



# MPPSC AE

Civil Engineering

Mega Mock Test

(June 12th - June 13th 2022)

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Questions &  
Answer Key

1. The basic runways length should be increased at the rate of X percent per Y m rise in elevation above mean sea level, where
- A. X = 6; Y = 200  
B. X = 7; Y = 300  
C. X = 7; Y = 200  
D. X = 6; Y = 300

Ans. B

2. If the load Stresses are  $24 \text{ kg/cm}^2$ , warping stresses are  $30 \text{ kg/cm}^2$  and frictional stresses are  $25.5 \text{ kg/cm}^2$ , then what would be the value of critical stresses combination (in  $\text{kg/cm}^2$ ) at edge region during summer mid-day?
- A. 24  
B. 54  
C. 28.5  
D. 57

Ans. C

3. Due to slipping of the wheels the rail forms
- A. Crushed head  
B. Battered ends  
C. Spilt head  
D. Horizontal fissure

Ans. A

4. Quality circles in the construction industry can have the following participants:
- A. Engineers and architects  
B. Contractors and raw material suppliers  
C. Clients and consultants  
D. All of the above

Ans. D

5. Which of the following is a "Class-A" item in ABC analysis?
- A. Items with low cost but large in number  
B. Items with average cost but moderate in number  
C. Items with high cost but few in number  
D. Items with high cost but large in number

Ans. C

6. As per the Building Byelaws, how much should be the marginal distance that is to be left in the front?
- A. At least 3 m  
B. At least 5m  
C. More than 5m  
D. More than 10m

Ans. A

7. A propped cantilever is subjected to a concentrated load of 16 kN at the centre of the span. The length of beam is 4m. The flexural rigidity  $EI=4 \times 10^2 \text{ kNm}^2$ . The reactions at the fixed end and simply supported end are:
- A. 9.87 kN at fixed end and 6.13 kN at simply supported end  
B. 8 kN each at fixed end and simply supported end  
C. 11 kN at fixed end and 5 kN at simply supported end  
D. 16 kN at fixed end and zero kN at simply supported end

Ans. C

8. Which option matches List I (Pollutants) with List II (Sources) correctly from the given codes?

List-I	List-II
a. Fly ash	1. Mining
b. CO	2. Automobiles
c. SO <sub>2</sub>	3. Thermal power stations
d. Acid water	4. Volcanoes

A. a-1 b-2 c-3 d-4

B. a-3 b-2 c-4 d-1

C. a-3 b-4 c-2 d-1

D. a-2 b-1 c-4 d-3

Ans. C

9. The power channel that extends from the intake works to the power house is called:

A. Head race

B. Penstock

C. Diversion canal

D. None of these

Ans. A

10. Which option matches List I with List II correctly from the given codes?

List-I	List-II
a. The most common structure that carries pure compression is	1. a floor beam
b. A common structural form in which tension and compression elements are combined is	2. a pin jointed a column
c. A structure that carries tension compression and in-plane shear as member forces within itself is	3. an arch or a column
d. The transverse member that connects a pair of girders is	4. a surface structure

A. a-3 b-2 c-1 d-4

B. a-3 b-4 c-2 d-1

C. a-2 b-3 c-4 d-1

D. a-3 b-2 c-4 d-1

Ans. D

11. In a water sample  $\text{CO}_3^{2-}$  ions = 90 mg/l,  $\text{HCO}_3^-$  ions = 91.5 mg/l. What is alkalinity of water sample in mg/l as  $\text{CaCO}_3$ ?

A. 200

B. 50

C. 100

D. 225

Ans. D

12. The number of sleepers used for rails varies from, Where 'n' length of rail in 'm'

A. (n+1) to (n-4)

B. (n+3) to (n+6)

C. (n+2) to (n+7)

D. (n+4) to (n+7)

Ans. D

13. A large highway interchange fill was built over a 15m thick soil structure. The initial void ratio was 0.78. After 70% settlement, the void ratio was 0.69 would be the total anticipated settlement?
- A. 0.757 m  
B. 0.91 m  
C. 1.32 m  
D. 1.096m

Ans. D

14. The outside diameter of a 'hollow shaft is twice that of its inside diameter, and its torque carrying capacity is  $M_{t1}$ . A solid shaft of the same material has a diameter equal to the outside diameter of the hollow shaft, and its torque carrying capacity is  $M_{t2}$ . What will be the ratio of  $M_{t2}/M_{t1}$ ?
- A. 15/16  
B. 16/15  
C. 1/16  
D. 3/4

Ans. B

15. A steel plate of size 250mmx150mmx10mm with holes for two number of 16mm diameter bolts having ultimate strength of 410 MPa, the design strength of plate in rupture of critical section is
- A. 336 kN  
B. 382 kN  
C. 365 kN  
D. 280 kN

Ans. A

16. In compressed air tunneling, the amount of air required per minute per  $m^2$  of face area is
- A.  $1 m^3/min/m^2$   
B.  $6 m^3/min/m^2$   
C.  $10 m^3/min/m^2$   
D.  $20 m^3/min/m^2$

Ans. B

17. A 3.5 m wide slab is having thickness of 25 cm and friction factor ( $f$ ) is 1.5. The length of slab is 4.5 m and has unit weight of 2400 kg/m stress developed due to seasonal variation is \_\_\_\_\_  $N/mm^2$ .
- A. 0.06  
B. 0.08  
C. 0.05  
D. 0.07

