



# PPSC JE

## Civil Engineering

### Mega Mock Test

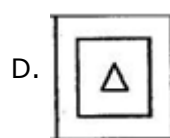
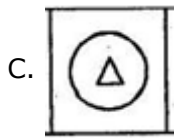
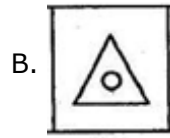
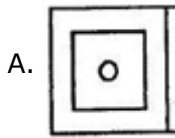
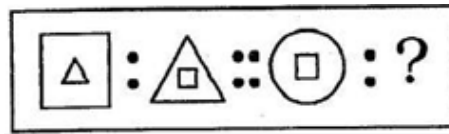
(March 04th - March 05th 2022)

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## Questions & Answer Key

1. Select the related figure from the given alternatives.

**Question Figures:**



Ans. A

2. Select the mirror image of the given figure when the mirror is placed to the right of the figure.

**SECRETARY**

A.

B.

C.

D.

Ans. D

3. **Direction:** First 8 numbers, 1 to 8, are written from top to bottom. The letters of word 'Dear' are written in alphabetical order against each odd number. There are 2 letters between N and R. There are 3 letter between G and I. G is above I. K is written against number 8. (No letter is repeated against any number).

How many alphabets in English alphabetical series are there between the alphabets written against numbers 5 and 6?

A. 0

B. 1

C. 2

D. 3

Ans. D

4. **Direction:** In question below are given three or four statements followed by two or three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements, disregarding commonly known facts.

**Statements:**

Some pens are stars.

All stars are snow.

No star is a moon.

Some moon are ears.

**Conclusion:**

I. Some snow are moon.

II. At least some moon being snow is a possibility.

III. Some pen can never be ear, is a possibility.

A. All follow

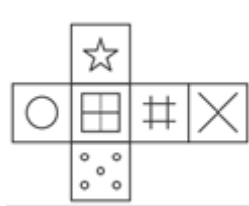
B. Only I not follow

C. Only II and III not follows

D. Either I or II and III follow

Ans. B

5. Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?



Ans. B

6. If in the word 'BANQUET', all the vowels are changed to the next letter and all the consonants are changed to the previous letter. Which of the following letters is fourth from the right end?

A. P

B. A

C. F

D. B

Ans. A

7. Pointing to a woman, Nirmal said, "She is the only daughter of my wife's grandfather's only child". How is the woman related to Nirmal?

A. Wife

B. Sister-in-law

C. Sister

D. Data inadequate

Ans. A

8. A girl was 5 km away from her house towards North-West direction. A DOG was 3 km away towards North from the GIRL's house. Then she moved 3 km towards South and started standing towards west of the house. Again, the girl moved another 3km towards south and started facing towards her house and the DOG came back to the house. What is the final distance between the DOG & the GIRL and in which direction GIRL facing finally?

A. 5 km and North-East

B. 6 km and North

C. 10 km and East

D. None of these b

Ans. A



16. Who has authored the book titled 'Human Rights and Terrorism in India'?

- A. Subramanian Swamy
- B. Subhashini Haider
- C. M Venkaiah Naidu
- D. Arun Kumar Mishra

Ans. A

17. Which power generating company has signed a Promoters Agreement with the Green Energy Development Corporation of Odisha (GEDCOL) for the development of 500 megawatts (MW) floating solar projects on different water bodies in the state?

- A. NTPC Ltd
- B. NHPC Ltd
- C. Tata Power
- D. Adani Power

Ans. B

18. 24th conference on e-Governance (NceG) was held in which city of India?

- A. Bengaluru
- B. Indore
- C. New Delhi
- D. Hyderabad

Ans. D

19. Panna national park is located in which state?

- A. Karnataka
- B. Uttar Pradesh
- C. Madhya Pradesh
- D. Jharkhand

Ans. C

20. What is the theme of the World Day for Audiovisual Heritage 2019?

- A. Protect and Share Your Visual Story
- B. Engage the Past Through Sound and Image
- C. It's Your Story – Don't lose it
- D. Discover, Remember and Share

Ans. B

21. The body is sometimes acted by two or three force members and we need to find the moment of inertia for the same. The difference between the two and the three force members is:

