamental course at the junction of a wall and ceiling :
   (A) Coping (B) Corbel
   (C) Cornice (D) Parapet

12. Group B buildings are :
   (A) residential (B) institutional
   (C) assembly (D) educational

13. Roof trusses are generally used when the span exceeds :
   (A) 3m (B) 5m
   (C) 10m (D) 15m

14. In struck pointing, the face of the pointing is :
   (A) flat (B) sloping outwards
   (C) vertical but pressed inside (D) grooved

15. Minimum period before striking soffit formwork to slabs :
   (A) 21 days (B) 7 days
   (C) 3 days (D) 1 day

16. The line joining the optical centre of object glass to the centre of eye- piece of a telescope is :
   (A) Line of collimation (B) Line of sight
   (C) Axis of bubble tube (D) Axis of telescope

17. The line normal to the plumb line at all points :
   (A) Vertical line (B) Horizontal line
   (C) Datum line (D) Level line



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18. The staff readings taken at stations A, B, C, D from a single setup of the level are 0.535, 1.105, 2.155, 1.785. The station B is :

(A) Below A and D (B) Above C and D

(C) Between C and D (D) None of the above

19. The BS is 6.655 taken on BM of RL 400.000. If FS is 1.45, RL of the last station is :

(A) 394.795 (B) 401.450

(C) 405.205 (D) 406.655

20. The horizontal angle between the true meridian and magnetic meridian is known as :

(A) Declination (B) Dip

(C) Bearing (D) Local attraction

21. The fore and back bearing of a line differ exactly by :

(A) 360° (B) 180°

(C) 90° (D) 45°

22. The angles of elevation from A to the top and bottom of a rod of length 2 m held vertically at B are 45° and 30° respectively. The horizontal distance AB is :

(A) 4.732 m (B) 1.268 m

(C) 3.464 m (D) 0.789 m

23. The sun is at the Autumnal Equinox on :

(A) March 21 (B) June 21

(C) September 21 (D) December 21

24. Subsidiary station established as near the true triangulation station as possible is known as :

(A) Satellite station (B) Principal station

(C) Central station (D) Pivot station

25. A ladder of weight W is resting against a smooth vertical wall and a smooth floor. The minimum force to be applied at the floor end to keep it in equilibrium at angle $\theta$ with floor is :

(A) $W \tan \theta$ (B) $0.5 W \tan \theta$

(C) $W \cot \theta$ (D) $0.5 W \cot \theta$

26. The centre of gravity of a right circular hollow cone of diameter d and height h lies at a vertical distance of ———— from the base.

(A) h/2 (B) h/3

(C) h/4 (D) h/6



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27. A block of weight 20kN just begins to move along a horizontal surface on application of 5kN horizontal force. The coefficient of friction between block and surface is :

(A) 0.10 (B) 0.20

(C) 0.25 (D) 0.50

28. Which of the following is an incorrect assumption in the analysis of truss?

(A) All joints are pinned

(B) Loads applied at joints only

(C) All members are straight

(D) Weights of members are acting at their centres

29. During strain hardening :

(A) Material undergoes changes in atomic and crystalline structures

(B) Increased resistance to further deformation

(C) Stress strain diagram has positive slope

(D) All the above

30. Ability of a material to absorb energy within the elastic range :

(A) Toughness (B) Elasticity

(C) Stiffness (D) Resilience

31. A cantilever beam fixed at left end carries a udl w / unit length over the left half portion and a point load W at the free end. If L is the length of the beam, the bending moment at fixed end is :

(A) $WL/2 + wL^2/4$ (B) $wL/2 + WL^2/4$

(C) $wL + WL^2/8$ (D) $WL + wL^2/8$

32. A beam ABC, is simply supported at A and B and BC is overhanging. AB = L and BC = L/2 and it carries a point load P at C. The deflection at C is :