Ans. B

18. Map cracking is the common type of failure in
- A. Rigid pavements  
B. Cement concrete pavements  
C. Gravel roads  
D. Bituminous surfacing

Ans. D

19. Which of the following test is used to determine the consistency and flow resistance of bitumen?
- A. Ductility test  
B. Viscosity test  
C. Softening point test  
D. Penetration test

Ans. B

20. A  $90 \text{ km}^2$  catchment has the 4-h unit hydrograph which can be approximated as a triangle. If the peak ordinate of this unit hydrograph is  $500 \text{ km}^2$ , then base width B is
- A. 120 h
  - B. 64 h
  - C. 50 h
  - D. none of these

Ans. C

21. Outriggers are used for
- A. crawler mounted mobile cranes to enhance its stability
  - B. wheel mounted mobile cranes to enhance its stability
  - C. fixing the lattice boom in a crane
  - D. fixing the telescopic boom in a crane

Ans. B

22. The reaction locus for a two hinged semicircular arch is
- A. a horizontal line parallel to the span
  - B. a parabolic curve
  - C. a cycloid
  - D. a elliptical curve

Ans. A

23. For the de-chlorination of water, the chemical added to water is
- A. Sodium sulphite
  - B. Alum
  - C. Hydrogen peroxide
  - D. Potassium permanganate

Ans. A

24. For nine number rain gauge stations with an error of 10% in the estimation of mean of the rainfall, the coefficient of variation of rainfall  $C_v$  obtained as:-
- A. 10
  - B. 20
  - C. 30
  - D. 40

Ans. C

25. The maximum average depth due to one day storm over an area of  $100 \text{ km}^2$  is 100 mm. Depth-Area-Duration (DAD) curves indicate that for the same area of  $100 \text{ km}^2$  the maximum average depth for a 3 hour storm will be
- A. 100 mm
  - B. More than 100 mm
  - C. Less than 100 mm
  - D. None of these are correct

Ans. C

26. Two beams carrying identical loads, simply supported, are having same depth but beam A has doubled the width as compared to beam B. The ratio of the strength of beam A to that of beam B is:
- A. 4
  - B. 1
  - C. 2
  - D. 6

Ans. C

27. If

$$\frac{d\theta}{dt} = \text{rate of angular deformation}$$

$$\frac{du}{dy} = \text{velocity gradient in transverse direction of flow}$$

$$\frac{du}{dx} = \text{velocity gradient in direction of flow}$$

$$\frac{dP}{dx} = \text{Pressure gradient in direction of flow}$$

Which of the below relation is correct for a fluid flow: -

A.  $\frac{d\theta}{dt} = \frac{du}{dy}$

B.  $\frac{d\theta}{dt} = \frac{du}{dx}$

C.  $\frac{d\theta}{dt} = \frac{dP}{dx}$

D. None

Ans. A

28. An old building has been purchased by a person at a cost of Rs. 30000 excluding the cost of the land. Calculate the amount of annual sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.

A. Rs. 555.25

B. Rs. 1028.37

C. Rs. 1500

D. Rs. 907.20

Ans. D

29. The canal aligned on the natural watershed line is called:

A. Side slope canal

B. Watershed canal

C. Contour canal

D. Free canal

Ans. B

30. The distance between C.G. of compression and C.G. of tension flanges of a plate girder is known as

A. Clear depth

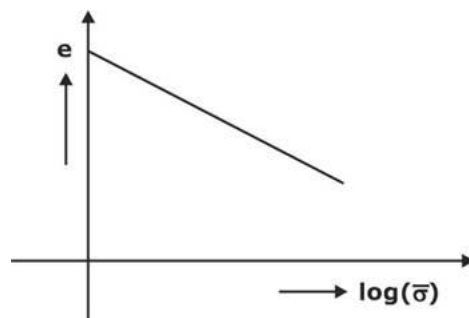
B. Overall depth

C. Effective depth

D. None of the above

Ans. C

31. The slope of following curve represents: -



Base e = void ratio  $\bar{\sigma}$  = effective stress

- A. Coefficient of compressibility  
 B. Coefficient of volume change  
 C. Coefficient of consolidation  
 D. Compression index.

Ans. D

32. In a river, the discharge was  $173 \text{ m}^3/\text{s}$ , the water surface slope was 1 in 6000 and the stage at the station X was 10.00 m. If during a flood station X was 10.00 and the water surface slope was  $1/2000$ , the flood discharge was approximately
- A.  $519 \text{ m}^3/\text{s}$   
 B.  $371 \text{ m}^3/\text{s}$   
 C.  $100 \text{ m}^3/\text{s}$   
 D.  $300 \text{ m}^3/\text{s}$

Ans. D

33. A conical tube of length 2m is fixed vertically with its smaller end upwards. The velocity of the flow at the smaller end is 5m/s while at the lower end it is 2m/s. The pressure head at the smaller end is 2.5m of liquid. The loss of head in the tube is  $\frac{0.35(V_1 - V_2)^2}{2g}$ . What will be the pressure head at the lower end if the flow occurs in the downward direction?
- A. 13.427m of fluid  
 B. 5.407 m of fluid  
 C. 18.337 m of fluid  
 D. 8.325 m of fluid

Ans. B

34. Particles having size less than  $0.2\mu$  can be analysed by:
- A. Sieve analysis  
 B. Sedimentation analysis  
 C. Electron microscope  
 D. Can-not be analysed as size is too less.