- A. The former is collinear and the latter is parallel
- B. The former is parallel and the latter is perpendicular
- C. The former is perpendicular and the latter is collinear
- D. The former is acting on two points in the body while the latter is on three points

Ans. D

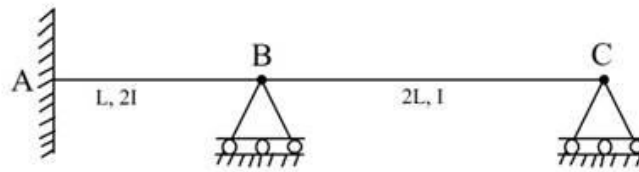
22. When the strain in a material increases with time under sustained constant stress, the phenomenon is known as:

- A. Strain hardening
- B. Hysteresis
- C. Creep
- D. Visco-elasticity

Ans. C



28. The slope deflection equation for part BC of the beam, shown below, is



A.  $M_{BC} = M_{FBC} + \frac{2EI}{L} (2\theta_B + \theta_C)$

B.  $M_{BC} = M_{FBC} + \frac{EI}{L} (2\theta_B + \theta_C)$

C.  $M_{BC} = M_{FBC} + \frac{2EI}{L} (2\theta_C + \theta_B) + \frac{1}{2} M_{FBA}$

D.  $M_{BC} = M_{FBC} + \frac{EI}{L} (2\theta_C + \theta_B) + \frac{1}{2} M_{FBA}$

Ans. B

29. As the span of a bridge increases, the impact factor \_\_\_\_\_.

- A. decreases
- B. increases
- C. remains constant
- D. increases up to a critical value of span and then decreases

Ans. A

30. A riveted joint may experience

- A. shear failure
- B. Shear failure of plates
- C. bearing failure
- D. All option are correct

Ans. D

31. The slenderness ratio of lacing bars should not exceed

- A. 100
- B. 120
- C. 180
- D. 145

Ans. D

32. The maximum allowable percentage of compression reinforcement of RC beam is

- A. 0.87  $f_y$
- B. 0.45  $f_y$
- C. 4%
- D. 2%

Ans. C

33. The magnetic bearing of a line (AB) is  $110^{\circ}45'$ . If magnetic declination is  $10^{\circ}05'E$ , then what is the true bearing of the line AB?

- A.  $115^{\circ}$
- B.  $118^{\circ}45'$
- C.  $120^{\circ}50'$
- D.  $122^{\circ}55'$

Ans. C





41. Calculate the whole circle bearing of a line, if its reduced bearing is N 30° W
- A. 30°                      B. 330°  
C. N 30° W                D. S 60° W

Ans. B

42. In a closed traverse \_\_\_\_\_.
- A. difference between fore-bearing and back-bearing should be  $90^\circ$
  - B. sum of included angles should be  $(2N-4)$  times right angle, where N represents the number of sides
  - C. sum of included angles should be  $(2N-1)$  times right angle, where N is the number of sides
  - D. None of these

Ans. B

43. Invar tapes are made of an alloy of \_\_\_\_\_.
- A. Nickle and steel                      B. Copper and steel
- C. Tin and steel                          D. Aluminium and steel

Ans. A

44. For a satisfactory workable concrete with a constant W.C. ratio increase in aggregate cement ratio
- A. Increases the strength of concrete                      B. Decreases the strength of concrete
- C. No effect on the strength of concrete                      D. None of these

Ans. B

45. The standard size of brick as per Indian standards is \_\_\_\_\_.
- A. 20 cm x 10 cm x 10 cm                      B. 23 cm x 12 cm x 8 cm
- C. 19 cm x 9 cm x 9 cm                         D. 18 cm x 9 cm x 9 cm

Ans. C

46. Proper proportioning of concrete, ensures\_\_\_\_\_.
- A. desired strength and workability                      B. desired durability
- C. water tightness of the structure                      D. All options are correct

Ans. D

47. While compacting the concrete by a mechanical vibrator, the slump should not exceed \_\_\_\_\_ cm.
- A. 2.5                      B. 5.0
- C. 7.5                      D. 10

Ans. B

48. As per IS 456 : 2000, for sea water, grade of concrete lesser than which of the following shall not be used in reinforced concrete:
- A. M20                                      B. M30  
C. M35                                      D. M40