(A) $PL^2/24EI$ (B) $PL^3/8EI$

(C) $PL^3/48EI$ (D) $PL^2/16EI$

33. The Poisson's ratio of a material is 0.3 and Young's modulus is 200 GPa. Its Rigidity Modulus is :

(A) 77 GPa (B) 51 GPa

(C) 125 GPa (D) 333 GPa



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34. Bending moment M and torque T are applied on a solid circular shaft. If the maximum bending stress is equal to the maximum shear stress developed, M is equal to :

(A) T (B) 2T

(C) T/2 (D) T/4

35. Surface tension is caused by a force of ———— at the free surface.

(A) Adhesion (B) Cohesion

(C) Both (A) and (B) (D) Either (A) or (B)

36. Find the height of a mountain if pressure measured at its base and top are 74 cm and 60 cm of mercury respectively. Specific weight of air is 11.97 $N/m^3$ :

(A) 1000 m (B) 1750 m

(C) 2600 m (D) 1560 m

37. A stable submerged body has :

(A) Centre of gravity below centre of buoyancy

(B) Centre of gravity below metacentre

(C) Centre of gravity above centre of buoyancy

(D) Centre of gravity above metacentre

38. Poise is the unit of:

(A) Density (B) Velocity gradient

(C) Kinematic viscosity (D) Dynamic viscosity

39. The velocity distribution at any section of a pipe for steady laminar flow is :

(A) Linear (B) Exponential

(C) Parabolic (D) Constant

40. In flow through pipe, the efficiency of transmission under conditions of maximum power transmission is:

(A) 50% (B) 66.67%

(C) 70% (D) 95.9%

41. A rectangular channel will be most economical when the flow depth and bottom width are in the ratio

(A) 2:1 (B) 1:1

(C) 1:2 (D) 1:4



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42. Water flow in large sized pipes for large flow rates can be measured using :
(A) Orifices (B) Notches
(C) Venturi meter (D) Elbow meter

43. An inward flow reaction turbine :
(A) Impulse turbine (B) Francis turbine
(C) Pelton turbine (D) All the above

44. The amount of moisture present in the air expressed as mass per unit volume is:
(A) Absolute humidity (B) Saturation rate
(C) Vapour pressure (D) All the above

45. The salt concentration in irrigation water is generally measured by :
(A) SAR value (B) Electrical conductivity value
(C) pH value (D) BOD value

46. Optimum depth of kor – watering for rice is :
(A) 13.5 cm (B) 16.5 cm
(C) 19 cm (D) 20 cm

47. The crop period of a crop is 120 days. It requires 10 cm depth of water at every 10 days. Its delta is :
(A) 120 cm (B) 60 cm
(C) 12 cm (D) 6 cm

48. The water which cannot be extracted by the plants from the soil is called :
(A) Capillary water (B) Hygroscopic water
(C) Available moisture (D) Field capacity

49. The canal which is not supposed to do any irrigation is called :
(A) Major distributory (B) Minor distributory
(C) Branch canal (D) Main canal

50. The geological formation which contains and readily yields water to tube wells :
(A) Water table (B) Aquifer
(C) Aquiclude (D) Aquifuge

51. Type of cross – drainage work where canal is passed below the drainage is :
(A) Super passage (B) Aqueduct
(C) Inlet (D) Level crossing



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52. A reservoir which retains excess supplies during periods of peak flows and release them gradually during low flows :

(A) Retarding reservoir
(B) Flood control reservoir
(C) Distribution reservoir
(D) Conservation reservoir

53. A plot of cumulative rain versus time is called :

(A) Mass curve
(B) Hydrograph
(C) Hyetograph
(D) DAD curve

54. Example of subsurface source of water :

(A) River
(B) Ponds
(C) Spring
(D) Streams

55. The standard unit of turbidity of water is that which is produced by 1 mg of ——— dissolved in one litre of distilled water.