Ans. C

35. The coefficient of average rolling friction of a road is  $f_r$  and its grade is +G%. If the grade of this road is doubled, what will be the percentage change in the braking distance (for the design vehicle to come to a stop) measured along the horizontal (assume all other parameters are kept unchanged) ?
- A.  $0.01 G \times 100/(f_r + 0.02G)$   
 B.  $0.01 G \times 100/(f_r + 0.01G)$   
 C.  $2 f_r \times 100/(f_r + 0.01G)$   
 D. None of these

Ans. A

36. Determine the shear force F and moment M at section 5.0 m from the fixed end of cantilever beam having length 7.0 m carrying a point load 36 kN (3.0 m from the fixed end) along with udl of 4.0 kN/m throughout the length of 7.0 m.
- A.  $F = 8 \text{ kN}$ ,  $M = - 8 \text{ kN}$   
 B.  $F = 10 \text{ kN}$ ,  $M = - 10 \text{ kN}$   
 C.  $F = 10 \text{ kN}$ ,  $M = 8 \text{ kN}$   
 D.  $F = 8 \text{ kN}$ ,  $M = 10 \text{ kN}$

Ans. A

37. The projecting ornamental course at the junction of a wall and ceiling
- A. Coping  
 B. Corbel  
 C. Cornice  
 D. Parapet

Ans. C

38. A 6-hour unit hydrograph is having triangular shape with peak ordinate of  $30\text{m}^3/\text{sec}$  and base width of 64 hours. The equilibrium discharge obtained by using this 6-hour unit hydrograph is
- A.  $185\text{m}^3/\text{sec}$
  - B.  $175\text{m}^3/\text{sec}$
  - C.  $200\text{m}^3/\text{sec}$
  - D.  $160\text{m}^3/\text{sec}$

Ans. D

39. In which of the following solvents bitumen dissolves?

- 1) Carbon disulphide
- 2) Carbon tetrachloride
- 3) Benzene
- 4) Naphtha

- A. 2 and 3
- B. 1 and 4
- C. 3 and 4
- D. 1 and 2

Ans. D

40. A prismatic bar with rectangular cross-section  $20 \times 40\text{ mm}$ , length =  $2.8\text{ m}$  is subjected to axial tension force of  $70\text{ kN}$ . The measured elongation of bar is  $1.2\text{ mm}$ . What will be the strain ?

- A.  $428 \times 10^{-6}$
- B.  $400 \times 10^{-6}$
- C.  $450 \times 10^{-6}$
- D. None of these

Ans. A

41. As per the 'bandhara irrigation scheme', the discharge formula used for a bandhara weir is:

- A.  $1.7L H^{2.5}\text{Cumec}$
- B.  $1.7L H^{1.5}\text{Cumec}$
- C.  $2.7L H^{1.5}\text{Cumec}$
- D.  $1.7 H^{1.5}\text{Cumec}$

Ans. B

42. Irrigation water conveyed to the land by means of gravity flow indicates which of the following type of irrigation?

- A. Lift irrigation
- B. Drip irrigation
- C. Sprinkler irrigation
- D. Flow irrigation

Ans. D

43. A graph between the pressure head in the cylinder and the distance travelled by the piston from inner dead centre for one complete revolution of crank is known as

- A. Slip diagram
- B. Crank diagram
- C. Polar diagram
- D. Indicator diagram

Ans. D

44. Consider the following statements:

- A) Hydrofluorocarbons are organic compounds containing hydrogen, carbon and fluorine.
- B) They are commonly used as substitutes for ozone depleting substances like chlorofluorocarbons (CFCs) and are used in refrigerators and air-conditioners.



C) They also don't cause global warming.

Which of the above statements are correct? Select the code for the correct answer from the options given below:

- A. A and B only  
 B. B and C only  
 C. A and C only  
 D. A, B and C

Ans. A

45. Which of the following method is best suited for permeability at fine grained soil?

- A. Constant head method  
 B. Falling head method  
 C. Both are suitable  
 D. None of the above

Ans. B

46. Blue baby disease may be caused in infants due to drinking water containing higher concentrations of

- A. Nitrites  
 B. Nitrates  
 C. Lead  
 D. Arsenic

Ans. B

47. The main function of a diversion head works of a canal from a river is to

- A. Remove silt  
 B. Control floods  
 C. Store water  
 D. Raise water level

Ans. B

48. A vehicle weighs 50 kN when empty. Its minimum velocity for skidding on a curve is "v". If it is weighing 100 kN so that centroid remains at the same height when loaded, its minimum velocity for skidding on a curve is

- A. 0.5 v  
 B. 2.5 v  
 C. 1.5 v  
 D. v

Ans. A

49. The degree of static indeterminacy of the beam given below is



- A. zero  
 B. one  
 C. two  
 D. three

Ans. B

50. If within a zone of saturation, an impervious deposit below a pervious deposit is found to support a body of saturated material, then this body of saturated material is known as