Ans. B

49. The specific gravity of asbestos is

- A. 2.65
- B. 286
- C. 3.10
- D. 3.50

Ans. C

50. Fly ash is obtained from

- A. The distillation of petroleum
- B. The burning of coal
- C. The combustion of iron
- D. None of the above

Ans. B

51. Fly ash can be utilised in manufacturing of

- A. Cellular concrete blocks
- B. Bricks
- C. Concrete
- D. All of the above

Ans. D

52. Pozzolana react with \_\_\_\_\_ in the presence of water to form cementitious material?

- A.  $\text{CaCl}_2$
- B.  $\text{CaCO}_3$
- C.  $\text{Ca}(\text{OH})_2$
- D.  $\text{Mg}(\text{OH})_2$

Ans. C

53. Le Chatelier's device is used for determining the:

- A. Setting time of cement
- B. Soundness of cement
- C. Tensile strength of cement
- D. Compressive strength of cement

Ans. B

54. What is the water-cement ratio (w/c) required to complete the reactions in hydration of cement?

- A. 0.15 to 2.0
- B. 0.20 to 0.30
- C. 0.35 to 0.45
- D. 0.50 to 0.65

Ans. C

55. What is the temperature range in the cement kiln?

- A. 800 to 1050°C
- B. 1050 to 1300°C
- C. 1300 to 1500°C
- D. 1800 to 2100°C

Ans. C

56. In PERT analysis the probability distribution followed by the activity and the project is

- A. Gaussian and  $\beta$ -distribution respectively
- B. Normal and exponential distribution respectively
- C.  $\beta$ -distribution and gaussian distribution respectively
- D. exponential and normal distribution respectively

Ans. C

57. When actual cost of construction plus certain profit is paid to the contractor then such a contract is known as \_\_\_\_\_.

- A. Unscheduled contract
- B. Nominated contract
- C. Cost plus percentage contract
- D. Work order

Ans. C

58. Which of the following Tax generally not applicable to residential building is?

- A. Sales tax
- B. Property tax
- C. Wealth tax
- D. Municipal tax

Ans. A

59. What is the approximate cost of the complete labour as a percentage of the total cost of the building?

- A. 0.1
- B. 0.25
- C. 0.4
- D. 0.05

Ans. B

60. The quantity cement concrete damp-proofing course is measured in terms of \_\_\_\_\_.

- A. m
- B.  $m^2$
- C.  $m^3$
- D. lump sum

Ans. B

61. Sensitivity analysis is a study of

- A. Comparison of profit and loss
- B. Comparison of assets and liabilities
- C. Changes in output due to change in input
- D. Economics of costs and benefits of the project

Ans. C

62. For estimation of the brick masonry, no deduction is made for the end of the rafter up to the area (square inch) of

- A. 50
- B. 72
- C. 108
- D. 44

Ans. B

63. Which of the following is a factor for obsolescence of the property?

- A. New invention
- B. Improvement in design
- C. Outdated design and structure
- D. All option are correct

Ans. D

64. Given for a sample of river sand:

Void ratio at the densest state = 0.35

Void ratio at loosest stage = 1.1

Which one of the following correctly represents the relative density of the sample prepared with a void ratio of 1.0?

- A. 12.5%
- B. 25%
- C. 75%
- D. 13.33%

Ans. D

65. Pick up the correct statement from the following

- A. Sand obtained from pits, is washed to remove clay and silt
- B. Sand obtained from flooded pits, need not be washed before use
- C. Sea shore sand contains chlorides which cause efflorescence
- D. All option are correct

Ans. D

66. A loose uniform sand with rounded grains has effective grain size of 0.05 cm. Co-efficient of permeability of the sand is \_\_\_\_\_.