(A) Finely divided silica
(B) Platinum cobalt
(C) Potassium permanganate
(D) Formazin

56. A compound that imparts temporary hardness to water :

(A) Calcium sulphate
(B) Magnesium chloride
(C) Calcium nitrate
(D) Magnesium carbonate

57. Which of the following is incorrect regarding a slow sand filter :

(A) Incoming water should not be treated by coagulants
(B) Depth of water should be double the depth of filter sand
(C) Loss of head is limited to a maximum of 1.2 m
(D) Cleaning should not be done by back washing

58. A method of disinfection of drinking water :

(A) Treatment with excess lime
(B) Treatment with ozone
(C) Electra-Katadyn process
(D) All the above

59. BOD of effluent from secondary biological treatment of sewage is :

(A) 0 to 5% of the original
(B) 5 to 10% of the original
(C) 25 to 40% of the original
(D) 50 to 60% of the original



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60. During sludge digestion :

(A) Acidity condition should prevail
(B) Alkaline condition should prevail
(C) Acidity or alkaline condition
(D) Neutral condition should prevail

61. The disposal method in which solid waste is heated in an oxygen free atmosphere and reduced to gaseous, liquid and solid fractions :

(A) Pyrolysis
(B) Pulverisation
(C) Incineration
(D) Composting

62. The best system of plumbing of drainage work in building is :

(A) One pipe system
(B) Two pipe system
(C) Single stack system
(D) Partially ventilated single stack system

63. Water content of soil is 0.15, Degree of saturation 70%, void ratio is 0.61, then specific gravity is :

(A) 2.85
(B) 2.13
(C) 2.50
(D) 2.17

64. The numerical difference between liquid limit and plastic limit is :

(A) Liquidity index
(B) Plasticity index
(C) Consistency index
(D) Flow index

65. The intensity of vertical stress at depth z below a concentrated load Q, by Boussinesq equation is :

(A) $\sigma_z = 0.5775 \frac{Q}{z^2}$
(B) $\sigma_z = 0.4775 Qz^2$
(C) $\sigma_z = 0.4775 \frac{Q}{z^2}$
(D) $\sigma_z = 0.5775 Qz^2$

66. The volumetric strain per unit increase in effective stress of soil is defined as :

(A) Compression index
(B) Volume compressibility
(C) Coefficient of compressibility
(D) Consolidation

67. Failure of a finite slope along a surface that intersects the slope above the toe :

(A) Compound failure
(B) Base failure
(C) Slope failure
(D) Toe failure



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68. The height to diameter ratio of cylindrical specimen for uniaxial compression test of concrete is :

(A) 0.50 (B) 0.30
(C) 0.25 (D) 2.00

69. Which of the following is a measure of dynamic modulus of elasticity of concrete?

(A) Tangent modulus (B) Secant modulus
(C) Initial tangent modulus (D) All the above

70. The partial safety factor for strength of concrete for service ability limit state is :

(A) 1.00 (B) 1.10
(C) 1.15 (D) 1.25

71. When reinforcement bars placed short of their required length need to be extended, we use :

(A) anchorages (B) standard bends and hooks
(C) development length (D) splices

72. The ultimate moment of resistance by LSM for a beam with b = 300 mm, d = 550 mm, M20 concrete, reinforced with 4-25mm dia Fe250 bars :

(A) 146 kNm (B) 194 kNm
(C) 200 kNm (D) 210 kNm

73. Relation between Young's modulus and cube strength of concrete is :

(A) $E_c = 500\sqrt{f_{ck}}$ (B) $E_c = 5700\sqrt{f_{ck}}$
(C) $E_c = 5000\sqrt{f_{ck}}$ (D) $E_c = 700\sqrt{f_{ck}}$

74. The minimum area of tension reinforcement required in a rectangular beam section 200 mm × 400 mm if Fe415 steel is used at 25 mm effective cover :

(A) 154 $mm^2$ (B) 180 $mm^2$
(C) 164 $mm^2$ (D) 193 $mm^2$

75. Effective span of a simply supported beam is :

(A) Face to face distance of supports (B) Clear span + effective depth
(C) Clear span – effective depth (D) Clear span + effective depth /2

76. Minimum grade of concrete for pre tensioned pre-stressed concrete :

(A) M20 (B) M30
(C) M40 (D) M45



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77. Minimum reinforcement required in either direction in slabs reinforced with high strength deformed bars is :