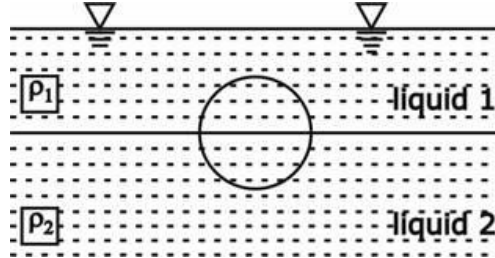
- A. Plowing well  
 B. Aquiclude  
 C. Artesian aquifer  
 D. Perched aquifer

Ans. D

51. The amount of fresh air required to maintain ventilation for workers inside the tunnel should be
- A. 1 – 5 m<sup>3</sup>/ minute  
B. 6 – 14 m<sup>3</sup>/minute  
C. 20 – 30 m<sup>3</sup>/ minute  
D. 30 – 50 m<sup>3</sup>/ minute

Ans. B

52. If volume of body in liquid –1 is  $v_1$  and liquid –2 is  $v_2$  the find the buoyant force on the given body?



- A.  $\rho_1 g v_1 + \rho_2 \cdot g v_2$   
B.  $\left(\frac{\rho_1 + \rho_2}{2}\right) g (v_1 + v_2)$   
C.  $\rho_1 g v_1 - \rho_2 \cdot g v_2$   
D.  $\left(\frac{\rho_1 + \rho_2}{2}\right) \cdot g (v_1 - v_2)$

Ans. A

53. For a discharge  $Q$ , the specific speed of the pump is  $N_s$ , For half discharge with the same head, the specific speed will be

- A.  $N_s$   
B.  $N_s \sqrt{2}$   
C.  $N_s / \sqrt{2}$   
D.  $2 N_s$

Ans. C

54. What is the concentration of H<sup>+</sup> ions in moles/L in water if the pOH value is 6.5?

- A.  $10^{-6.5}$   
B.  $10^{-7.5}$   
C.  $10^{-8.5}$   
D.  $10^{-9.5}$

Ans. B

55. In the model for a highway bridge constructed to a scale of 1:10, the force of water on the pier was measured as 10 N. What is the force (approx.) on the prototype pier ?

- A. 10 kN  
B. 100 kN  
C. 1000 kN  
D. 10000 kN

Ans. A

56. The minimum height of a typical mezzanine floor is \_\_\_\_\_ as per National Building of India.

- A. 3.5 m  
B. 0.8 m  
C. 1.5 m  
D. 2.2 m

Ans. D

57. Bed width (B) and depth (D) of economical section for a rectangular drains as per IRC guidelines on urban drainage shall be related as

A.  $B = D$

B.  $B = 1.5D$

C.  $B = 2D$

D.  $B = \frac{2D}{3}$

Ans. C

58. Match the List-I with List-II and select your correct answer using the codes given below:

**List-I ( Name of the associated with the methods)**

a. G.N. Maney

b. Hardy cross

c. Euler

d. Clapeyron

**List-II (Method)**

1) Moment distribution

2) Slope deflection method

3) Theorem of three moments

4) Crippling load on column

A. a-2 b-1 c-4 d-3

B. a-1 b-2 c-3 d-4

C. a-1 b-2 c-4 d-3

D. a-2 b-1 c-3 d-4

Ans. A

59. An identified source of irrigation water has ions concentration of  $\text{Na}^{++}$ ,  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  are 20, 10 and 8 milli-equivalent per litre respectively. Then what would be the Sodium Absorption Ration (SAR)?

A. 8

B. 6.67

C. 5.67

D. None of these

Ans. B

60. The bridge structure having a gross length of 6 m or less between the faces of the abatement or extreme vantage boundaries is known as

A. Causeway

B. Culvert

C. Short span bridge

D. None of the above

Ans. B

61. The width of carriageway for various classes of roads standardised by the Indian Road Congress (IRC) for two lanes without raised kerbs is

A. 3.75 m

B. 7.00 m

C. 7.50 m

D. 5.50 m

Ans. B

62. If a solid circular shaft is simultaneously subjected to a torque 'T' and a bending moment 'M', the ratio of maximum bending stress and maximum torsional shearing stress is given by

A.  $\frac{M}{T}$

B.  $\frac{T}{M}$

C.  $\frac{2M}{T}$

D.  $\frac{2T}{M}$

Ans. C

63. A direct runoff hydrograph due to isolated storm was triangular in shape with a base of 60 h and peak of 150 m<sup>3</sup>/s. If the catchment area is 1000 km<sup>2</sup>, the effective rainfall of the storm is

A. 1.62 cm

B. 0.021 cm

C. 0.21 cm

D. 21.0 cm

Ans. A

64. In prismatic compression member having length L, if one end is fixed and at other end translation is allowed but not rotation then the effective length will be:

A. 1.2 L

B. 0.8 L

C. 0.65 L

D. 1.0 L

Ans. A

65. At a certain station, the mean of the average temperature is 30°C and mean of the maximum daily temperature is 45°C. Calculate the airport reference temperature.