- A. 0.25 cm/sec
- B. 0.5 cm/sec
- C. 1 cm/sec
- D. 1.25 cm/sec

Ans. A

67. The lime stabilization is very effective in treating

- A. Sandy soils
- B. Silty soils
- C. Non-plastic soils
- D. Plastic clayey soils

Ans. D

68. Which of the following soils has the uniformity coefficient of more than 10?

- A. Well graded soil
- B. Coarse soil
- C. Uniform soil
- D. Poor soil

Ans. A

69. A soil has a bulk density of 22 kN/m<sup>3</sup> and water content 10%. The dry density of soil in kN/m<sup>3</sup> is

- A. 18.6
- B. 20.0
- C. 22.0
- D. 23.2

Ans. B

70. Which one of the following is the best method for the stabilization of the clayey subgrade in water logged area?

- A. Cement stabilization
- B. Lime stabilization
- C. Bitumen stabilization
- D. Stabilization by grouting

Ans. B

71. Given that for a sample

Critical void ratio = 0.50

Initial void ratio = 0.60

If the sand sample is subjected to continued shear, its volume will:

- A. Increase
- B. Decrease
- C. Not change
- D. Initially increase and then decrease

Ans. B

72. Given for a soil stratum:

Coefficient of permeability in horizontal direction = 3 m/day

Coefficient of permeability in vertical direction = 1/3 m/day

The effective permeability of the stratum is

- A. 0.6 m/day
- B. 1.0 m/day
- C. 1.33 m/day
- D. 1.66 m/day

Ans. B

73. In a three-layered soil, water flows parallel to stratification. The thickness of the middle layer is twice that of top and bottom layer. The coefficient of permeability of middle layer ( $2k$ ) is twice that of top and bottom layer ( $k$ ). What is the average coefficient of permeability for this flow?

- A.  $k$
- B.  $1.33 k$
- C.  $1.5 k$
- D.  $0.66 k$

Ans. C

74. A clear dry sand sample is tested in a direct shear test. The normal stress and the shear stress at failure are both equal to  $120 \text{ kN/m}^2$ . The angle of shearing resistance of the sand will be:

- A.  $25^\circ$
- B.  $35^\circ$
- C.  $45^\circ$
- D.  $55^\circ$

Ans. C

75. In extended aeration process, the system works in which phase?

- A. stationary
- B. endogeneous
- C. log phase
- D. all of these

Ans. B

76. Anaerobic treatment is best suited for \_\_\_\_\_.

- A. High efficiency
- B. Toxic wastes
- C. Dilute inorganic wastes
- D. Strong organic wastes

Ans. D

77. What is the maximum permissible limit of fluoride in drinking water?

- A.  $1.2 \text{ mg/l}$
- B.  $1.5 \text{ mg/l}$
- C.  $3 \text{ mg/l}$
- D.  $0.5 \text{ mg/l}$

Ans. B

78. For a design of a storm sewer in a drainage area, if the time of concentration is 20 minutes, then the duration of rainfall is taken as:

- A. 10 min
- B. 20 min
- C. 30 min
- D. 40 min

Ans. B

79. For a water sample the total hardness is  $200 \text{ mg/l}$  as  $\text{CaCO}_3$  and alkalinity is  $250 \text{ mg/l}$  as  $\text{CaCO}_3$ . Then the carbonate hardness is

- A. 200
- B. 250
- C. 450
- D. 50

Ans. A

80. Which of the following do not represent direct health threat?

- A. Nitrate
- B. Fluorides
- C. Phosphates
- D. Sulphate

Ans. C

81. If waste is fairly biodegradable and can be effectively treated biologically, then
- |                         |                         |
|-------------------------|-------------------------|
| A. $BOD / COD = 0$      | B. $BOD = COD = 0$      |
| C. $BOD / COD \leq 0.2$ | D. $BOD / COD \geq 0.6$ |

Ans. D

82. Potassium dichromate is used for measuring
- |  |                     |
|--|---------------------|
| A. Oxygen equivalent of organic matter | B. Nitrogen content |
| C. Chloride content                    | D. Sulphide content |

Ans. A

83. For optimum digestion, C/N ratio of the material should be between
- |            |            |
|------------|------------|
| A. 10 – 30 | B. 20 – 40 |
| C. 30 – 50 | D. 40 – 60 |

Ans. C

84. Rainfall hyetograph shows the variation of \_\_\_\_\_.  
 A. Cumulative rainfall with time  
 B. Rainfall intensity with time  
 C. Rainfall depth over an area  
 D. Rainfall intensity with time cumulative rainfall

Ans. B

85. The number of unit hydrographs needed to produce S-curve is
- |                    |                    |
|--------------------|--------------------|
| A. $\frac{1}{D}$   | B. $\frac{T_B}{D}$ |
| C. $\frac{D}{T_B}$ | D. $T_B D$         |