(A) 0.11 (B) 0.12

(C) 0.15 (D) 0.17

78. Structural steel of grade Fe410 A has ultimate tensile strength of :

(A) 410 MPa (B) 328 MPa

(C) 300 MPa (D) 520 MPa

79. The diameter of bolt hole for a bolt of nominal size 12 mm is :

(A) 12.0 mm (B) 12.5 mm

(C) 13.0 mm (D) 14.0 mm

80. Common hot rolled steel axial compression members fail by :

(A) Gross section yielding (B) Critical section rupture

(C) Block shear (D) Flexural buckling

81. As per Indian Standards, the maximum bearing pressure at the column base should not exceed the bearing strength equal to :

(A) 0.40 $f_{ck}$ (B) 0.45 $f_{ck}$

(C) 0.50 $f_{ck}$ (D) 0.60 $f_{ck}$

82. A flat compression element of a cold formed steel section, stiffened at both edges parallel to the direction of stress is called :

(A) Stiffened compression element (B) Unstiffened compression element

(C) Multiple stiffened element (D) Flat element

83. Failure by block shear at an end connection of a plate involves :

(A) Shear along two planes, tension along two planes

(B) Shear along one planes, tension along two planes

(C) Shear along two planes, tension along one plane

(D) Shear along one plane, tension along one plane

84. Which of the following decides the width of taxiway?

(A) Tail width (B) Fuselage length

(C) Wheel base (D) Wing span of aircraft



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85. Elevator :

(A) Controls pitching of aircraft
(B) Controls yawing of aircraft
(C) Is fixed on the wing
(D) Controls rolling of aircraft

86. What is the super elevation required on a horizontal circular curve of radius 100m for a design speed of 50 km/h and coefficient of lateral friction 0.15?

(A) 0.017
(B) 0.027
(C) 0.047
(D) 0.157

87. Ruling gradient for mountainous terrain is :

(A) 4%
(B) 5%
(C) 6%
(D) 7%

88. The psychological widening required on a horizontal curve of radius 235 m for a design speed of 65 km/h is :

(A) 0.446 m
(B) 0.456 m
(C) 0.646 m
(D) 0.656 m

89. If the cross slope of a terrain is 20 %, according to IRC classification, it is a :

(A) Plain terrain
(B) Rolling terrain
(C) Mountainous terrain
(D) Steep terrain

90. The number of vehicles occupying a unit length of a lane of roadway at a given instant is :

(A) Traffic volume
(B) Traffic capacity
(C) Traffic density
(D) Basic capacity

91. Which of the following is a warning sign?

(A) One – way
(B) Speed limit
(C) Cycle crossing
(D) Parking

92. The gauge of a railway track is defined as :

(A) The clear distance between inner faces of two rails
(B) The clear distance between outer faces of two rails
(C) The centre to centre distance between two rails
(D) The distance between inner faces of a pair of wheels



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93. Equilibrium cant for a 3° curve on a Broad Gauge track, if the permitted speed is 70 kmph, is :

(A) 18.85 cm (B) 16.20 cm

(C) 15.85 cm (D) 11.25 cm

94. The gradient which determines the maximum load that the engine can haul on a section :

(A) Ruling gradient (B) Momentum gradient

(C) Pusher gradient (D) Super elevation

95. The difference between the latest allowable time and the earliest expected time is :

(A) Maximum float (B) Total float

(C) Slack time (D) Free float

96. Military organisation is :

(A) Line organisation (B) Line and staff organisation

(C) Functional organisation (D) None of these

97. 'The Garden City' principle for town planning was introduced by :

(A) Sir Ebenezer Howard (B) Sir Patrick Geddes

(C) Clarence Stein (D) Henry Wright

98. Which of the following is a natural growth of a town?

(A) Ribbon development (B) Satellite growth

(C) Scattered growth (D) All the above

99. Honey comb brick wall is measured in :

(A) Metres (B) Square metres

(C) Cubic metres (D) Number

100. The value of dismantled materials :

(A) Scrap value (B) Rateable value

(C) Salvage value (D) Market value



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