A. 25°C

B. 35°C

C. 45°C

D. None of the above

Ans. B

66. In ISLC 300 channels placed back to back at a spacing of 20 cm carry an axial load of 100 tonnes. The lacing system should be designed to resist a transverse shear of:

A. 2.5 tonnes

B. 4.0 tonnes

C. 10.0 tonnes

D. None of the

Ans. A

67. Cement used for railway sleepers is designated as

A. 40-S

B. 53-S

C. 46-S

D. 48-S

Ans. B

68. If D is the duration, ES and EF are the earliest start time and earliest finish time, LS and LF are the latest start time and latest finish time, then the following relation(s) hold(s) good:

A)  $EF = ES + D$

B)  $LS = LF - D$

C)  $D = EF - ES$

Select the code for the correct answer from the options given below:

- A. A and C only  
 B. A and B only  
 C. C only  
 D. A, B and C

Ans. D

69. In lakes eutrophication is mainly due to

- A. Reproduction of bacteria  
 B. Excessive inflow of nutrients  
 C. Increase in temperature  
 D. Variation of density

Ans. B

70. Which option matches List I with List II correctly from the given codes?

List-I	List-II
a. The most common structure that carries pure compression is	1. a floor beam
b. A common structural form in which tension and compression elements are combined is	2. a pin jointed a column
c. A structure that carries tension compression and in-plane shear as member forces within itself is	3. an arch or a column
d. The transverse member that connects a pair of girders is	4. a surface structure

- A. a-3 b-2 c-1 d-4  
 B. a-3 b-4 c-2 d-1  
 C. a-2 b-3 c-4 d-1  
 D. a-3 b-2 c-4 d-1

Ans. D

71. To ensure that no significant corrosion of particles of protected soil below the dam takes place

through the filter medium, the ratio of  $\frac{(D_{15})_{\text{filter}}}{(D_{85})_{\text{protected soil}}}$  shall be:-

- A. less than 5  
 B. Greater than 5  
 C. Less than 20  
 D. Greater than 20

Ans. A

72. The best method of estimating runoff is

- A. Unit Hydro graph  
 B. Runoff-Coefficient Method  
 C. Rational formula  
 D. Infiltration index method

Ans. A

73. According to the criteria recommended by IRC for Girder Bridges, the limiting load should not cause a deflection more than \_\_\_\_\_ of the span.

- A.  $\frac{1}{1000}$   
 B.  $\frac{1}{1200}$   
 C.  $\frac{1}{1500}$   
 D.  $\frac{1}{2000}$

Ans. C

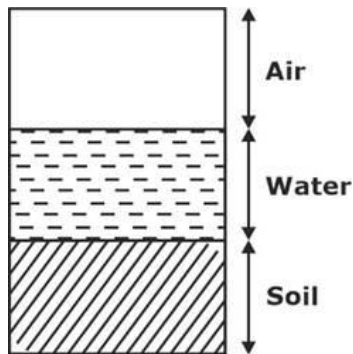
74. There are three parallel paths in a part of a network between a bursting node and the next merging node with only one activity in each path. The minimum number of dummy arrows needed will be
- A. Zero  
B. 1  
C. 2  
D. 3

Ans. C

75. Equilibrium cant for a  $3^\circ$  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

Ans. D

76. For a given 3-phase system, calculate degree of saturation



$$V_{\text{Air}} = 0.1 \text{ m}^3$$

$$V_{\text{Water}} = 0.3 \text{ m}^3$$

$$V_{\text{Solid}} = 0.6 \text{ m}^3$$

- A. 75%  
B. 50%  
C. 30%  
D. 45%
77. Cavity or hollow space in a wall is provided for:
- 1) Prevention of dampness
  - 2) Heat insulation
  - 3) Sound insulation
  - 4) Efflorescence
- A. 1 and 2  
B. 1 and 3  
C. 1,2 and 4  
D. 1,2,3 and 4

Ans. D

78. The limiting value of cant gradient for all gauges
- A. 1 in 360  
B. 1 in 720  
C. 1 in 1000  
D. 1 in 1200

Ans. C

79. The system of organization introduced by F.W. Taylor is known as
- A. Effective organization
  - B. Functional organization
  - C. Lien and staff organization
  - D. Lien organization

Ans. B

80. If the moisture content of sludge is reduced from 99% to 95%, the volume of sludge will decreased by:
- A. 80%
  - B. 50%
  - C. 60%
  - D. 100%

Ans. A

81. If water content is expressed in terms of total weight of soil mass than which at the following is correct?
- A.  $w' > 0$
  - B.  $w' \geq 0$
  - C.  $0 \leq w' < 100$
  - D.  $0 \leq w' \leq 100$

Ans. B

82. One liter of sewage, when allowed to settle for 30 minutes gives a sludge volume of 27 cm<sup>3</sup>. If the dry weight of this sludge is 3.0 grams, then its sludge volume index will be
- A. 9
  - B. 24
  - C. 30
  - D. 81

Ans. A

83. The optimistic, the most likely duration and the pessimistic time estimates in a network are 4,5 and 8 months respectively. The expected time is :
- A. 4.00 months
  - B. 5.33 months
  - C. 5.67 months
  - D. 7.00 months

Ans. B

84. 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

Ans. A

85. Which system help the engine driver to observe visual signals and in case of his failure to do so, to reduce automatically speed and bring the train to stop?
- A. Absolute block
  - B. A .T.C
  - C. One Engine only
  - D. Pilot guard

Ans. B

86. Which of the following condition must be satisfied in the Hardy-Cross analysis of pipe network?
- A. Darcy-Weisbach head loss equation.
  - B. Momentum equation must be satisfied so that the force in each loop is balanced.
  - C. Continuity principle demands that flow into a network junction is equal to the flow out of it.
  - D. Both (A) and (C)