Ans. B

86. Transpiration is measured by
- |                |                 |
|----------------|-----------------|
| A. Tensiometer | B. Phytometer   |
| C. Lysimeter   | D. Psychrometer |

Ans. B

87. A 6 hours storm had 6 cm of rainfall and the resulting direct runoff was 3 cm. If the  $\Phi$ -index remains at the same value, direct runoff due to 20 cm of rainfall in 12 hours in the catchment is
- |           |           |
|-----------|-----------|
| A. 120 mm | B. 130 mm |
| C. 140 mm | D. 150 mm |

Ans. C

88. For a catchment with an area of 600 km<sup>2</sup> the equilibrium discharge of an S-curve obtained by 6-hour unit hydrograph in m<sup>3</sup>/sec is
- |          |                      |
|----------|----------------------|
| A. 277.8 | B. 377.8             |
| C. 177.8 | D. None of the above |

Ans. A

89. The dickens formula for maximum flood discharge Q is

A.  $C_D A^{3/4}$

B.  $\frac{C_D}{A^{3/4}}$

C.  $C_D A^{1/2}$

D.  $\frac{C_D}{A^{1/4}}$

Ans. A

90. The intensity of the rainfall for successive 1 hours period of a 6 hours storm are 2, 6, 8, 9, 7 and 3 cm/hr. The runoff is 4 cm/hr. Calculate the  $\phi$ -index (cm/hr).

A. 2.5

B. 3.5

C. 4.6

D. 7.67

Ans. B

91. If the specific retention is 10 % and the specific yield of the 100 km<sup>2</sup> alluvial basin is 0.15. What is the porosity of the soil?

A. 0.25

B. 0.35

C. 0.15

D. 0.10

Ans. A

92. At Delhi, a maximum rainfall depth of 15 cm in 12 h has a return period of 50 years. The probability of a 12 h rainfall of magnitude equal to or greater than 15 cm will occur in the next year

A. 0.50

B. 0.33

C. 0.98

D. 0.02

Ans. D

93. If the initial infiltration capacity was 10 mm/hr and ultimate capacity was 1.2 mm/hr. The total of 33 mm of water infiltrated during 10 h interval. Find infiltration constant rate. ( Assume steady state is attained)

A.  $0.42 \text{ h}^{-1}$

B.  $0.36 \text{ h}^{-1}$

C.  $0.32 \text{ h}^{-1}$

D.  $0.27 \text{ h}^{-1}$

Ans. A

94. Calculate the runoff (cm) from a rainfall of 3 hours. The intensity of the rainfall is 2 cm/hr. The evaporation and infiltration losses are 8 mm and 16 mm respectively.

A. 1.2

B. 2.8

C. 3.6

D. 6.8

Ans. C

95. Available moisture is the difference in water content of soil between field capacity and \_\_\_\_\_.

A. gravitational water

B. permanent wilting point

C. saturation capacity

D. ultimate wilting point

Ans. B

96. The canal fall involving parabolic glacis is called as:

- A. Straight glacis fall
- B. Glacis fall
- C. Inglis fall
- D. Montague fall

Ans. D

97. Hydrodynamic pressure due to earthquake acts at a height of

- A.  $3H/4n$  above the base
- B.  $3H/4n$  below the water surface
- C.  $4H/3n$  above the base
- D.  $4H/3n$  below the water surface

Ans. C

98. The field capacity of a soil is 25%, its permanent wilting point is 15% and specific dry unit weight is 1.5. If the depth of root zone of a crop is 80 cm, the storage capacity of the soil is \_\_\_\_\_.

- A. 8 cm
- B. 10 cm
- C. 12 cm
- D. 14 cm

Ans. C

99. The field irrigation requirements is computed as \_\_\_\_\_.

- A. Consumptive use + field application losses
- B. Net irrigation requirement + field application losses
- C. Net irrigation requirement + conveyance losses
- D. Consumptive use + conveyance losses

Ans. B

100. A 60% index of wetness means

- A. rain excess of 40%
- B. rain deficiency of 40%
- C. rain deficiency of 60%
- D. none of the above

Ans. B

101. The load on a hydel plant varies from a minimum of 10,000 kW to a maximum of 33,000 Kw. Two turbo-generators of capacities 22,000 kW each have been installed. The Utilization factor will be

- A. 0.65
- B. 0.44
- C. 0.75
- D. 0.33

Ans. C

102. If a drainage basin of 2 sq.km area has an axial length of 1 km, then the form factor of the basin will be,

- A. 6.0
- B. 4.0
- C. 2.0
- D. 1.0

Ans. C

103. Calculate the critical velocity (m/sec) of a channel using Kennedy's theory, if the depth of flow is 3m.

- A. 0.84
- B. 1.11
- C. 2.7
- D. 6

Ans. B



104. The intensity of irrigation means
- A. percentage of culturable command area to be irrigated annually
  - B. percentage of gross command area to be irrigated annually
  - C. percentage of the mean of culturable command area and the gross commanded area to be irrigated annually
  - D. total depth of water supplied by the number of waterings

Ans. A

105. A sprinkler irrigation system is suitable when
- A. the land gradient is steep and the soil is easily erodible
  - B. the soil is having low permeability
  - C. the water table is low
  - D. the crops to be grown have deep roots

Ans. A

106. Check flooding method of irrigation can be used for
- A. Less permeable soils.
  - B. More permeable soils.
  - C. Both more permeable and less permeable soils.
  - D. Rolling lands only.

Ans. C

107. Pitot tube is used to measure \_\_\_\_\_.

- |                        |                        |
|------------------------|------------------------|
| A. Discharge           | B. Average velocity    |
| C. Velocity at a point | D. Pressure at a point |

Ans. C

108. Calculate the kinematic viscosity (stoke) of the fluid, if the dynamic viscosity of fluid is 0.5 poise and specific gravity is 0.4?

- |         |        |
|---------|--------|
| A. 0.95 | B. 1   |
| C. 1.25 | D. 1.5 |

Ans. C

109. 92% of iceberg volume is below surface and only 8% is visible above surface, Find ( $\rho_{\text{iceberg}}$ ) density of iceberg if density of seawater ( $\rho_{\text{seawater}}$ ) is 1025 kg/m<sup>3</sup>?

- |                           |                          |
|---------------------------|--------------------------|
| A. 943 kg/m <sup>3</sup>  | B. 927 kg/m <sup>3</sup> |
| C. 1027 kg/m <sup>3</sup> | D. None of the above     |

Ans. A

110. In which of the following unit kinematic viscosity of fluid is measured?

- |         |                     |
|---------|---------------------|
| A. m/s  | B. m/s <sup>2</sup> |
| C. dyne | D. stokes           |

Ans. D

111. Euler's equation for motion of liquids is based on the assumption that the \_\_\_\_\_.  
A. flow across streamline  
B. flow takes place continuously  
C. flow is homogeneous, non-viscous and incompressible  
D. flow is turbulent

Ans. C

112. Which of the following fluids can be classified as non-Newtonian?  
A. Kerosene oil and Diesel oil  
B. Human blood and Toothpaste  
C. Diesel oil and Water  
D. Kerosene and Water

Ans. B

113. If the velocity gradient is given by  $\theta$  and dynamic viscosity of the fluid is given by  $\mu$ . What is the shear stress on the wall of the boundary layer in the direction of motion?  
A.  $\mu\theta$   
B.  $\mu + \theta$   
C.  $\mu/\theta$   
D.  $\theta/\mu$

Ans. A

114. If the stream function is  $\Psi = 3x^2 - 4y^2$ , Then what is the magnitude of velocity at point (2,2)?  
A. 12  
B. 20  
C. 40  
D. 16

Ans. B

115. The runaway speed of a turbine is \_\_\_\_\_.  
A. The actual running speed at design load  
B. The synchronous speed of the generator  
C. The speed attained by the turbine under no load condition  
D. The speed of the wheel when governor fails

Ans. C

116. A ship's model of scale 1:100 had a wave resistance of 1 N at its design speed. The corresponding wave resistance (in N) in prototype will be \_\_\_\_\_.  
A. 100  
B. 10000  
C. 1000000  
D. 1000

Ans. C

117. In the selection of turbine by specific speed or head, which one of the following statements is not correct?  
A. For specific speed 10-35, Kaplan turbines  
B. For specific speed 60-300, Francis turbines  
C. For head 60-250 m, Francis turbines  
D. For head above 300 m, Pelton wheel

Ans. A