Ans. D

87. A portion of an embankment having a uniform up-gradient 1 in 500 is circular with radius 1000 m of the centre line. It subtends  $180^\circ$  at the centre. If the height of the bank is 1 m at the lower end, and side slopes 2:1, the earth work involved is \_\_\_\_\_x1000 m<sup>3</sup>.
- A. 24.5
  - B. 25.5
  - C. 26.5
  - D. 27.5

Ans. D

88. A standard oedometer test in the laboratory indicated that a 0.02 m thick clay specimen took 1.0 day to undergo 90% consolidation. How many days a 2.0 m thick identical clay sample sandwiched between sand layers and subjected to an identical stress increment take to undergo the same?
- A. 500 days
  - B. 5000 days
  - C. 1000 days
  - D. 10000 dais

Ans. D

89. Purposes of rate analysis are:

- (i) To determine the current rate per unit of an item at the locality.
- (ii) To examine the viability of rated offered by contractors.
- (iii) To calculate the quantity of materials and labour strength required for project planning
- (iv) To fix labour contract rates

- A. (i), (ii) and (iv)
- B. (ii), (iii) and (iv)
- C. (i), (ii) and (iii)
- D. (i), (ii), (iii) and (iv)

Ans. D

90. The consumptive use of water for a crop
- A. Is measured as the volume of water per unit area
  - B. Is measured as depth of water on irrigated area
  - C. May be supplied partly by precipitation and partly by irrigation
  - D. All of the above

Ans. D

91. The Euler's crippling load for a 2m long slender steel rod of uniform cross-section hinged at both the ends is 1 kN. The Euler's crippling load for aim long steel rod of the same corss-section and fixed at both the ends will be
- A. 0.25kN
  - B. 0.5 kN
  - C. 2 kN
  - D. 4 kN

Ans. D



92. When a cohesion less soil attains quick condition, it losses
- A. Shear strength
  - B. Bearing strength
  - C. Normal strength
  - D. All of the above

Ans. A

93. A road is being designed for a speed of 110 km/hr on a horizontal curve with a superelevation of 8%. If the coefficient of side friction is 0.10, the minimum radius of the curve (in m) required for safe vehicular movement is
- A. 115.0
  - B. 152.3
  - C. 264.3
  - D. 528.5

Ans. D

94. A wastewater sample has  $k_1 = 0.2 \text{ day}^{-1}$  and an ultimate BOD (L) = 200 mg/L.

What is the final dissolved oxygen at five days in a BOD bottle in which the Sample is diluted 1: 20 and where the initial DO is 10.2 mg/L?

- A. 0.60 mg/l
- B. 1.20 mg/l
- C. 1.80 mg/l
- D. 2.40 mg/l

Ans. B

95. The slenderness ratio of a vertical column of square cross-section of 2.5 cm sides and 300 cm effective length, is
- A. 200
  - B. 360
  - C. 240
  - D. 416

Ans. D

96. Which of the following is correct unit for intrinsic permeability or absolute permeability?
- A.  $\text{m}^2$
  - B.  $\text{m}^2/\text{sec}$
  - C. m
  - D. m/sec.

Ans. A

97. A soil sample,  $20 \text{ cm}^3$  in cross-sectional area and 10 cm long is tested for permeability in a variable head permeameter. The stand pipe has a cross-sectional area of  $1 \text{ cm}^2$  and the head drops from 30 cm to 10 cm in 6 minute and 20 seconds. The soil permeability will be :
- A.  $1.44 \times 10^{-3} \text{ cm/sec}$
  - B.  $2.44 \times 10^{-3} \text{ cm/sec}$
  - C.  $2.44 \times 10^{-4} \text{ cm/sec}$
  - D.  $1.44 \times 10^{-4} \text{ cm/sec}$

Ans. A

98. Match List-I (Type of curve) with List-II (Flow condition) and select the correct answer using the codes given below the lists:

List-I

- a. A<sub>2</sub>
- b. H<sub>3</sub>
- c. M<sub>1</sub>
- d. S<sub>2</sub>

List-II

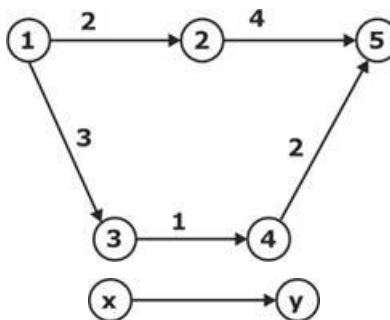
- 1. Hydraulic drop occurs
- 2. Back water profile
- 3. Slope upward in direction of flow
- 4. Hydraulic jump occurs

Code:

- A. a-4 b-1 c-2 d-3
- B. a-2 b-3 c-4 d-1
- C. a-4 b-3 c-2 d-1
- D. a-3 b-4 c-2 d-1

Ans. D

99. For a network diagram shown below



If both x, y has even or odd number, then probability factor will be 84.13% else 15.87%.

$\sigma = 8$  for  $1 \rightarrow 2$  and  $2 \rightarrow 5$

$\sigma = 7$  for  $1 \rightarrow 3, 3 \rightarrow 4, 4 \rightarrow 5$

What is the critical path?

- A.  $1 \rightarrow 2 \rightarrow 5$
- B.  $1 \rightarrow 3 \rightarrow 4 \rightarrow 5$
- C. Both A and B
- D. Can't say

Ans. A

100. Choose the correct options.

- 1) All activities require time and resources
- 2) Two activities can be done parallelly or one after another.
- 3) Every event in a network diagram serves dual role

- A. 1, 2
- B. 1,2,3
- C. 1, 3
- D. None of these

Ans. D

101. Which of the following festival is organized in Ujjain by the Madhya Pradesh Government?
- A. Bhoj Festival  
B. Padmakar Festival  
C. Kalidas Festival  
D. None of the above

Ans. C

102. In which district of Madhya Pradesh 'Mangalnath temple' located?
- A. Omkareshwar  
B. Gwalior  
C. Ujjain  
D. Panna

Ans. C

103. The famous Gotmar fair is held in which district?
- A. Rewa  
B. Vidisha  
C. Chhindwara  
D. Sehore

Ans. C

104. Match the List-I (Archaeological site) with list-II (District) and select the correct answer using the code given below of the list:

List- I (Archaeological Site)	List-II (District)
A. Nagda	1. Sagar
B. Eran	2. Ujjain
C. Peetnagar	3. Dhar
D. Khalghat	4. Khargon

Codes:

- A. a-2 b-1 c-4 d-3  
B. a-3 b-4 c-2 d-1  
C. a-4 b-3 c-2 d-1  
D. a-1 b-2 c-3 d-4

Ans. A

105. What was the capital of the southern part of Avanti Mahajanapada?
- A. Omkareshwar  
B. Ujjain  
C. Mahishmati  
D. Orchha

Ans. C

106. Thakur Daulat Singh, who fought against the Britishers in the Revolt of 1857, was associated with which one of the following district of Madhya Pradesh?
- A. Dewas  
B. Mandala  
C. Jabalpur  
D. Mandsaur

Ans. A

107. The Kandariya Mahadev Temple located at Khajuraho was built by which of the following?
- A. Vidyadhara  
B. Dhangdev  
C. Ashoka  
D. Vijayapala

Ans. A

108. Directorate of Archeology, Archives and Museum has preserved the legacy of the medieval oldest mass structure known as Khooni Bhandara. In which district of Madhya Pradesh is this heritage located?

- A. Mandla
- B. Burhanpur
- C. Khandwa
- D. Hoshangabad

Ans. B

109. Which one of the following popular dance forms is performed by the Bheria tribe?

- A. Karma
- B. Saitam
- C. Pardhauni
- D. All of the above

Ans. B

110. The Buddhist era Mada Caves are located in which district of Madhya Pradesh?

- A. Burhanpur
- B. Khandwa
- C. Singrauli
- D. Dhar

Ans. C

111. Which tehsil of Kota district of Rajasthan was merged with Madhya Pradesh on 1 November 1956?

- A. Sironj
- B. Dhabra
- C. Ramganj Mandi
- D. Baura

Ans. A

112. Which plateau lies between Aravali and Vindhya ranges?

- A. Peninsular Plateau
- B. Deccan plateau
- C. Chota Nagpur Plateau
- D. Malwa plateau

Ans. D

113. Which of the following city of Madhya Pradesh is not located on the North-South Corridor?

- A. Shivpuri
- B. Gwalior
- C. Seoni
- D. Sagar

Ans. A

114. Name the three major districts, which is nearest to the tropic of cancer passing through Madhya Pradesh.

- A. Betul, Vidisha, Mandla
- B. Ujjain, Ratlam, Rajgarh
- C. Sagar, Chhattarpur, Rewa
- D. Gwalior, Jabalpur, Bhopal

Ans. B

115. Which of the following rivers is a tributary of Tapti?

- A. Tawa
- B. Barna
- C. Purna
- D. Barner

Ans. C

116. Where is Sandipani Ashram located?

- A. Indore
- B. Ujjain
- C. Omkareshwar
- D. Jabalpur

Ans. B

117. What is the name of the highest peak in the Satpura ranges?

- A. Parasnath
- B. Mahendra Giri
- C. Dhupgarh
- D. Guru Shikhar

Ans. C

118. In which Indian state the 'Lonar lake' is located?

- A. Gujarat
- B. Madhya Pradesh
- C. Maharashtra
- D. Arunachal Pradesh

Ans. C

119. Through which district of Madhya Pradesh the Indian Standard Time (IST) line passes?

- A. Shahdol
- B. Umaria
- C. Singrauli
- D. Jabalpur

Ans. C

120. Madhya Pradesh receives rainfall from:

- A. Arabian Sea
- B. Bay of Bengal
- C. Both
- D. None of the above

Ans. C

121. According to the India Forest Status Report 2019, which state has the highest forest cover?

- A. Arunachal Pradesh
- B. Madhya Pradesh
- C. Chhattisgarh
- D. Odisha

Ans. B

122. Bori Wildlife Sanctuary is located in which district of Madhya Pradesh?

- A. Hoshangabad
- B. Chhatarpur
- C. Dewas
- D. Ratlam

Ans. A

123. 'Ghatigaon Sanctuary' is located in which district of Madhya Pradesh?

- A. Alirajpur
- B. Raisen
- C. Jabalpur
- D. Gwalior

Ans. D

124. Which of the following national parks is not located in Madhya Pradesh?

- A. Madhav National Park
- B. Sanjay National Park
- C. Bandipur National Park
- D. Bandhavgarh National Park

Ans. C

125. Which of the following places is included in the Ramsar list in Madhya Pradesh?

- A. Bhitarkanika Mangrove
- B. Chandratat wetland
- C. Renuka Wetland
- D. Bhoj wetland

Ans. D

126. According to census 2011, what is the percentage of male and female literacy in Madhya Pradesh, respectively?

- A. 64.9, 56.7
- B. 78.7, 59.2
- C. 74.1, 63.5
- D. 70.8, 64.2

Ans. B

127. Which of the following pairs is not correctly matched?

- A. District with highest rural population in Madhya Pradesh – Rewa
- B. District with highest urban population in Madhya Pradesh - Indore
- C. Madhya Pradesh's least populous district – Niwari
- D. Madhya Pradesh's most populous district - Jabalpur

Ans. D

128. According to Census 2011, what was the decadal population growth rate of Madhya Pradesh?

- A. 17.70
- B. 19.3
- C. 20.3%
- D. 21.6%

Ans. C

129. According to census 2011, which is the most literate district in Madhya Pradesh?

- A. Jabalpur
- B. Indore
- C. Bhopal
- D. Gwalior

Ans. A

130. What was the total population of Madhya Pradesh as per Census 2011?

- A. 7,36,26,809
- B. 7,27,26,809
- C. 7,26,26,809
- D. 7,26,36,809

Ans. C

131. Kolar project is located in which district of Madhya Pradesh?

- A. Sehore
- B. Mandla
- C. Dhar
- D. Raisen

Ans. A

132. What is the tenure of the chairperson and members of the Madhya Pradesh Public Service Commission (MPPSC)?

- A. 3 years
- B. 4 years
- C. 5 years
- D. 6 years

Ans. D

133. On ....., the Madhya Pradesh government issued a notification on the recommendation of the Planning Commission of the Government of India and formed the "Planning Board".
- A. 16 January 1969  
B. 24 October 1972  
C. 5 September 1975  
D. 21 December 1978

Ans. B

134. Where is the bench of Madhya Pradesh High Court located?
- A. Bhopal  
B. Ujjain  
C. Gwalior  
D. Rewa

Ans. C

135. Who among the following has not been the Governor of Madhya Pradesh?
- A. Balram Jakhar  
B. Anandiben Patel  
C. Ram Naresh Yadav  
D. Kalyan Singh

Ans. D

136. When was the Madhya Pradesh Panchayati Raj Act 1993 implemented?
- A. Year 1993  
B. Year 1994  
C. Year 1995  
D. Year 1996

Ans. B

137. After the first Chief Minister of Madhya Pradesh Shri Ravi Shankar Shukla, who became the Chief Minister of the state?
- A. Kailash Nath Katju  
B. Bhagwantrao Mandloi  
C. Dwarka Prasad Mishra  
D. Govind Narayan Singh

Ans. B

138. The President's rule was imposed in Madhya Pradesh for the first time on:
- A. 15 August 1961  
B. 29 April 1977  
C. 25 June 1974  
D. 5 November 1983

Ans. B

139. Which of the following is the work of Madhya Pradesh Planning Board?
- A. Setting the priorities of the state plan  
B. Assist in the preparation of useful development plans at the district level  
C. Making necessary amendments in the state's economic and social development policy  
D. All of the above

Ans. D

140. From which year did the 'Vijayaraje Janani Kalyan Bima Yojana' of the Government of Madhya Pradesh started?
- A. 2006  
B. 2008  
C. 2009  
D. 2010

Ans. A

141. According to the official data released by the National Tiger Conservation Authority (NTCA) recently, at which place Madhya Pradesh ranked in the case of tiger accident?

- A. First
- B. Second
- C. Third
- D. Fourth

Ans. A

142. Which state has started the 'Dr. Khubchand Baghel Health Assistance Scheme'?

- A. Madhya Pradesh
- B. Jharkhand
- C. Gujarat
- D. Chhattisgarh

Ans. D

143. The first mobile bank in the country is functioning in rural areas in which district of Madhya Pradesh?

- A. Bhopal
- B. Khargone
- C. Raisen
- D. Vidisha

Ans. B

144. Security Paper Mill was established at Hoshangabad in which year?

- A. 1965
- B. 1968
- C. 1969
- D. 1971

Ans. B

145. Where is the headquarters of "Madhya Pradesh Finance Corporation"?

- A. Bhopal
- B. Jabalpur
- C. Indore
- D. Ujjain

Ans. C

146. Madhya Pradesh Rajya Van Vikas Nigam Ltd. started in which year?

- A. 1961
- B. 1975
- C. 1967
- D. 1992

Ans. B

147. Which city of Madhya Pradesh has been declared as the first 'Water Plus' certified city of India under the Swachh Survekshan 2021?

- A. Katni
- B. Indore
- C. Orcha
- D. Gwalior

Ans. B

148. Which state has become the India's first fully organic state?

- A. Tripura
- B. Sikkim
- C. Himachal Pradesh
- D. Haryana

Ans. B



149. Which State has become the first rabies-free State in the country?

A. Goa

B. Rajasthan

C. Uttar Pradesh

D. Madhya Pradesh

Ans. A

150. PM Narendra Modi launched 'Light House Project' in 6 States. Which of the following is not among those 6 states?

A. Lucknow (Uttar Pradesh)

B. Indore (Madhya Pradesh)

C. Rajkot (Gujarat)

D. Mumbai (Maharashtra)

Ans. D

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